

## The effect of intellectual capital on competitive advantage: The mediating role of innovation

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### CHRONICLE

### ABSTRACT

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The aim of this study is to explore the impact of intellectual capital on the achievement of competitive advantage in organizations. It also aims to explore the mediating impact of innovation on the relationship between intellectual capital and the achievement of competitive advantage. To meet the study's goals, the researchers reviewed the relevant literature. The researchers also provide definitions for intellectual capital and innovation. They also identified the dimensions of intellectual capital (i.e. structural, human and relational capital). The study identified the types of innovation (incremental and radical innovation) and found that intellectual capital significantly influences on the achievement of competitive advantage. Moreover, the study found that innovation has a mediating influence on the relationship between intellectual capital and the achievement of a competitive advantage.

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## 1. Introduction

Intellectual capital has been receiving much attention recently. It consists of relational, human and structural capital. Also, it affects economic growth (Abualoush et al., 2018). Intellectual capital participates in achieving competitive advantage (CA) for knowledge organizations (Chahal and Bakshi, 2014). In addition, intellectual capital is a value driver that transforms production resources into valuable assets (Kanaan et al., 2020). The organizations that utilize valuable human resources and capabilities effectively have better probabilities to achieve a competitive position (Barney, 1991). There's a relationship existing between the utilization of organizational resources and the achievement of CA (Newbert, 2008). Organizational resources include tangible and intangible resources (Hunaiti et al., 2009; Masa'deh et al., 2013; Wheelen et al., 2015; Abu Zayyad et al., 2020). Possessing intangible resources and capabilities shall enhance the capability to exploit the market opportunities (Al-Dhuhouri et al., 2020; Al Khayyal et al., 2020; Alameeri et al., 2020). That will achieve and sustain CA (Chahal & Bakshi, 2015; Alkitbi et al., 2020; Alyammahi et al., 2020). Regarding the intellectual capital, it is a knowledge asset (Al Mehrez et al., 2020; Alsuwaidi et al., 2020). CA can't be sustained, unless assets are utilized effectively and efficiently (Porter, 2008; Al Suwaidi et al., 2020; Alshamsi et al., 2020). According to Saengon (2020), knowledge is the predictor of innovation. Organizational innovation affects several organizational outcomes. Subramaniam and Youndt (2005) suggested

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that the interrelationship between the aspects of intellectual capital significantly affects organizational innovation. Jung et al. (2014) add that innovation can significantly affect the sustainability of the CA. The organizations that possess knowledge and creativity have more probabilities to show innovation and sustain their CA (Grimaldi et al., 2012). Chahal and Bakshi (2015) claimed that intellectual capital has a significant influence on the achievement of CA. They add that innovation has a mediating impact on the relationship existing between intellectual capital and the achievement of CA. The present study aims to explore the relationship existing between the intellectual capital, and the achievement of CA. It also aims to explore the mediating impacts of innovation on the latter relationship.

## **2. Background and Hypotheses**

### *2.1 Introduction*

Today, sustainable CA has been receiving much attention. A good competitive position can be reached through utilizing the firm's tangible and intangible resources effectively. Having valuable intellectual capital enables organization to achieve CA (Chahal & Bakshi, 2015).

### *2.2 Intellectual Capital*

Intellectual capital of employees consists of employees' knowledge, experience, and skills. Intellectual capital of organization consists of databases, culture, philosophy and system. In general, intellectual capital involves knowledge assets that can generate profits (Sullivan, 2000) and improve competitiveness (Marr, 2004). Furthermore, it consists of technological capabilities, skills and professional knowledge (Liu et al., 2020). In addition, intellectual capital adds value to the firm and plays a role in achieving CA. Furthermore, Intellectual capital is the most effective competitive weapon impacting the performance of Innovation in an organization (Alrowwad et al., 2020). The financial crisis of 2007 and the shortened product life cycle led organizations to provide more attention to the effective utilization of intellectual capital in order to meet the market demands. The latter capital involves human capital (like: skills, experience, competencies, and knowledge), structural capital (e.g. organizational processes, business processes, software, & databases), & relational capital (e.g. customers, suppliers, creditors, investors, and other stakeholders) and adds value to the organization (Rodrigues et al., 2017), also it improves organizational performance (Ode and Ayavoo, 2020).

#### *2.2.2 Dimensions of Intellectual Capital*

##### *2.2.2.1 Human Capital*

The intellectual capital of an entrepreneur is related to their level of education, their knowledge of how to start a business, and also any prior entrepreneurial experience (Montañés and Medina-Garrido, 2020). Also, human capital is the organizational knowledge owned by employees. It affects the achievement of CA (Mehralian et al., 2013). It involves the knowledge, experience, and capabilities that employees bring to the organization. Also, human capital is associated with the employee's factors, such as motivation, commitment, and skill (Lo and Chen, 2020).

##### *2.2.2.2 Structural (or organization) Capital*

Structural capital involves the organization's mechanisms and structures that enhance the innovative abilities of the organization. It stays within the firm even if the employees' services were terminated (Edvinsson & Malone, 1997). It refers to the non-human warehouses (e.g. databases, organizational structure, work manuals, strategies, and procedures). Also, structural capital involves culture, policies, databases, information systems, patents, copyrights, and etc. (Sharabati et al., 2013).

##### *2.2.2.3 Relational Capital*

Previous study has defined relational capital as the knowledge that was generated through the communication between employees and external stakeholders (Al-Khalil et al., 2014; Al Kurdi et al., 2020; AlShehhi et al., 2020; Kurdi et al., 2020). It involves a set of social resources (e.g. relationships, values and norms) and adds a value to the organization (Alshurideh, 2019; Almazrouei et al., 2020; Alshurideh et al., 2020).

### *2.3 Innovation*

Innovation refers to the ability to present new product, or service, or develop a new organizational structure or administrative system (Damanpour, 1991). It refers to carrying out new processes and providing new products to provide stakeholders with a distinguished value. It significantly affects the organizational agility level. Innovation refers to the generation of new ideas which provide the organization along with its stakeholders an additional value. In addition, Innovation performance can be indicated by 'R&D inputs, improve work methods, patent counts, new product announcements', and patent citations (Patky and Pandey, 2020; Boh et al., 2020).

Innovation aims at making radical changes in the organization to produce better services or goods, and develop the existent processes (O'Sullivan and Dooley, 2008). Innovation tends to adopt a new ideas, programs, or policies or carrying out new behaviors or processes in an organization (Mothe & Uyen, 2010). Innovation can significantly affect business success. Moreover, it affects productivity and the number of available job opportunities and driver the economic success and growth (Abuhashesh et al., 2019a).

### *2.3.1 Dimensions of Innovation*

#### *2.3.1.1 Incremental Innovation*

Incremental innovation leads to improving the organizational performance day by day and the minor developments or changes of the existent products, services, technologies, or approaches (Lee, 2011). It focuses on minor amendments made to the existent products, services, or technologies. However, radical innovation is the one that enables organizations to outperform their competitors (Johnson et al., 2016).

#### *2.3.1.2 Radical Innovation*

Survival in a competitive environment requires inventing new technologies, products, or services and carrying out new processes. That requires making a radical innovation and adapting quickly to the changes in the business environment (Stanley, 2012). The radical one involves major transformation made to the existent products, services, or technologies. It involves the entity's capacity to offer products or services which are new and completely different from the existent products and services and add value to them. From the customers' perspective, the radical innovation involves major amendments which provide customers with more benefits. From the organizations' perspective, the latter innovation involves major changes made to services or technologies for enhancing competitiveness.

### *2.4 Competitive Advantage (CA)*

The literature addressing CA pays little attention to the provision of comprehensive definition for CA. Barney (1991) defines it as the development of a strategy that adds a value that hasn't been added by competitors. He adds that sustainable CA is achieved when the organization adds a value that can't be duplicated nor imitated by competitors. Ma (2004) defines CA as a set of financial and physical resources that are effectively utilized. Cravens and Piercy (2009) defines CA as the weapon that provides the firm with the ability to handle its competitors effectively. CA as the organizational distinctive performance that outperform the competitors in the same industry. Sudrajat (2015) adds that CA involves designing and implementing a value-adding strategy that can't be implemented by competitors.

#### *2.4.2 Dimensions of CA*

The organization shall achieve CA when it possesses resources that are rare, valuable, and imperfectly imitable (Johnson et al., 2016). The achievement of CA of an organization is attributed to the distinctiveness of its capabilities. Capabilities –in this context- refers to the abilities of the organization to improve its CA on the long-term (Winter, 2014). The two main components of strategic capabilities are competence and resources (Wheelen et al., 2015). Resources refer to the organizational assets, whereas competence is the effective utilization of the organizational resources. When the organization outperforms its competitors in terms of competency, such a competence is called distinctive competences (Brady and Capell, 2004).

##### *2.4.2.1 Value*

Competences are considered valuable; in case they enable the organization to develop products or services that offer customers additional value. They are considered valuable, in case they enable the organization to generate higher revenues or reduce the costs (Johnson et al., 2016). Thus, valuable competences have several features: the first one is enabling the organization to utilize opportunities and avoid risks. Secondly, valuable competences should be considered valuable from the customers' perspective. Third; they should enable the organization to generate higher revenues and reduce the costs (Hesterly and Barney, 2010). Each organization should explore how valuable its competences are. That's because valuable competences enable the organization to achieve CA and offer customers additional value (Abuhashesh et al., 2019b).

##### *2.4.2.2 Rarity*

It's unlikely for the competences that are possessed by other competitors to provide the organization with CA (Johnson et al., 2016). Therefore, the organization must own rare competences. Szymaniec-Mlicka (2014) defines rare competences as competences that are owned by one organization or few ones only. If the competence is owned by few organizations, it shall be valued by customers (Barney, 1991).

##### *2.4.2.3 Inimitability*

Having competences that are valuable and rare shall enable firms to achieve CA. However, having such competences may not be enough. In other words, an organization should seek acquiring competences that are inimitable. Inimitable competences

refer to the competences which substitution, imitation or acquisition is considered costly and very hard for competitors (Newbert, 2008). Hesterly and Barney (2010) added that the barriers to such imitation are attributed to the unique relationships between actions, skills and employees. Therefore, such relationships make it difficult for competitors to imitate the organizational competences (Johnson et al., 2016). The organization should seek exploring whether its competences are considered costly to imitate by competitors (Wheelen et al., 2015).

#### *2.4.2.4 Organizational Support*

Providing customers with a value and acquiring competences that are rare and difficult to imitate shall improve competitiveness (Johnson et al., 2016). However, the organization should be concerned in achieving CA. Therefore, it should seek developing its strategic competencies. Teece, et al. (2016) define the organizational support as a set of formal and informal processes and functions carried out by the organization for supporting its strategic competences in the aim of achieving CA. The organization's formal and informal functions play a significant role in protecting its strategic assets. Each organization should exploit its competences effectively (Wheelen et al., 2015).

### *2.5 Intellectual Capital & Competitive Advantage*

Scholars have been providing much attention to examining the relationship existing between CA and intellectual capital. Chen (2008) aimed to explore the relationship between intellectual capital and CA in firms. He adds that the occurrence of consecutive changes in the market shall dramatically increase the industrial competition. Chen (2008) added that organizations must seek improving their image, productivity, and reputation. He also added that having a novel green intellectual capital is necessary for achieving CA. Green intellectual capital consists of relational, human and structural capital that are green. Regarding the human capital that's green, it consists of employees' knowledge, skills, attitudes, ethics, commitments that simulate green behavior. Green innovation provides firms with support needed for achieving CA (Chen, 2008). A survey was employed. The regression analysis was conducted. It was found that the three dimensions of the green intellectual capital have a positive influence on the achievement of CA in companies. However, the one that shows that strongest influence is the green relational capital (Chen, 2008). Some researcher aimed to address the relationship existing between CA & intellectual capital. For instance, Kamukama et al. (2011) aimed to explore the relationship existing between intellectual capital from one hand and the financial performance from another hand. They also aimed to explore the mediating impact of the CA on the latter relationship. They targeted the microfinance organizations located in Uganda. It was concluded that intellectual capital is capable of improving financial performance. They found that having intellectual capital shall enable firms to achieve CA. They found that achieving a sustainable CA shall enable the company to raise its financial performance (Hwang et al., 2020). It was concluded that intellectual capital positively affects the achievement of CA. The latter capital was measured by: (structural, human, and relational capital). They recommend conducting similar studies with adopting a longitudinal approach to enhance the reliability of the results. They recommend conducting similar studies with using other methods, such as: the interview method (Kamukama et al., 2011). Chahal and Bakshi (2015) aimed to investigate the relationship existing between intellectual capital and achieving CA. They also aimed to investigate the mediating impact of innovation and organizational learning on the relationship existing between intellectual capital and the achievement of CA. They used the relevant statistical methods. It was found that a significant positive relationship exists between intellectual capital and the achievement of CA. It was found that innovation and organizational learning have a significant mediating impact on the relationship existing between intellectual capital and achieving CA (Chahal & Bakshi, 2015). Yaseen et al. (2016) aimed to explore the influence of intellectual capital on the achievement of CA in the telecommunication Jordanian sector (Abuhashesh, 2019a, b). They used a questionnaire for collecting the relevant data. They targeted the telecommunication sector in Jordan. They conducted the multiple regression analysis. It was found that relational and structural capital positively influence the achievement of CA. They found that human capital does not have a significant influence on the achievement of CA. For the purposes of the current study, the bellow hypotheses were formulated:

**H<sub>01</sub>:** Intellectual Capital has no statistical effect on Competitive Advantage.

**H<sub>01.1</sub>:** Human Capital has no statistical effect on Competitive Advantage.

**H<sub>01.2</sub>:** Structural Capital has no statistical effect on Competitive Advantage.

**H<sub>01.3</sub>:** Relational Capital has no statistical effect on Competitive Advantage.

### *2.6 Intellectual Capital & Innovation*

Many researchers provide much attention to the impact of knowledge capital on carrying out innovation process effectively. Many researchers provided much attention to the impacts of intellectual capital on the innovation processes. Such impacts must be explored by researchers in order to carry out effective innovation management activities in organizations (Duodu & Rowlinson, 2016). Al-Khalil et al. (2014) aimed to investigate the influence of intellectual capital on the technical innovative abilities of banks. They targeted the Jordanian banking sector. They suggested that the increasing attention given to intellectual capital might be attributed to the fact that organizations want to achieve success through innovation. They added that the effective exploitation of intellectual capital shall enhance the innovative abilities of banks Al-Khalil et al. (2014) used a questionnaire in order to collect the relevant data. The population consists from all the Jordanian banks (including foreign and

national banks). It consists from twenty-six (26) banks that operate in Jordan. The validity and reliability of the instruments were measured. Means and standard deviations were calculated. Al-Khalil et al. (2014) conducted the multiple regression analysis. It was found that intellectual capital significantly affected the technical innovative abilities in the Jordanian banking sector. The latter capital is measured by human & organizational capital (Al-Khalil et al., 2014; Aldaas et al., 2019). Al-Khalil et al. (2014) recommend conducting more investments by Jordanian banks in order to improve their human and organizational capital. That shall participate in improving competitiveness. Al-Khalil et al. (2014) suggests that Jordanian banks should establish stronger relationships with their external stakeholders (Abuhashesh, 2019c, d). Researchers have conducted several studies about the nature of the relationship existing between intellectual capital and innovation. For instance, Agostini et al. (2017) aimed to shed a light on the relationship existing between intellectual capital and innovation in (SMEs). They measured innovation by radical and incremental innovation. The study of Agostini et al. (2017) is considered significant because the studies that address this relationship in SMEs are scarce. It's significant because it measured innovation by two types of innovation. They hypothesized that the effective utilization of intellectual capital shall enhance the incremental and radical innovative abilities. It was found that intellectual capital positively influences radical and incremental innovation in SMEs. Thus, it was found that intellectual capital positively influences innovation and innovative capabilities in SMEs. It was found that intellectual capital shall enable SMEs to meet their strategic goals. Also, previous research found that intellectual capital can significantly enable the organization to set effective guidelines that regulate the management practices. In order for organizations to be creative and innovative, they must provide much attention to intellectual capital and innovation. They must also provide much attention to innovation & intellectual capital. In addition, improving the innovative abilities shall enable the organization to achieve the sought outcomes. It shall enable organizations to achieve sustainable CA and show a better organizational performance.

For the purposes of the current study; these hypotheses were developed:

**H<sub>02</sub>:** Intellectual Capital has no statistical effect on Innovation.

**H<sub>02.1</sub>:** Human Capital has no statistical effect on Innovation.

**H<sub>02.2</sub>:** Structural Capital has no statistical effect on Innovation.

**H<sub>02.3</sub>:** Relational Capital has no statistical effect on Innovation.

### *2.7 Innovation & Competitive Advantage*

Based on many studies, innovation plays a significant role in achieving CA. In addition, researchers and professionals have been exerting much effort to examine the relationship existing between organizational innovativeness and CA. Aziz and Samad (2016) aimed to explore the relationship between innovation and achievement of CA. They aimed to identify the mediating impact of firm age on the latter relationship. They targeted (SMEs) operating in the food manufacturing sector in Malaysia. They used the random sampling method. They also used a questionnaire for collecting data. They used descriptive and inferential statistical methods. It was found that innovation significantly and positively influence the achievement of CA in (SMEs) operating in the latter sector. It was found that 73.5% of the changes that occurred to the CA are attributed to innovation. Thus, the latter SMEs must be innovative to achieve CA. they found that the firm age has a moderating impact on the relationship existing between the achievement of CA and innovation. The findings of the study of Aziz and Samad (2016) shall enable the latter SMEs to carry out innovative activities. Such activities shall improve the competitive position of these SMEs in the marketplace. Business intelligence refers to the processes of gathering, processing, and documenting information that can be used by employees for sustaining the competitive position of the organization. The knowledge sharing process provides the organization with resources that are unique, non-substitutable, inimitable and valuable. Several researchers sought investigating the relationship existing between innovation and the achievement of CA. For instance, Nanath and Pillai (2017) aimed to identify the relationship existing between information system (IS) and the achievement of CA. They aimed to identify the mediating impact of innovation on the relationship between Information System (IS) and the achievement of CA. Nanath and Pillai (2017) found that information System (IS) plays a significant role in achieving CA. They found that innovation has a mediating impact on the relationship between information system (IS) and the achievement of CA. These results were concluded through conducting a regression analysis. Nanath and Pillai (2017) recommend developing effective information systems (IS) that encourage employees to be innovative. For the purposes of the current study, hypotheses were formulated:

**H<sub>03</sub>:** Innovation has no statistical effect on Competitive Advantage.

**H<sub>03.1</sub>:** Incremental Innovation has no statistical effect on Competitive Advantage.

**H<sub>03.2</sub>:** Radical Innovation has no statistical effect on Competitive Advantage.

### *2.8 Intellectual Capital, Innovation, & Competitive Advantage*

The researchers provide definitions for intellectual capital and innovation. we identify the dimensions of intellectual capital (i.e. structural, human and relational capital). Also, the research identifies the types of innovation (incremental and radical innovation). It was found that intellectual capital significantly influences on the achievement of CA. It was found that innovation has a mediating influence on the relationship between intellectual capital and the achievement of CA. Therefore, the

researchers believe that employees in organizations must be encouraged to be innovative. We also believe that the management in organizations must seek recruiting employees who are highly qualified and possess distinguished expertise in order to achieve CA. For the purposes of the current study, the bellow hypothesis was formulated:

**H<sub>04</sub>:** The effect of Intellectual capital on Competitive advantage is not statistically mediated through Innovation.

### 3. Methodology

#### 3.1 Theoretical Framework

As mentioned earlier, this study aims to investigate the mediating role of organizational innovation in the relationship between intellectual capital and competitive advantage. The research model was built on the basis of a previous literature review and is presented in Fig. 1. Organizations own a various number of resources that can influence their operations. These resources can be either tangible or intangible assets that may have a direct or indirect effect on the firms' competitiveness (Omerzel & Gulev, 2011). Intellectual capital as intangible assets or knowledge assets is generated through the combination and exchange of intellectual resources that might be presented as explicit or implicit knowledge within the organization.

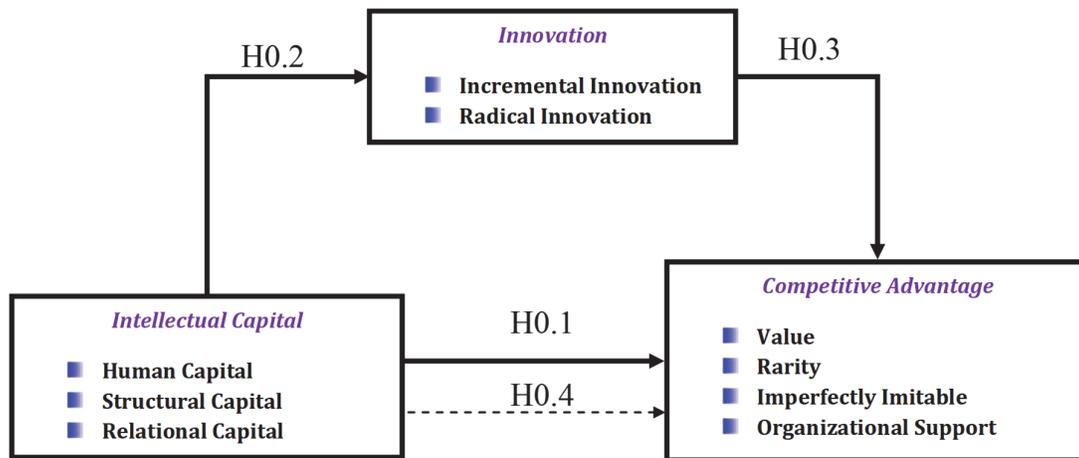


Fig. 1. Research Model

#### 3.2 Population and Sample

The population of this study consists of all employees at all managerial levels working in the three major telecommunication companies operating in Jordan (Orange, Zain, Umniah). As per to the annual reports of these companies at the end of 2019, it has been reported that the total number of employees working in the telecommunication companies was 3119 employees (TRC, 2019). The entire population of the study is 3119. Accordingly, the sample size for the study is 342 as suggested by Sekaran and Bougie (2016).

#### 3.3 Statistical Analysis

This research used the Statistical Package for social science (SPSS) and the Analysis of Moment Structure (AMOS) to examine the data gathered for this study. Testing study hypotheses requires determining the appropriate statistical methods (Sekaran & Bougie, 2016). Moreover, determining the appropriate statistical methods rely on the number of study variables.

##### 3.3.1 Reliability

**Table 1**

Cronbach's alpha of the main variables

Dimension	Number of Items	Cronbach's Alpha Values
Intellectual Capital	15	.964
Innovation	6	.911
Competitive Advantage	6	.943

Clearly, the Cronbach's Alpha Values for the main variables are higher than 0.6 which prove a high level of reliability (Hair et al., 2010). The following table presents the Cronbach's Alpha Values for the major dimensions of the study variables:

**Table 2**  
Reliability statistics

Study Construct	Number of Items	Cronbach's Alpha Values
<b>Intellectual Capital</b>	<b>15</b>	.964
Human Capital	5	0.922
Structural Capital	5	0.909
Relational Capital	5	0.933
<b>Innovation</b>	<b>6</b>	.911
Incremental Innovation	3	0.934
Radical Innovation	3	0.842
<b>Competitive Advantage</b>	<b>6</b>	.943
All Variables	6	0.974

## 4. Data Analysis

### 4.1 Introduction

Much of recent studies were conducted to investigate the impact of intellectual capital on the organizational performance. However, few studies analyzed the influence of intellectual capital on achieving a competitive advantage. The contribution of this study is that it will investigate the mediating effect of innovation on the relationship between intellectual capital and Competitive advantage. Furthermore, this study aims to introduce additional evidence that intellectual capital through its main dimensions: human capital, structural capital, and relational capital enhances the chance of obtaining a competitive advantage through the adoption of Innovation. The study stands on a strong theoretical framework and methodology.

#### *Intellectual Capital and Competitive Advantage*

- H<sub>01</sub>**: Intellectual Capital has no statistical effect on Competitive Advantage.  
**H<sub>01.1</sub>**: Human Capital has no statistical effect on Competitive Advantage.  
**H<sub>01.2</sub>**: Structural Capital has no statistical effect on Competitive Advantage.  
**H<sub>01.3</sub>**: Relational Capital has no statistical effect on Competitive Advantage.

**Table 3**  
Multiple regression of the first hypotheses

	t	Sig	Beta
<b>Constant</b>	1.496	0.136	0.260
<b>Human Capital</b>	2.519	0.012	0.192
<b>Structural Capital</b>	4.394	0.000	0.360
<b>Relational Capital</b>	5.325	0.000	0.361

Competitive advantage is the dependent variable  $R = 0.77$   $R^2 = 0.593$  Adjusted  $R^2 = 0.590$  F-value = 160.929 (Sig. = 0.000)

Further to the above table, it can be noticed that the multiple correlation coefficient R is (0.770). This indicates a positive correlation between intellectual capital and competitive advantage. The coefficient of determination  $R^2$  is (0.593). This value presents that the tripod of intellectual capital explained 59.3% of the variation in competitive advantage. Moreover, it is evident that the adjusted  $R^2$  is (.590). If the adjusted  $R^2$  is subtracted from  $R^2$  ( $0.593 - 0.590$ ) = 0.003. This little shrinking (0.003) proves that if the model has been fitted when the whole population participates in the study, the higher possible variance would be (0.003). The probability of F-Value (160.929) refers to the association among human capital, structural capital, and relational capital. This association has a significant effect on competitive advantage at ( $\alpha \leq 0.05$ ). Accordingly, the first main hypothesis is rejected. Regarding the effect of human capital on competitive advantage, it is evident from the previous table that significant value of human capital at ( $\alpha \leq 0.05$ ) is (0.012). The t-calculated is (2.519) is greater than the value of t-tabulated (1.96). This proves that the human capital has a remarkable effect on competitive advantage. Therefore, the null hypothesis is rejected at ( $\alpha \leq 0.05$ ). As for the structural capital, it can be observed that structural capital has significant value of (0.000) at ( $\alpha \leq 0.05$ ). The t-calculated is (4.394) and significantly greater than the value of t-tabulated (1.96). Based on these findings. Accordingly, the null hypothesis is rejected. Indeed, it can be argued that documenting the organizational knowledge and promoting effective culture and work system would enhance the ability to acquire a competitive advantage in the telecommunication companies. In terms of relational capital, the previous table shows that relational capital has significant value of (0.000) at ( $\alpha \leq 0.05$ ). The value of t-calculated is (5.325) is greater than (1.96). Building on these finding, the null hypothesis is rejected. In general, enhancing the collaboration among employees to exchange ideas and build two-way communication channels to obtain clients' feedback would promote the ability of telecommunication companies to occupy a competitive position.

#### *Intellectual Capital and Innovation*

- H<sub>02</sub>**: Intellectual Capital has no statistical effect on Innovation.  
**H<sub>02.1</sub>**: Human Capital has no statistical effect on Innovation.  
**H<sub>02.2</sub>**: Structural Capital has no statistical effect on Innovation.  
**H<sub>02.3</sub>**: Relational Capital has no statistical effect on Innovation.

**Table 4**  
Multiple regression of the second hypotheses

Variables	t	Sig	Beta
Constant	4.623	0.000	0.642
Human Capital	0.623	0.533	0.038
Structural Capital	4.484	0.000	0.294
Relational Capital	8.955	0.000	0.486

Innovation is the dependent variable,  $R = 0.812$   $R^2 = 0.659$  Adjusted  $R^2 = 0.656$  F-value = 160.929 (Sig. = 0.000)

Noticeably the multiple correlation coefficient  $R$  is (0.812). Therefore, a positive linkage between intellectual capital and organizational innovation is established. The coefficient of determination  $R^2$  is (0.659). This value presents the amount of variation that is explained through the combination of human capital, structural capital, and relational capital. The value of adjusted  $R^2$  is (0.656) which supports the model fitness with the entire population where the difference between  $R^2$  and the adjusted  $R^2$  is (0.003). The combination of human capital, social capital, and structural capital has a substantial effect on innovation at ( $\alpha \leq 0.05$ ). Therefore, the second main hypothesis is rejected. As for the sub-hypotheses, the previous table shows that the significant value of human capital is (0.533). This value is not significant at ( $\alpha \leq 0.05$ ). Furthermore, the t-calculated of human capital is (0.623) and lower than the value of t-tabulated (1.96). This indicates that human capital has no significant effect on organizational innovation at ( $\alpha \leq 0.05$ ). Accordingly, the null hypothesis is accepted. However, it has been claimed that the components of intellectual capital are interlinked (Chahal & Bakshi, 2015). To test this argument, the researchers tend to examine the effect of human capital without considering the other two components of intellectual capital. The following table presents the results of estimating the relationship between human capital and innovation:

**Table 5**  
The statistical analysis for the effect of human capital on innovation

Variables	t	Sig	Beta
Constant	6.872	0.000	1.136
Human Capital	17.258	0.000	0.690

Innovation is the dependent variable  $R = 0.687$   $R^2 = 0.472$  Adjusted  $R^2 = 0.471$  F-value = 297.828 (Sig. = 0.000)

Clearly, human capital has a significant value of (0.000) at ( $\alpha \leq 0.05$ ). The value of t-calculated is significantly greater than the value of t-tabulated. Therefore, it can be argued that the components of intellectual capital are interrelated where the presence of one variable can influence on another variable. In fact, it has been posited that human capital can indirectly influence on other variables as it is embedded in the relational capital (Yaseen et al., 2016). However, it is proposed that further analysis and suggestions are needed to draw a clear image regarding this issue. Regarding the second-sub hypothesis, it has been found that the significant value of structural capital is (0.000). This value is significant at ( $\alpha \leq 0.05$ ). The value of t-calculated for structural capital is (4.484). This value is remarkably greater than the value of t-tabulated (1.96). Based on this, the researcher rejects the null hypothesis and accepts the alternate hypothesis. Further, this is an indicator that the business processes and work procedures in the telecommunication companies have a substantial role in promoting the organizational innovation. Relational capital has a significant value of (0.0000 at  $\alpha \leq 0.05$ ). The value of t-calculated is (8.955). This value is significantly greater than the value of t-tabulated (1.96). Therefore, the researcher rejects the null hypothesis. In a narrower context, it can be concluded that building solid ties within and outside the company would enhance the innovative capabilities in the telecommunication companies. Furthermore, sharing information between employees to generate new ideas may help companies to create innovative products and services.

### *Innovation and Competitive Advantage*

**H<sub>03</sub>**: Innovation has no statistical effect on Competitive Advantage.

**H<sub>03.1</sub>**: Incremental Innovation has no statistical effect on Competitive Advantage.

**H<sub>03.2</sub>**: Radical Innovation has no statistical effect on Competitive Advantage.

**Table 6**  
Multiple regression of the third hypotheses

Variables	t	Sig	Beta
Constant	3.077	0.002	0.513
Incremental Innovation	10.804	0.000	0.584
Radical Innovation	5.324	0.000	0.279

Competitive advantage is the dependent variable  $R = 0.756$   $R^2 = 0.572$  Adjusted  $R^2 = 0.570$  F-value = 222.108 (Sig. = 0.000)

Statistically speaking, the multiple correlation coefficient  $R$  is (0.756). This ratio demonstrates a positive relationship between organizational innovation and competitive advantage. The coefficient of determination  $R^2$  is (0.572). This ratio means that innovation as consists of incremental and radical innovation explained (57.2%) of the variation in the competitive advantage. Adjusted  $R^2$  is (0.570). The difference between  $R^2$  and adjusted  $R^2$  is (0.002) which means that the model has been fitted with the entire population. Finally, the combination between incremental and radical innovation has a probability of F-Value (222.108). This is a proof that innovation has a significant effect on competitive advantage at ( $\alpha \leq 0.05$ ). Accordingly, the

researcher tends to reject the third main hypothesis and accept the alternate hypothesis. Noticeably the incremental innovation has a significant value of (0.000) at ( $\alpha \leq 0.05$ ). As well as, the value of t-calculated is (10.804). This value is greater than the value of t-tabulated. Thus, the null hypothesis will be rejected. In fact, the telecommunication companies in Jordan understand the importance of enforcing the innovative capabilities to produce new products and services. In addition, their constant attempts to accommodate to changes taking place in the business environment are remarkably observed. Previous table shows that the radical innovation has a significant value of (0.000) at ( $\alpha \leq 0.05$ ). The value of t-calculated is (5.324) and significantly greater than the t-tabulated (1.96). Accordingly, the researcher would reject the null hypothesis and accept the alternate hypothesis. Practically, the telecommunication industry in Jordan is characterized by high level of competition. This is can be seen in the bold attempts to quickly promote prevailing products and services.

**H<sub>04</sub>:** The effect of Intellectual capital on Competitive advantage is not statistically mediated through Innovation.

To investigate the mediating role of innovation in the relationship between intellectual capital and competitive advantage, testing mediation with regression analysis will be adapted as proposed by Baron and Kenny (1986). Testing the mediating role passed through two stages. First, the direct impact of intellectual on competitive advantage in the absence of innovation will be examined. Second, the indirect impact of intellectual capital on competitive advantage in the presence of innovation will be examined. To better understanding, the influence of intellectual capital on competitive advantage will be examined in the absence of innovation. This influence should be statistically significant. At that time, the influence of intellectual on competitive advantage will be examined in the existence of innovation. To determine mediation effect, once the influence of intellectual capital on competitive advantage is significantly reduced, innovation fully mediates the relationship between intellectual capital and competitive advantage. On the other hand, if the influence of intellectual capital is reduced but insignificantly. Thus, innovation partially mediates the relationship between intellectual capital and competitive advantage. The effect of intellectual capital on competitive advantage is statistically clarified below:

**Table 7**  
**The path analysis of intellectual capital, innovation, and competitive advantage**

<b>Intellectual Capital → Innovation (Path A)</b>				
	Coefficient	SE	t	P
<b>Innovation</b>	.8329	.346	24.0805	.0000
<b>Innovation → Competitive Advantage (Path B)</b>				
<b>Innovation</b>	.4268	.624	6.8425	.0000
<b>Intellectual Capital → Competitive Advantage (Path C)</b>				
<b>Intellectual Capital</b>	.9198	.0420	21.9038	.0000
<b>Intellectual Capital → Innovation → Competitive Advantage (Path C')</b>				
<b>Intellectual Capital</b>	.5643	.0625	8.6567	.0000

Further to the previous table. It has been found that intellectual significantly effects on innovation where the coefficient value is (.8329). This can be noticed at Path (A). Regarding the linkage among innovation and competitive advantage, it can be claimed that innovation significantly effects on competitive advantage where the coefficient value is (.4268). This can be observed at Path (B). However, to determine whether innovation has a mediate the relationship between intellectual capital and competitive advantage, the following conditions must be met:

1. The effect of intellectual capital on competitive advantage must be significant
2. The strength of intellectual capital in predicting competitive advantage must be reduced.
3. The strength of intellectual capital in predicting competitive advantage must be significant in the existence of innovation.

Consequently, the previous table shows that intellectual capital has a significant influence on competitive advantage where the coefficient value is (.9198) as shown in (Path C). This relationship still significant but relatively reduced in the presence of innovation. Accordingly, it can be postulated that innovation partially mediates the relationship between intellectual capital and competitive advantage as seen in (Path C'). The following table summarizes the study model:

**Table 8**  
**The Model Summary**

<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F-Value</b>	<b>DF1</b>	<b>DF2</b>	<b>P</b>
.6409	.6388	296.3068	2.0000	332.0000	.0000

## 5. Discussion and Conclusions

### 5.1 Introduction

Research hypotheses were tested using the multiple regression analysis and Baron and Kenny (1986) mediation test. 12 hypotheses were developed in this study. Out of which, all main hypotheses were rejected, 7 sub-hypotheses were rejected, and 1 sub-hypothesis was accepted. Analyzing the data collected from 335 employees at all managerial levels working in the telecommunication sector reveals that intellectual capital significantly effect on the organizational ability in attaining a competitive advantage at ( $\alpha \leq 0.05$ ). This finding supported the conclusions of (e.g. Wu et al., 2008; and Yaseen et al., 2016).

Theoretically speaking, drawing on the RBV as suggested by Barney (1991), it has been stated that intellectual capital as a substantial intangible resource within an organization have a direct and indirect impact on enhancing the competitive position of the firm. Intellectual capital is considered as the combination and exchange of intellectual resources that can be presented either in an explicit or implicit knowledge (Wu et al., 2008). This knowledge is considered as the fundamental base in building a competitive advantage. Furthermore, RBV stressed that competitive advantage can be achieved through acquiring resources that are valuable, rare, imperfectly imitable, and organizational supported. Therefore, the organizational ability in integrating and creating a congruences among the intellectual component can help companies achieve competitive advantage in the telecommunication sector in Jordan. Regarding the tripod of intellectual capital, it has been found that human capital has a significant effect on achieving a competitive advantage at ( $\alpha \leq 0.05$ ). Indeed, this finding is supported by such scholars (e.g. Kamukama et al., 2011; Jaradat et al., 2012; Chahal and Bakshi, 2015). The premise behind this finding is that human capital comprises all business capabilities embedded in the individual and not owned by the organization (Wu et al., 2008). It is also the individual stock of an organization as represented by employees. In this context, human capital is associated with the innate ability, intelligence, creation and talent brainpower and considered as a core component of intellectual capital. Therefore, it is the main source in building a competitive advantage. As for the structural capital, it has been found that structural capital has a remarkable effect in enhancing the competitive position at ( $\alpha \leq 0.05$ ). This finding is supported the conclusion of such researchers (e.g. Kavida and Sivakoumar 2009). Structural capital includes the tacit knowledge or codified knowledge artifacts. It is considered ad the pool of knowledge and the supportive infrastructure that facilitates exploiting human and relational capital. Indeed, organizations with effective structural capital can find a better harmonization among the components of intellectual capital. Therefore, it can be postulated that enhancing the structural capital is useful to achieve a sustainable competitive advantage. It has also been found that relational capital has a significant influence on achieving a competitive advantage at ( $\alpha \leq 0.05$ ). This finding is highly consistent with the findings of such scholars as (e.g. Chen 2008; Jaradat et al., 2012) who argued that among the components of intellectual capital, relational capital is considered that most favorable and influential component in achieving a competitive advantage. At its core, relational capital is concerned with the mobilization of resources and knowledge through a social structure. Thus, it can be argued that building strong ties with all stakeholders' help achieving a competitive edge.

Remarkable efforts have been exerted to examine the linkage between intellectual capital and organizational innovation. This study has found that intellectual capital has a significant effect in promoting the innovation at ( $\alpha \leq 0.05$ ). This result is supported by other studies conducted by various scholars (e.g. Delgado-Verde et al. 2016). In general, it is widely accepted that the organizational ability to innovate is closely tied to its intellectual capital or its ability to utilize the knowledge resources (Subramaniam and Youndt, 2005). This is attributed to the organizational ability in conceptualizing the strategic importance of its intellectual resources as it provides a comprehensive understanding of both internal and external intellectual resources embedded in its employees, structure, or network relationships. Surprisingly and contrary to various studies, it has been found that human capital has no significant effect on innovation ( $\alpha \leq 0.05$ ). This finding is consistent with (Obeidat et al., 2017) who found that there is no linkage between intellectual capital and innovation. Indeed, this is can be attributed to such reasons. For instance, it is possible that the significant effect of structural capital and relational capital minimizes the role of human capital in shaping outcomes. Accordingly, it has been found that human capital without the presence of structural capital and relational capital has a significant influence on creating a climate of innovation ( $\alpha \leq 0.05$ ). it has also been found that structural capital remarkably promotes the presence of innovation within an organization ( $\alpha \leq 0.05$ ). It is considered that structural capital is an important driver toward the innovation as it concerned with cultivating the knowledge in databases, systems, or structures which facilitate the incremental and radical innovation. It is also considered that relational capital is a contributor of innovation as it associated with creating relationships that lead to capturing, balancing and adjustment of creativity and value that are vital for both incremental and radical innovation. In fact, competition in the business environment is unavoidable. For that, every single effort is always required to help organizations understand what is happening in the market, and what the customer wants. Therefore, to keep up with the business trends, organizations should shed the light on the importance of creating an innovative climate. In this study, it has been revealed that organizational innovation as it composed of incremental and radical innovation positively influences in attaining a competitive advantage at ( $\alpha \leq 0.05$ ). The result of this study is supported by several scholars (e.g. Rozalia et al. 2013; Schreiber et al., 2016). In a narrower business context, the existence of innovation in terms of incremental and radical innovation is basically to fulfill the market requirements and keep pace with the short product life cycle. Furthermore, it has been asserted that companies can attain a sustainable competitive advantage through developing competences that are characterized by the ability to reinforce the prevailing products and fundamentally change these prevailing products to respond for the customers' wants. Finally, it has been revealed that the relationship between intellectual capital and competitive advantage is partially mediated by the innovation at ( $\alpha \leq 0.05$ ). Indeed, this finding is relatively consistent with such scholars (Chahal & Bakshi, 2015). In words, it is through innovation an organization can develop new products and services which ultimately helps an organization in sustaining a superior position. However, building an innovative organization requires firms to heavily invest in enhancing the competences of its employees, formulating a healthy structure and document the knowledge, and strengthen the ties within the internal and external environment. Accordingly, it can be argued that it is also established that intellectual capital directly and significantly affects the competitive advantage and when innovation is introduced as a mediator in the relationship between intellectual capital and competitive advantage, it further improves the relationship.

## 5.2 Contribution of the Study

This research was built on previous literature regarding the role of intellectual capital in achieving a competitive advantage through the mediating effect of innovation. Indeed, the findings of this study have practical and theoretical contribution in a significant way. Practically speaking, researches were conducted in different countries with different cultures and different work settings. However, this study was conducted in Jordan as one of the developing countries as limited efforts have been exerted to study the nature of this relationship in developing countries. As well as, this research highlights the critical role of intellectual capital on competitive advantage through the mediating role of innovation in such intensive based-technology as the telecommunication sector. Theoretically speaking, the distinguishing feature of this study is the solid theoretical framework that built on a clear methodology. In other words, intellectual capital has been assessed using the most popular tripod of human, structural, and relational capital as suggested by as (Seleim and Khalil, 2011; Al-Khalil et al., 2014). This construct achieved a high degree of acceptance among researchers as it covers the concept of intellectual capital and enhances the parsimonies of the study. Another hallmark of this research is the use of innovation as a mediating variable to clarify the nature of relationship between intellectual capital and competitive advantage. Incremental and radical innovation were adapted to assess the organizational innovation as those two types of innovation cover other aspects as administrative and technical innovation. Finally, measuring the competitive advantage has been conducted building on RBV. Indeed, despite the numerous methods to assess the competitive advantage, all these methods heavily depend on this typology.

## 5.3 Limitations and Recommendations

Despite the remarkable importance of this study, it holds some limitations. These limitations should be acknowledged to help researchers fill the gaps. First, this study adopts the questionnaire the major instrument to collect data regarding intellectual capital, innovation, and competitive advantage. Indeed, every data collection method has its own built-in biases. As for the questionnaire, respondents may have overemphasized the positive aspect of intellectual capital, innovation, and competitive advantage. Therefore, it is recommended resorting to multimethod of data collection helps researchers to overcome these biases. Second, it has been observed that some respondents provide inconsistent and illogical answers in questionnaire. However, these respondents have been scientifically treated as suggested by Sekaran and Bougie (2016). Third, the current study employed cross-sectional survey design. The purpose of this design to collect data that would be pertinent to addressing the answer to research question. It is advised to adapt the longitudinal survey design in future studies. A longitudinal research can provide further insight on how individuals perceive intellectual capital, innovation, and competitive advantage at more than one time. It may also show other relationships among variable at different points of testing. Fourth, the sampling design chosen in this study may influence the generalizability of the findings. Convenience sampling is characterized by quick, and efficiency. However, this sampling design is the least reliable of all sampling designs regarding the generalizability. To overcome this limitation, it is recommended to use other probability sampling techniques as simple random or stratified random sampling to obtain more useful and generalized findings. Finally, this research was conducted in the Jordanian telecommunication sector as one of the most competitive sectors in Jordan. It is recommended to conduct this research in such sectors as the banking or pharmaceutical sectors. Also, it is advisable to represent the importance of this study by conducting this research at the country level. Theoretically speaking, the current study concentrates on the three dimensions of intellectual capital. Namely, human capital, structural capital, and relational capital. Other intellectual capital dimensions are recommended to be used in measuring the importance of intellectual capital. For instance, it is advisable to use organizational capital, innovation capital, customer capital, and process capital as suggested by Chahal and Bakshi (2015). This research also adapts the incremental and radical innovation to assess the organizational innovation. Indeed, future researchers can dig deeper into the role of innovation through using other classification as technical or administrative innovation. Moreover, the mediational effect of innovation in the relationship between intellectual capital and innovation can be applied in different industries to know whether innovation has fully, partially, or no mediation effect in other industries. As for the competitive advantage, it is recommended to adapt other measurement method as relying on the financial reports to determine the market share. Practically speaking, managers in the telecommunication companies should be aware about the importance of exploiting the intellectual resources as they have a crucial influence on attaining a competitive advantage. It is also important for the telecommunication companies to comprehend the vital role of intellectual capital in achieving a sustainable competitive advantage. Therefore, this puts on the shoulders of managers in the telecommunication companies a huge responsibility to improve performance by investing more resources in human capital, relational capital and structural capital. As well as, in a swiftly moving world, the telecommunication companies should encourage employees with the tacit or intangible knowledge that in their heads as it tremendously helps firms to create valuable goods and services. Finally, more efforts should be exerted toward adapting the innovative competences since innovation is considered as an important factor in determining the trajectories of companies all over the globe.

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