

## Intellectual Capital Development: A Case Study of Middle East University

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### ABSTRACT

The purpose of the study was to investigate the influence of Intellectual Capital (IC) on Middle East University's (MEU) Business Performance (BP), through examining the managers' perceptions regarding significance and potential use of IC indicators to leverage MEU's performance. The study surveyed academic and administrative staffs, as well as, Master and Bachelor students at MEU. Practical data were used in the empirical analysis collected from 167 participants out of 3217 elements, by means of a questionnaire. To confirm the suitability of data collection instrument, a Kolmogorov-Smirnov (K-S) test, Cronbach's Alpha and factor analysis were used. Statistical techniques such as descriptive statistics, t-test, ANOVA test, correlation, multiple regressions and stepwise regressions were employed. The results showed that the participants were almost similar in their preferences regarding HC, SC and RC, and they believe that MEU has low implementation regarding these three variables. The results also indicated a positive significant relationship between IC and MEU's BP. However, respondents believe that the RC has the highest effect on MEU's BP, followed by HC, while they do not believe that SC affects MEU's BP. Furthermore, empirical results indicated that there are strong inter-relationships and interactions among the three components of IC. The use of a single organization and/or single industry study design limits its generalisability to other organizations and/or industries. Extending the analyses to other settings represent future research opportunities. IC is an important source of organizations' wealth and therefore it should be taken into serious consideration when formulating the MEU's strategy. MEU should coordinate different perspectives of IC to improve MEU's BP and should assign scales for each of the three components of IC. The data suggest that a similar set of IC indicators could be developed for other organizations and industries whether government, public or private, profitable or non-profitable organizations.

**Keywords:** Intellectual Capital (IC), Human Capital (HC), Structural Capital (SC), Relational Capital (RC), Middle East University (MEU), Business Performance (BP)..

### INTRODUCTION

Although the concept of IC has been used for years, however, until now there is neither clear cut definition for it, nor an agreement upon its classification. Bontis (1999) stated: It is clear that the definition of IC is very

vague, and purposely so. Maevski (2003) said: Although the growing contribution of intellectual capital (IC) to economic growth and development is widely recognized, there are still difficulties experienced by governments, corporate sector, small and medium-sized enterprises, and finally intellectual property right holders in valuating and managing IC. Marr and Chatzkel (2004) added: IC as a concept is often poorly defined. Marr and Moustaghfir (2005) mentioned: The concept of IC is often ill-defined, and they said that the fuzziness of IC as a construct does not seem to decrease. Pitkanen (2006) elaborated: There is a lack of a homogenous view on how to define, classify and evaluate IC.

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**IC Definition:**

Roos and Roos (1997) defined IC as the sum of the hidden assets of the organization not fully captured on the balance sheet, and thus included both what is in the heads of organizational members, and what is left in the organization when they leave. Skandia (1998) described IC as the difference between the organization's market value and its book value. Bontis's questionnaire (1998) described IC as the difference between what an organization's market value is and the cost of replacing its assets. Zambon (2002) described IC as the knowledge that can be converted into profits. Moreover, Stewart (2003) defined IC as the sum of everything, everybody in an organization knows that gives it a competitive edge. Poyhonen and Smedlund (2004) stated that IC is produced by implementing and developing the intangible assets, knowledge and competencies already existing within the network, and by creating totally new intangible assets, knowledge and competencies. Lev (2007) stated that IC is the non-physical sources of value, generated by innovation, unique organizational designs, or human resource practices. Giegiel (2010) mentioned that IC consists of intangible assets of people, enterprises, societies, regions and institutions, which in case of appropriate use can be a value of present and future wealth creation. Herman (2010) defined IC as the key competences of employees, comprising individual knowledge and skills. Gabriela *et. al.* (2012) described IC as stocks and flows of knowledge available in an organization.

From the above definitions, IC can be described as: an organizational intangible asset; knowledge with potential for value or knowledge that can be used to create value; and human capital is the core of IC.

**IC Classification:**

As stated above, there is neither unified classification for IC nor an agreement upon its components. Skandia (1995) classified IC into HC and SC. SC is divided into

organizational capital and customer capital. Organizational capital, in turn, is divided into innovation capital and process capital. Roos & Roos (1997) divided IC as both what is in the heads of employees (HC) and what is left in the organization when people leave the organization (SC). Sveiby (1997) categorized IC into three parts: Internal structure, external structure and individual competence. Furthermore, Bontis (2001) classified IC into three components. HC: the tacit knowledge embedded in the minds of the employees. SC: The organizational routines of the business. RC: The knowledge embedded in the relationships established with the outside environment. Moreover, Stewart (2003) divided IC into HC, SC, and customer capital. Castro and Verde (2012) stated that there are four sets of IC indicators (HC, OC, RC and technological capital).

In summary, most of the academic papers written agreed upon that IC can be divided into three elements: Human capital (individual competences), structural (organizational or internal) capital and relational (customer or external) capital. The current study adopts this classification.

**Why Measure Intellectual Capital?**

During last decade, IC measurement and management have become a very crucial topic for all organizations, and whatever the business they do. This topic will become even more important in future, because the traditional accounting methods are not suitable for today's business environment. The purpose behind measuring IC is to understand how managers in these organizations manage to create value (competitive advantage).

Zambon (2002) concluded that there are many motives for management engaging in IC measurement. Malhotra (2003) stated that the reason for valuation and measurement of IC is to understand value lies in the organization. Marr *et. al.* (2003) identified five main reasons why organizations are seeking to measure IC to

help organizations formulate their strategy, to assess strategy execution, to assist in diversification and expansion decisions, to be used as a basis for compensation, and finally, to communicate measures to external stakeholders. Marr and Chatzkel (2004) identified three main categories of reasons why organizations measure their IC and bring them together under the following broad headings: Strategy; behavior; and external validation. Hunter *et. al.* (2005) stated that the purpose of IC measurement is to maximize organization performance. Bukowska and Zajac (2010) revealed that the IC control really means determining whether the capital allows the organization to achieve its strategic objectives. Liu (2011) said: Measuring IC can help to formulate business strategies and allocate business resources. Kasiewicz and Rogowski (2010) mentioned that there are three interrelated groups of arguments supporting the measurement of IC. The growing importance of IC as a determinant of company growth: only IC ensures lasting competitive advantage on the market: and IC is a constant and an inexhaustible source of innovations. Alizadeh (2012) pronounced that IC management helps the organizations to identify their capabilities, maintain and reconstruct them over time. Purgailis and Zaksas (2012) added that the IC identification and assessment can serve as the organization's internal management support tool. Vashishtha *et. al.* (2012) stated: Management of IC cannot be possible without measuring it. Finally Manzari *et. al.* (2012) specified: Every organization should select its appropriate IC definition and its indicators to measure it. Finally, Tajdari and Tehrani (2012) announced: IC has become more important in today's knowledge driven economies

From what has been discussed above, one can conclude that the IC should be measured for internal and external purposes, such as: 1) To make informed

decision and formulate effective strategies; 2) To assess strategy implementation; 3) To influence individual and organizational behavior; 4) To provide more accurate organization valuations; 5) It is an indicator for future productivity and profitability; 6) To leverage all IC elements to meet organization goals; 7) To be used as a basis for compensation and to incentivize the employee for value creation activities; 8) To maintain high state of innovation and creativity; 9) To increase annual alliances, licensing and agreements; 10) To enhance negotiating position; 11) For the purpose of divestiture, takeover, defense, diversification and expansion decisions; 12) To communicate measures to external stakeholders, and for external validation; 13) To achieve maximum commercial value extraction by: Maximizing operating performance to generate revenues at the lowest cost; maximizing the benefit from supplier and customer relations; minimizing the cost of the shareholders and lenders capital.

The sector of higher education in Jordan plays a key remarkable role in the process of comprehensive development at various levels and areas (Ministry of Higher Education and Scientific Research 2013). In Jordan, the higher education industry is an important and crucial sector for Jordanian economy. Economically speaking, this sector represents the most important sector in terms of gross national income (GNP) by attracting students from different surrounding countries, the number of foreign students study at the Jordanian universities which is close to 28.000 students from around the world (Ministry of Higher Education and Scientific Research 2013), and exporting highly educated individuals to surrounding countries, especially Gulf countries. It is worth mentioning that net workers' remittances during 2011 were JD 1,876.9 million (Central Bank of Jordan Annual Report 2011). This industry is IC intensive and depends mostly on people's

education, experience, and skills. Wachowiak (2010) stated: Higher education institutions can be considered to have a high level of IC. Moreover, Bratianu and Orzea (2012) said that the Gordian Knot of the IC of universities is the SC. Thus, the SC is the key component of the universities IC. Finally, Karami and Vafaei (2012) pronounced that IC development becomes a major driver for competitive advantage not only for business, but also for universities and other service industries. Therefore, the current study aims at measuring the effect of IC elements on the MEU's BP.

#### **Literature Review:**

In this section the authors will briefly discuss the most recent previous studies, and then they will take only a snapshot from each study due to limited space. The section will focus on interrelationships among IC components, as well as the impact of IC components on organizations' BP:

Astuti and Sabeni (2005) showed that HC positively and significantly linked to each others and positively and significantly linked to business performance. Maditinos *et. al.* (2009) found that HC is positively associated to RC, RC has an influence in SC, and SC has a positive relationship to BP. Sundac and Krmpotic (2009) revealed the only the synergy of HC, SC and RC can result in strong IC that becomes the source of the company's competitive advantage and value added. Kamukama *et. al.* (2010) concluded that the magnitude effect of HC on performance depends on SC or RC. Diez *et. al.* (2010) indicated that there is a positive relation between the use of HC and SC indicators, and value creation measured by sales growth. Ling (2011) stated that the value of IC components can mostly be actualized only in terms of their dynamic interrelationships and conjoint interaction. Taleghani *et. al.* (2011) showed that there are significant relationships between dimensions of the three ICs (HC, SC and RC) with productivity of Guilan Province. Ning *et. al.* (2011)

showed: There are positive relationships among IC components, and there is a positive relationship between HC and knowledge creation. Amiri *et. al.* (2011) indicated there are strong correlations between learning, or knowledge creation, and IC improvement. Yasir *et. al.* (2011) concluded that there is a strong association between IC components and the elements of virtual organization. Chang and Hsieh (2011) demonstrated that a moderating effect of HC on social capital and SC of organizations. Nazem (2011) revealed that the factor of integrity in organizational culture had the highest direct effect on the IC in Iranian universities.

Furthermore, Fan and Lee (2011) revealed that the R&D firms gained their innovation performance through HC not directly but via SC and more importantly RC. Harris *et. al.* (2011) stated that as a subset of an IC, IP is recognized to be the core element of an innovation. Elsetouhi and Elbeltagi (2011) concluded that there are significant positive relationships between IC, and process and product innovation. Rodrigues *et. al.* (2011) highlighted: The importance and influence of the IC on the innovativeness, and the value of IC as a competitive advantage in contemporary time. Kamukama *et. al.* (2011) stated: Competitive advantage is a significant mediator in the association between IC and financial performance in Ugandan microfinance institutions. Macerinskiene and Aleknaviciute (2011) found: IC and its components (HC, SC and RC) influence entrepreneurship formation. Maciocha (2011) proved that there is a clear and important role of IC in the corporate value creation. Rehman *et. al.* (2011) revealed that HC plays a significant role in IC performance of both life and non life insurance sector of Pakistan. Ahangar (2011) concluded that the performance of a company's IC can explain profitability, productivity and growth in sales. Lee *et. al.* (2011) proved that IC has a significantly positive impact upon the performance of an organization. Khalique *et. al.* (2011) showed: IC has

positive relationship with organizational performance. Uadiale and Uwugbe (2011) indicated that IC has a positive and significant relationship with the performance of business organizations in Nigeria. Matos *et. al.* (2011) deduced: There is a clear association between the IC management and organization's performance within Romanian and Portuguese Small and Medium-sized Enterprises (SMEs). Rafiei *et. al.* (2011) said that the relationship between IC components and BP were confirmed. Bannany (2011) stated that investment in information technology systems have significant impact on the IC performance, and then bank profitability. Carrington and Tayles (2011) indicated: IC measurement is associated with performance. Rahim *et. al.* (2011) indicated that IC has significant and positive relationship with firm's performance. Apriliani (2011) showed that is a significant influence between the IC with Financial Performance. Maditinos *et. al.* (2011) concluded that is a statistically significant relationship between HC and financial performance. Molodchik and Bykova (2011) showed that a company's IC influences favorably the organizational performance. Ahmadi *et. al.* (2011) confirmed: A positive relationship between IC and organization's performance. Santoso (2011) showed: A moderate positive relationship between IC and the performance of banks, and each component of IC also had moderate positive relationship with the banks' return on assets.

Moreover, Li *et. al.* (2012) presented that the positive effects and meaningful aspects of knowledge management and IC in gaining competitiveness. Zargar *et. al.* (2012) showed that HC influences knowledge creation, application and protection. SC influences knowledge acquisition, application, protection and conversion, and RC only has effect on knowledge acquisition. Hsiung and Wang (2012) said that IC components (SC, HC and RC) are not individually related to the company's value creation, and they have mutual contribution, advancement,

and growth. Sharafi *et. al.* (2012) showed: All dimensions of IC have a significant impact on dimensions of knowledge creation. Saadi and Pahlavani (2012) confirmed that all three IC items positively influence knowledge creation, significantly. Darvisha *et. al.* (2013) showed IC components influence positively organizations' learning capabilities. Ngugi *et. al.* (2012) found: There is an influence of IC on entrepreneurial skills and consequently on the growth of Small and Medium Enterprises in Kenya. Talebi and Bahamir (2012) indicated: IC effectively and positively influences organizational entrepreneurship. Javalgi *et. al.* (2012) found: An entrepreneurial orientation and RC are key contributors to India's professional service SMEs internationalization. Ghorbani *et. al.* (2012) showed: There is a relationship between IC management and organizational innovation. The results showed that RC was having higher effect, then HC, and finally OC. Oprescu (2012) revealed that countries in the highest stage of development also rank high at innovation and competitiveness as a part of IC. Stoeckicht (2012) concluded: A significant correlation between the companies' capability to innovate and the IC management. Al-Dujaili (2012) indicated: Only SC and HC have influence upon organizational innovation. Ahmadi *et. al.* (2012a) proved that there was a positive significance relationship between IC and new product development performance.

In addition, Nazem and Sadeghi (2012) indicated: IC dimensions have a direct effect on productivity, and HC had the highest direct effect on productivity. Chegini and Ramzanpour (2012) showed that there is a positive and significant correlation between the IC dimensions and productivity of the organizations. Basuki and Kusumawardhani (2012) proved: IC components impact profitability of the pharmaceutical industry in a significant and positive manner. Bhasin (2012) concluded: The

selected pharmaceutical companies reported a positive value of IC; significant correlation between IC and net operating profits. Henningsson *et. al.* (2012) said company's IC contributes to earnings' estimates and company's valuation. Aminian *et. al.* (2012) showed IC can create valid data in relation to the gap between companies' market value and book value. Lalbar *et. al.* (2012) showed there is a positive and meaningful relationship between the IC efficiency coefficient and the ratio of market to book value. Shiri *et. al.* (2012) indicated IC and its components have a significant and positive relationship with market value added. Talebnia *et. al.* (2012) showed the positive effect of IC on created value for shareholders. Mehdi and Reza (2012) indicated there is a significant relationship between IC and economic growth and there is a non-significant relationship between IC and market value. Jafari (2012) showed: There is a significant relationship between IC and financial performance and there is a non-significant relationship between IC and market value.

Over and above, Chalotra and Sharma (2012) suggested: The level of investment in IC is associated with management accounting practices, business performance, and the ability to respond to future events. Tayari and Ghermezi (2012) showed IC has an influence on management accounting practices and on organizational performance. Novas *et. al.* (2012) confirmed: There is an interaction among the three IC dimensions, and showed a positive and significant direct effect of SC on performance. Zulmiati (2012) proved: Not all of IC components have significant effect on performance. Shakina and Bykova (2012) stated: There is a complementarity between IC components that impacts company's performance. Chen (2012) found a bank's SC positively and directly affects performance, while a bank's HC and RC jointly positively affect performance. Saeedi *et. al.* (2012a) concluded IC

components, RC and HC were having more powerful effect on performance than other variables. Naveed and Malik (2012) deduced IC has unique and competitive characteristics which considerably affect firm's performance. Talman *et. al.* (2012) showed there is a strong relationship between IC components and companies' performance. Gilaninia and Matak (2012) indicated: There is relationship between the dimensions of IC (HC, RC, and SC) and enterprises' performance. Mohsen *et. al.* (2012) showed IC has significant and positive effect on organizational performance. Molodchik *et. al.* (2012) found: A positive effect of IC on company performance. Gorji *et. al.* (2012) indicated: The IC components affect organizations' performance. Mehdivand *et. al.* (2012) showed: HC and RC have direct and indirect effect on Nano-Businesses performance, while SC has only indirect effect on it, through entrepreneurial orientation. Remus (2012) highlighted: The IC and its effects on the organizational performance of an educational institution. Djilali *et. al.* (2012) found: The three types of IC together are associated with increase business performance of Algerian firms. Kamaluddin *et. al.* (2012) showed: SC mediates the relationship between HC and RC with organization effectiveness, which affects performance. Dmitrovic *et. al.* (2012) concluded the use of adequate knowledge creates IC that provides an important factor for business performance. Agoston and Dima (2012) concluded: Organizational IC directly and positive related to the competitiveness level and the overall performance. Rafiei *et. al.* (2012) showed there are some correlations between IC components and performance. Wu *et. al.* (2012) showed IC and corporate governance have a positive and significant interaction effect on the organizational performance in listed Taiwan IC design companies. Chang and Lee (2012) indicated: A significantly interactive influence of IC upon the

organizational performance of Taiwan-listed info-electronics companies. Wang (2012) concluded: Organizational culture has a significantly positive influence on IC, which in turn affects the organizational performance in a significant and positive manner. Puntillo (2012) found: The HC determinants affect corporate performance. Sharabati (2013) indicated: A positive significant relationship between HC and organizations' BP, HC can clearly explain productivity and profitability more than market valuation. Saeedi *et al.* (2012b) concluded: RC has the highest effect among IC components on organizations' performance. Ikonen (2012) revealed: The process of trust development as a part of IC in universities is very important. Modaresi *et al.* (2012) indicated: The IC development affects the university efficiency significantly.

Finally, Wibowo (2012) concluded: There is a positive association between the value added of IC and financial performance in Indonesia banking companies. Rehman *et al.* (2012) revealed: HC and SC have substantive positive relationship with financial performance. Dadashinasab *et al.* (2012) proved: Firms' IC had a positive impact on financial performance. Rahman (2012) confirmed: Greater IC efficiency leads to better financial performance. Ahmadi *et al.* (2012b) showed: There is a positive relationship between IC management and financial turnover of the organizations. Zehri *et al.* (2012) revealed: A positive and significant association between the components of IC and economic factors and financial performance. Mosavi *et al.* (2012) concluded: Companies with greater HC efficiency have higher ratios of market-to-book value and have better financial performance. Darabi *et al.* (2012) showed: IC and its HC component have a significant positive impact on earnings quality and lead to conclude that IC has a positive role in financial practices and reporting. Besharati *et al.* (2012) indicated: There is a significant

relationship between IC and financial performance of corporations. Fathi *et al.* (2013) showed there is significant positive relationship between IC and financial performance. Mobaraki *et al.* (2013) concluded the success of companies depends upon relational capital and entrepreneurial team.

On the contrary, Roodposhti and Rajaei (2012) revealed that there is no meaningful relation between IC and economic value added. Kangarlouei *et al.* (2012) showed: There is no significant relationship between IC and competitive advantage in Tehran Stock Exchange. Mehralian *et al.* (2012) failed to support the impact of IC on market value. Aminbeidokhti and Darvishkhadem (2012) showed that a meaningful relationship among components of IC, but this unity and relationship was not confirmed between these IC components and organization's performance. Hadjali *et al.* (2013) found: In branches of EN Bank in Tehran province, there are strong mutual relationships between the components of IC (HC, SC and CC) but these capitals and the relationships between them are not related to organizational performance.

From the literature reviews above, it seems that almost all organizations and institutions, whether private or public, profitable or non-profitable organizations should measure, evaluate, manage and develop their IC to be able to sustain long term survival. Therefore, the current study will explore the impact of IC on MEU's BP to provide university decision makers with comments related for IC management for further BP development.

#### **Study Purpose and Objectives:**

This study investigates the effect of IC management on the MEU's performance i.e. cause-affect perspective research. For this purpose, the current study attempts to find the impact of intellectual capital elements (human capital, structural capital and relational capital) on MEU's performance. In relation to this purpose, the previous empirical researches showed that there are

three research challenges: The first challenge is how to separate the intellectual capital elements indicators, because they are strongly inter-related with each other. The second challenge is to explore the relationship between each intellectual capital element and the organizations' business performance. Consequently, the third challenge is analyzing intellectual capital from an organizational point of view. More specifically, this study intends to answer the following question: Is there a direct impact of IC elements on MEU's BP?

The main objective of this research was to provide sound recommendations about performance measurement within IC context by identifying and defining the main attributes of quality and productivity of IC, i.e. to point out critical factors of IC and find suitable ways for measurement and management in that context.

#### **Study Importance and Scope:**

The current study partially focuses on managerial norms, and partially on social norms. A better understanding of the effect of IC elements on the MEU's BP draws conclusions that can be beneficial not only for MEU but also to other universities, organizations, institutions and policy makers. The content also may be of an interest to academic studies related to the reporting and decision making concerning IC. This study takes into consideration the manageability of the so-called IC elements, i.e. how they can be managed by employing the framework of performance measurement. This study presents the problem at an organizational level, as it is the level of implementing strategies and management. The current study might be considered as initiative that presents the effect of IC on MEU's BP. If this study is put to use in the near future, it could present an important cornerstone that facilitates cross-disciplinary dialogue and hopefully establishes a bases for IC measurement and development in Jordanian universities. This research is also an important one, in terms of the

analysis of the situation of IC in Jordanian universities and organizations, as well as in determining some of the relevant IC indicators used by those universities.

#### **Problem Statement:**

The problem of defining, measuring and managing IC is not limited to one organization, industry, or country, but it is a worldwide problem (Tayles *et. al.* 2005). Furthermore, Sharabati *et. al.* (2010) stated: The concept of IC is not well known to most managers in Jordan. Moreover, Vashishtha *et. al.* (2012) said: Management of IC cannot be possible without measuring it. Finally Manzari *et. al.* (2012) specified: Every organization should select its appropriate IC definition and its indicators to measure it. Therefore, the purpose of this research is to investigate the effect of IC elements on MEU's BP.

#### **Problem Elements:**

The study problem can be perceived by having detailed and scientific answers to the following questions:

#### **First Question:**

1. Are there differences among respondents' demographic characters regarding their perception about the implementation of IC elements within MEU?

#### **Second question:**

2. Is there a direct impact of IC on MEU's BP?

This second question can be divided into three questions according to IC elements as follows:

2.1. Is there a direct impact of the HC element (variable) on MEU's BP?

2.2. Is there a direct impact of the SC (OC) element (variable) on MEU's BP?

2.3. Is there a direct impact of the RC (CC) element (variable) on MEU's BP?

#### **Study Hypotheses:**

Based on the above-mentioned problem statement



and its elements, and according to the study model, the following hypotheses can be developed:

**First hypothesis:**

H0.1: No differences among respondents' demographic characters regarding their perception about the implementation of IC elements within MEU, at  $\alpha=0.05$ .

**Second Hypothesis:**

H0.2: IC variables do not have a direct impact on MEU's BP, at  $\alpha=0.05$ .

This Second hypothesis can be divided into three hypotheses according to the IC elements (variables) as follows:

H0.2.1: HC variable does not have a direct impact on

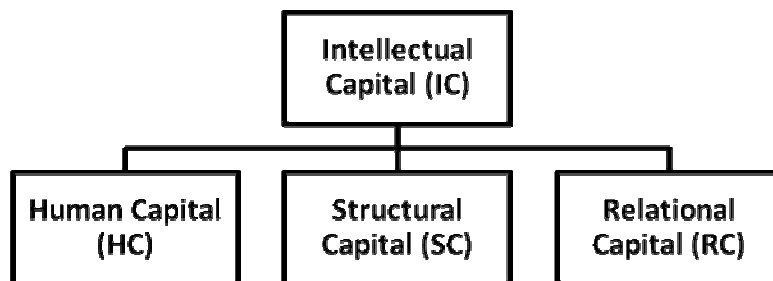
MEU's BP, at  $\alpha=0.05$ .

H0.2.2: SC Variable does not have a direct impact on MEU's BP, at  $\alpha=0.05$ .

H0.2.3: RC variable does not have a direct impact on MEU's BP, at  $\alpha=0.05$ .

**Study Model**

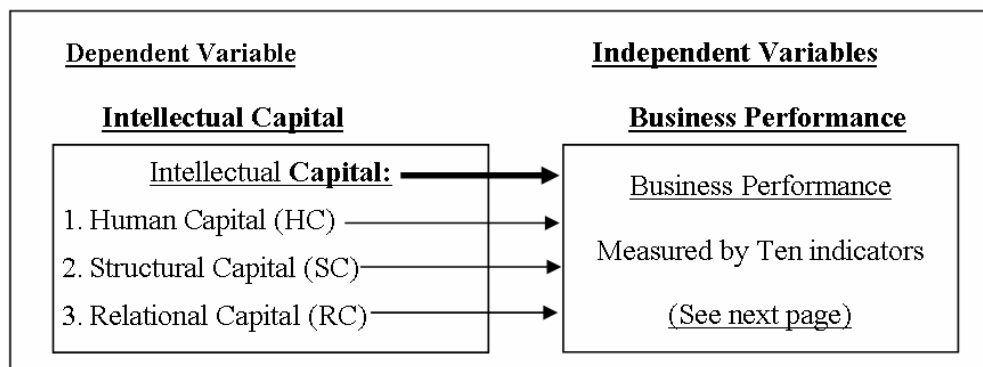
Whatever the classification used in any research or literature, the aim was to understand, measure and manage the IC. This study uses the most widely used classification model that is fundamentally based on both Stewart's and Bontis's classification as shown in figure (1): HC, SC and RC.



**Figure (1): Study Basic Model**

The current research studies the effect of IC variables

on MEU's BP as shown in the study model figure (2).



**Figure (2): Study Mode**

**Study Design and Nature:**

One of the ways to validate the theme of the current research is to investigate how organizations use their IC to improve performance. In order to empirically validate the study's model, a survey method was conducted in line with earlier studies. The data were collected from workers and students at MEU. The collected data verified through the SPSS 20 focusing on the correlation among IC elements and their relationships with MEU's performance. It was also the intention of the researchers to identify the present level of IC and investigate which component of IC elements has a more critical influence on the MEU's BP. The current study is considered as a casual study, because it aimed at investigating the cause/effect relationship between IC elements and MEU's BP. It started with literature review and experts' interviews to develop the currently used measurement model and explore the IC profile of MEU. Then, a panel of judges was conducted to finalize the items to be included in the questionnaire. Finally, the survey was conducted, and the results were compared with previous researches.

**Population, Sample and Unit of Analysis:** The Middle East University (MEU) is a Jordanian private university inaugurated its first phase on June 30, 2005. At the time of the study, the total number of its staffs were about 200 (Academics and Administrative Staffs) and students were about 3017 (Master and Bachelor), the entire population was targeted to explore the topic of IC, thus negating any need for sampling. The survey unit of analysis was composed of all Academics, Administrative staffs, and Master & Bachelor students at MEU. Actual data were collected from the staffs and students who were available at the time of the surveying without using any method for selecting the sample.

**The Questionnaire:** One of the main tools in actualizing a research project is the development of a tested

instrument. Initial items to measure various constructs were developed depending on prior researches. With the help of experts the questionnaire was designed and developed in contrast with hypotheses and research model. Then the questionnaire was validated through expert interviews and a panel of judges.

**Questionnaire Variables:** Independent variables (IC): Through literature review, the researcher has identified three important independent variables of IC that contribute to MEU's BP: HC, SC and RC. Each was tested by 21 questions. Dependent variable of the study is related to MEU's BP. BP was measured through the following 10 indicators: industry leadership, future outlook, overall response to competition, success rate in new programs launches, overall BP and success, employee productivity, process (transaction) productivity, sales growth (no. of students), profit growth, university's market valuation (stock value). All variables were measured by five-point Likert-type scale to tap into the individual's perceptions, ranging from value 1 (strongly disagree) to value 5 (strongly agree) used throughout the questionnaire.

**Data Collection and Analysis:**

Questionnaires were delivered to 220 out of 3217 staffs and students (those who were available in the MEU at the time of surveying). This resulted in sample rate of about 7% of the total population. The researchers gathered only 180 questionnaires only 167 (31 Academics, 30 administrative staffs, 62 Master and 44 Bachelor students) questionnaires were suitable for further analysis, representing 5% of the total unit of analysis.

**Kolmogorov-Smirnov Z Test for Normal Distribution:** In order to verify the normal distribution of variables, the researchers carried out Kolmogorov-Smirnov (K-S) Z test. All dependent and independent variables were tested for normality. If the significance level was more than 5 percent, normality was assumed

(Bollen *et. al.* 2005, Sharabati *et. al.* 2010). Table (1) are normally distributed. shows that all the independent and dependent variables

**Table (1): Normality Test: One-Sample Kolmogorov-Smirnov (Z) Test**

Variables	(K-S)Z	Sig.
Human Capital	0532	0940
Structural Capital	1.019	0.25
Relational Capital	0.528	0.943
Intellectual Capital	0.853	0.912
Business Performance	0794	0.554

**Reliability Test (Cronbach’s Alpha):**

Reliability test was used to test the consistency and suitability of the measuring tools. The reliability was evident by strong Cronbach’s alpha coefficients of internal consistency. If Alpha Coefficients were above 0.80, they were considered high, and if they were above 0.75, they were accepted, while if they were below 0.60, then results

indicated weak internal inconsistency (Bollen *et. al.* 2005), while Sharabati *et. al.* (2010) stated that Alpha coefficients above 0.7 are accepted. As shown in table (2), the results of Cronbach’s alpha were registered acceptable; however, Cronbach’s Alpha results were between 0.855 and 0.95. The above result also matches with Bin Ismail (2005) and Moslehi *et. al.* (2006)

**Table (2): Cronbach’s Alpha**

Variables	Alpha
Human Capital	0.855
Structural Capital	0.915
Relational Capital	0.912
Intellectual Capital	0.950
Business Performance	0.847

**Validity:**

Two methods were used to confirm content validity: First, multiple sources of data (literatures, expert interviews and panel of judges) were used to develop and refine the model and measures. Then, factor analysis was carried out for all items included in the questionnaire.

**Factor Analysis (Principal Component Analysis):**

Factor analysis was used to measure the validity of each

item (loading) within its variable and how each variable is loaded within IC. Pearson’s Principal Component Factor Analysis was conducted. According to Bin Ismail (2005), Bollen *et. al.* (2005) and Sharabati *et. al.* (2010) factor loading value below 0.4 should be removed. Table (3) shows that all variables and variable items were valid, since their factor loading values were more than 0.4.

**Table (3): Factors Loading for Dependent and Independent Variables**

Variables	Extraction	Factor 1
Human Capital	0.650	0.806
Structural Capital	0.752	0.867
Relational Capital	0.771	0.878
Intellectual Capital	0.975	0.988
Business Performance	0.603	0.776

#### **Respondents Demographic Description and Analysis:**

H0.1: No differences among respondents' demographic characters regarding their perception about the implementation of IC elements within MEU, at  $\alpha=0.05$ .

Tables (4, 5 & 6) show that there was no significant difference between the means of students and employees, bachelor and master students, as well as, between both genders regarding their perception about implementing independent and dependent variables,

where ( $P > 0.05$ ). While tables (7, 8, 9 & 10) also show that there were no significant differences in the means among student age groups, employee age groups, employee experience and employee education regarding implementation of dependent and independent variables, where ( $P > 0.05$ ). Therefore, the null hypothesis is accepted, which indicates that: No differences among respondents' demographic characters regarding their perception about the implementation of IC elements within MEU, at  $\alpha=0.05$ .

**Table (4): T-Test Results for Independent and Dependent Variables against Jobs**

	Job	No.	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
Human Capital	Employee	61	36.53	2.9633	.54533	.06982	1.280	.259
	Students	106	63.47	3.0045	.50752	.04929		
Structural Capital	Employee	61	36.53	2.7393	.64650	.08278	.033	.856
	Students	106	63.47	2.9200	.61860	.06008		
Relational Capital	Employee	61	36.53	3.0055	.62228	.07967	.002	.961
	Students	106	63.47	2.9753	.62376	.06059		
Intellectual Capital	Employee	61	36.53	2.9027	.52324	.06699	.183	.669
	Students	106	63.47	2.9666	.50509	.04906		
Business Performance	Employee	61	36.53	3.2607	.60890	.07796	.063	.802
	Students	106	63.47	3.2472	.60051	.05833		

**Table (5): T-Test Results for Independent and Dependent Variables against Genders**

	Gender	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
Human Capital	Male	125	74.85	3.0076	.53991	.04829	2.647	.106
	Female	42	25.15	2.9354	.45914	.07085		
Structural Capital	Male	125	74.85	2.8343	.64683	.05785	.264	.608
	Female	42	25.15	2.9127	.59364	.09160		
Relational Capital	Male	125	74.85	3.0057	.59290	.05303	1.569	.212
	Female	42	25.15	2.9286	.70444	.10870		
Intellectual Capital	Male	125	74.85	2.9492	.51311	.04589	.111	.739
	Female	42	25.15	2.9255	.51105	.07886		
Business Performance	Male	125	74.85	3.2616	.58320	.05216	.593	.442
	Female	42	25.15	3.2238	.66068	.10194		

**Table (6): T-Test Results for Independent and Dependent Variables against Student Course**

	Course	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
Human Capital	Bachelor	44	41.51	3.0649	.53265	.08030	.887	.349
	Master	62	58.49	2.9616	.48874	.06207		
Structural Capital	Bachelor	44	41.51	3.0119	.67898	.10236	1.836	.178
	Master	62	58.49	2.8548	.56859	.07221		
Relational Capital	Bachelor	44	41.51	3.0844	.60136	.09066	.394	.531
	Master	62	58.49	2.8978	.63255	.08033		
Intellectual Capital	Bachelor	44	41.51	3.0538	.51007	.07690	.109	.742
	Master	62	58.49	2.9048	.49636	.06304		
Business Performance	Bachelor	44	41.51	3.3705	.55093	.08306	.724	.397
	Master	62	58.49	3.1597	.62291	.07911		

**Table (7): One-Way ANOVA Test Results for Independent and Dependent Variables against Student Age**

	Age	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
Human Capital	<24	44	41.51	3.0011	.55575	.08378	.186	.906
	25-29	40	37.74	3.0429	.48524	.07672		
	30-35	9	8.49	2.9365	.47559	.15853		
	35<	13	12.26	2.9451	.46772	.12972		
	Total	106	100	3.0045	.50752	.04929		
Structural Capital	<24	44	41.51	2.9957	.67553	.10184	1.104	.351
	25-29	40	37.74	2.7810	.55131	.08717		
	30-35	9	8.49	2.9947	.67236	.22412		
	35<	13	12.26	3.0403	.56439	.15653		
	Total	106	100	2.9200	.61860	.06008		
Relational Capital	<24	44	41.51	3.0574	.59905	.09031	1.059	.370
	25-29	40	37.74	2.8429	.66046	.10443		
	30-35	9	8.49	2.9683	.50283	.16761		
	35<	13	12.26	3.1099	.65534	.18176		
	Total	106	100	2.9753	.62376	.06059		
Intellectual Capital	<24	44	41.51	3.0180	.51824	.07813	.533	.661
	25-29	40	37.74	2.8889	.48882	.07729		
	30-35	9	8.49	2.9665	.51087	.17029		
	35<	13	12.26	3.0317	.53374	.14803		
	Total	106	100	2.9666	.50509	.04906		
Business Performance	<24	44	41.51	3.2477	.57607	.08685	.169	.917
	25-29	40	37.74	3.2875	.60561	.09576		
	30-35	9	8.49	3.1667	.45826	.15275		

	Age	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
	35<	13	12.26	3.1769	.78650	.21814		
	Total	106	100	3.2472	.60051	.05833		

**Table (8): One-Way ANOVA Test Results for Independent and Dependent Variables against Employee Age**

	Age	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
Human Capital	20-29	14	22.95	2.9694	.60655	.16211	.614	.608
	30-39	12	19.67	2.9722	.51626	.14903		
	40-49	21	34.43	2.8549	.49429	.10786		
	50<	14	22.95	3.1122	.60019	.16041		
	Total	61	100	2.9633	.54533	.06982		
Structural Capital	20-29	14	22.95	2.6122	.71217	.19034	.837	.479
	30-39	12	19.67	2.7341	.71370	.20603		
	40-49	21	34.43	2.6735	.57267	.12497		
	50<	14	22.95	2.9694	.63631	.17006		
	Total	61	100	2.7393	.64650	.08278		
Relational Capital	20-29	14	22.95	2.8027	.70849	.18935	1.477	.230
	30-39	12	19.67	3.1071	.55944	.16150		
	40-49	21	34.43	2.9206	.56751	.12384		
	50<	14	22.95	3.2483	.62930	.16819		
	Total	61	100	3.0055	.62228	.07967		
Intellectual Capital	20-29	14	22.95	2.7948	.59171	.15814	1.148	.338
	30-39	12	19.67	2.9378	.50556	.14594		
	40-49	21	34.43	2.8163	.45422	.09912		
	50<	14	22.95	3.1100	.55482	.14828		

	Age	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
	Total	61	100	2.9027	.52324	.06699		
Business Performance	20-29	14	22.95	3.2000	.64926	.17352	1.160	.333
	30-39	12	19.67	3.4250	.59867	.17282		
	40-49	21	34.43	3.1000	.58652	.12799		
	50<	14	22.95	3.4214	.59895	.16008		
	Total	61	100	3.2607	.60890	.07796		

**Table (9): One-Way ANOVA Test Results for Independent and Dependent Variables against Employee Experience**

	Experience	N		Mean	Std. Deviation	Std. Error	F	Sig.
Human Capital	<5	16	26.23	3.0387	.55919	.13980	.699	.556
	6-10	19	31.15	2.8296	.60240	.13820		
	11-15	10	16.39	2.9238	.45354	.14342		
	16<	16	26.23	3.0714	.52511	.13128		
	Total	61	100	2.9633	.54533	.06982		
Structural Capital	<5	16	26.23	2.5446	.71311	.17828	.746	.529
	6-10	19	31.15	2.7519	.70890	.16263		
	11-15	10	16.39	2.8857	.49344	.15604		
	16<	16	26.23	2.8274	.59244	.14811		
	Total	61	100	2.7393	.64650	.08278		
Relational Capital	<5	16	26.23	2.9762	.64029	.16007	.389	.762
	6-10	19	31.15	2.9749	.64445	.14785		
	11-15	10	16.39	2.8905	.69300	.21915		
	16<	16	26.23	3.1429	.56691	.14173		
	Total	61	100	3.0055	.62228	.07967		



	Experience	N		Mean	Std. Deviation	Std. Error	F	Sig.
Intellectual Capital	<5	16	26.23	2.8532	.56935	.14234	.336	.799
	6-10	19	31.15	2.8521	.56050	.12859		
	11-15	10	16.39	2.9000	.49927	.15788		
	16<	16	26.23	3.0139	.47474	.11868		
	Total	61	100	2.9027	.52324	.06699		
Business Performance	<5	16	26.23	3.3875	.62490	.15622	.525	.667
	6-10	19	31.15	3.2368	.68411	.15695		
	11-15	10	16.39	3.0800	.61246	.19368		
	16<	16	26.23	3.2750	.51575	.12894		
	Total	61	100	3.2607	.60890	.07796		

**Table (10): One-Way ANOVA Test Results for Independent and Dependent Variables against Employee Education**

	Education	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
Human Capital	Diploma	5	8.20	3.1810	.41704	.18651	0.673	.572
	Bachelor	17	27.87	2.9244	.54582	.13238		
	Master	8	13.11	3.1369	.73438	.25964		
	Ph.D.	31	50.82	2.9048	.51625	.09272		
	Total	61	100	2.9633	.54533	.06982		
Structural Capital	Diploma	5	8.20	3.0381	.23425	.10476	0.862	.466
	Bachelor	17	27.87	2.8431	.63949	.15510		
	Master	8	13.11	2.7917	.91241	.32258		
	Ph.D.	31	50.82	2.6206	.61641	.11071		
	Total	61	100	2.7393	.64650	.08278		
Relational Capital	Diploma	5	8.20	3.2286	.38155	.17063	1.659	.186
	Bachelor	17	27.87	2.9132	.70474	.17093		

	Education	N	Percentage	Mean	Std. Deviation	Std. Error	F	Sig.
	Master	8	13.11	3.3988	.65388	.23118		
	Ph.D.	31	50.82	2.9186	.57291	.10290		
	Total	61	100	3.0055	.62228	.07967		
Intellectual Capital	Diploma	5	8.20	3.1492	.14617	.06537	1.084	.363
	Bachelor	17	27.87	2.8936	.54290	.13167		
	Master	8	13.11	3.1091	.71710	.25353		
	Ph.D.	31	50.82	2.8146	.48784	.08762		
	Total	61	100	2.9027	.52324	.06699		
Business Performance	Diploma	5	8.20	3.5800	.49193	.22000	1.880	.143
	Bachelor	17	27.87	3.3176	.62673	.15201		
	Master	8	13.11	3.5500	.82289	.29093		
	Ph.D.	31	50.82	3.1032	.52439	.09418		
	Total	61	100	3.2607	.60890	.07796		

### Study Variables Analysis

#### Dependent and Independent Variables:

Table (11) shows that the average means of the respondents' perception about the implementation of IC variables were ranging from 2.85 to 2.99, with standard deviation that ranges from (0.511 to 0.633). Such results indicate that there is an agreement on that MEU has low implementation of IC variables. The overall result indicates that there is no significant implementation of

the IC variables in MEU, where the total average mean was 2.94 and ( $t=-1.435 < 1.645$ ). The table also shows that the average means of the respondents' perception about the role of BP indicators was 3.25, with standard deviation (0.602). Such results indicate that there is an agreement on the role of BP indicators. The result indicates that there is a significant role of performance indicators, where ( $t=5.414 > 1.645$ ).

**Table (11): Mean, Standard Deviation and One-Sample T-Test Results for All Variables.**

Variables	Mean	Std. deviation	T value	T tabulated
HC	2.99	0.520	-0.262	1.645
SC	2.85	0.633	-2.980	1.645
RC	2.99	0.622	-0.285	1.645
IC	2.94	0.511	-1.435	1.645
BP	3.25	0.602	5.414	1.645

**Relationships between the Study Variables:**

Before testing the hypotheses, Pearson correlation (r) was carried out to test the correlation among the

responses of IC variables, then between them and performance indicators.

**Table (12): Pearson’s Correlation (r) Among Independent Variables, and with Dependent Variable**

Variable	HC	SC	RC	IC	BP
<b>HC</b>					
<b>SC</b>	0.596**				
<b>RC</b>	0.526**	0.713**			
<b>IC</b>	0.798**	0.904**	0.878**		
<b>BP</b>	0.582**	0.499**	0.654**	0.668**	

**\*Correlation is significant at 0.01 levels (2-tailed)**

Pearson correlation matrix table (12) shows that the relationships among the IC variables are strong, where r ranges from 0.526 to 0.713. The correlation between HC and SC is strong, where r equals 0.596; and the correlation between HC and RC is strong, where r equals 0.526. Finally, the correlation between SC and RC is also strong, where r equals 0.713. The matrix also indicates that the relationship between the total IC and each IC variable is very strong, where r ranges from 0.798 to 0.904. The matrix also showed that the relationship between IC variables and MEU's BP is strong, where r ranges from 0.499 to 0.654. For total IC r reaches 0.668, which indicates a very strong relationship between IC and MEU's BP.

**Hypotheses Testing**

To test hypotheses, a multiple regression analysis was used to analyze the relationship between the IC variables and MEU's BP. Regression analysis is robust against non-normality, therefore, applicable in the case at hand. The coefficient of determination ( $R^2$ ) indicates the goodness and fitness of the model.

**The Main Hypothesis:**

H0.2: IC variables do not affect the MEU's BP, at  $\alpha=0.05$ .

Before conducting the multiple regression models, the researchers tested the underlying assumption of the test:

**Multi-Collinearity:** From table (13), the VIF value is less than 10 and the Tolerance value is more than 0.2. This indicates that there is no multi-collinearity within the independent variables of the study.

**Table (13): Multi-Collinearity Test for the Main Hypothesis:**

Intellectual capital Sub-variables	Multi-Collinearity Statistics	
	Tolerance	VIF
HC	0.624	1.602
SC	0.424	2.358
RC	0.476	2.102

**Independence of errors:** To test this assumption, Durbin Watson test is conducted where ( $d=1.981$ ), which approximately equals two. This indicates that the residuals are not correlated with each other; therefore,

the independence of errors is not violated.

After achieving the underlying assumption of the regression model, the researchers conducted the following analysis:

**Table (14): Results of Multiple Regressions Analysis: Regressing IC Variables against Performance**

Variable	r	R <sup>2</sup>	F- Value	Sig.
IC Variables	0.714	0.509	56.423	0.000

The results of the multiple regression analysis that regress the three variables of the IC are shown on table (14) above. The three variables together explained 50.9 percent of the variance, where ( $R^2 = 0.509$ ,  $F=56.423$ ,  $Sig.=0.000$ ), therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the IC variables affect the MEU's BP, at  $\alpha = 0.05$ . The following table shows the significant effect of each variable within the IC.

The conclusion of table (45) shows that the RC variable has the highest effect on MEU's BP, where

( $Beta=0.533$ ,  $sig.=0.000$ ). Thus, it indicates that the RC variable is the most significant and positively and directly regresses to the MEU's BP, followed by HC variable, where ( $Beta=0.358$   $sig.=0.000$ ), while SC variable has the lowest (negative) effect on MEU's BP, where ( $Beta=-0.094$   $sig.=0.265$ ). The relationship between the dependent and independent variables derived by this model can thus be expressed as:

$$IC = 0.730 + 0.358 (HC) - 0.094 (SC) + 0.533 (RC).$$

**Table (15): Un-standardized and Standardized Coefficients of Multiple Regression Model for IC Variables**

IC Variables	Un-standardized Coefficients		Standardized Coefficients	t-value	p
	B	Std. Error	Beta		
(Constant)	0.730	0.205		3.568	0.000*
HC	0.414	0.080	0.358	5.154	0.000*
SC	0.054	0.080	-0.094	-1.119	0.265
RC	0.469	0.110	0.533	6.698	0.000*

\*Calculate is less than 0.05

H0.2.1: HC variable does not have a direct impact on MEU's BP, at  $\alpha=0.05$ .

From table (15), it is concluded that there is a positive direct effect of the HC variable on the MEU's BP, where (Beta=0.358, sig.=0.000). Since ( $t=5.154, p < 0.05$ ), the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the HC variable affects the MEU's BP, at  $\alpha=0.05$ .

H0.2.2: SC variable does not have a direct impact on MEU's BP, at  $\alpha=0.05$ .

From table (15), it is concluded that there is no significant positive direct effect of the SC variable on the MEU's BP, where (Beta=-0.094, sig.=0.265). Since ( $t=-1.119, p > 0.05$ ), the null hypothesis is accepted,

which indicates that the SC variable does not affect the MEU's BP, at  $\alpha=0.05$ .

H0.2.3: RC variable does not have a direct impact on MEU's BP, at  $\alpha=0.05$ .

From table (15), it is concluded that there is a positive direct effect of the RC variable on the MEU's BP, where (Beta=0.533, sig.=0.000). Since ( $t=6.698, p < 0.05$ ), the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the RC variable affects the MEU's BP, at  $\alpha=0.05$ .

**Stepwise regression:**

To determine which variables are important in this model, the researchers used stepwise regression model shown in following table:

**Table (16): Stepwise Regressions (ANOVA) for IC Variables**

Model	r	R <sup>2</sup>	F	Sig.	IC Variables
1	0.654(a)	0.427	123.112	0.000	RC
2	0.711(b)	0.506	83.881	0.000	RC and HC

From table (16), the first model of stepwise regression shows the importance of the RC variable, where ( $R^2=0.427, F=123.112, Sig.=0.000$ ). The second model of stepwise regression shows the importance of the RC and HC, where ( $R^2 =0.506, F=83.881, Sig. =0.000$ ). Therefore, it is concluded that the second model increases  $R^2$  with 0.079.

This means that the RC variable alone explain 42.7% of the variance, while the second model explains 50.6% of the variance. This means that HC adds 7.9% to the first model. The following table shows the relation between the IC variables and MEU's BP:

**Table (17): Stepwise Regressions Model for Relational Capital variables**

IC Variables	Model 1		Model 2	
	Un-standardized Coefficients B	Standardized Coefficient Beta	Un-standardized Coefficients B	Standardized Coefficient Beta
Constant	1.362		0.725	
RC	0.633	0.654	0.465	0.481
HC			0.381	0.329
SC				

\*sig. <0.05

From table (17) above, the first model of stepwise regression shows that there is a positive direct relation between RC variable and MEU's BP, where beta equals 0.654. The second model of stepwise regression shows that there is a positive direct relation between the RC variable and HC variable with MEU's BP, where beta equals 0.481 and 0.329, respectively. Such results indicate that the relation with RC variable is the most important variable, followed by HC variable, while the SC variable does not significantly impact the MEU's BP.

### Data Results Discussion

#### Dependent and Independent Variables Results

##### Discussion:

The overall result indicated that there is no significant implementation of the IC variables in MEU. Results also indicated that the MEU does not implement any IC

element, or there is low implementation of IC components. It is clear that the respondents are either unaware of the role of IC components in MEU's BP, or they do not believe that IC components affect MEU's BP. The reason for this may be related to the low management board support. As shown in table (18), the current study results are contradicting with many previous studies and results are matching with only few previous studies. The result showed that there is a significant role of BP indicators. It seems that respondents are in agreement on the role of BP indicators. Evidence appears to suggest an improvement in MEU's BP. Therefore, the MEU is directed and strongly leaning toward performance improvement, and the respondents are aware of the role of business performance indicators. As shown in table (18), the current study results are matching with almost all previous studies regarding the BP indicators.

**Table (18): Comparison between the Variables Means of Different Studies**

Study	Year	Country	HC	SC	RC	IC	Performance
Current Study	2013	Jordan	2.99	2.85	2.99	2.94	3.25
Miller <i>et. al.</i>	1999	Canada	3.63	2.80	3.47	3.30	3.02
Berglund <i>et. al.</i>	2002	Sweden	3.15	1.85			
Sofian <i>et.al.</i>	2004	Malaysia	3.94	3.58	3.89	3.80	3.20
Bin Ismail	2005	Malaysia	3.36	3.39	3.36	3.37	3.01
Moslehi <i>et. al.</i>	2006	Iran	3.15	2.23	3.85	3.08	2.4
Salleh & Salamat	2007	Malaysia	3.71	3.62	3.83	3.72	
Sharabati <i>et. al.</i>	2010	Jordan	3.43	3.06	3.45	3.32	3.46
Santoso	2011	Indonesia	3.67	3.77	3.69	3.54	2.49
Sharafi <i>et. al.</i>	2012	Iran	3.36	3.38	3.48		3.38
Gorji <i>et. al.</i>	2012	Iran	3.58	3.55	3.51	3.55	
Djilali <i>et. al.</i>	2012	Algeria	3.80	3.52	3.86	3.53	4.14

#### Hypothesis Analysis Results Discussion:

The results indicated that the IC variables affect the

MEU's BP, at  $\alpha = 0.05$ . Moreover, results concluded that the HC and RC variables affect the MEU's BP, at  $\alpha$

=0.05. However, the results also showed that the SC variable does not affect the MEU's BP, at  $\alpha = 0.05$ . Meanwhile, the results proved that the RC variable was having the highest effect among IC components on

MEU's BP, followed by HC variable; while SC variable has the lowest (negative) effect on MEU's BP. Table (19) showed that the current study results are matching with almost all previous studies.

**Table (19): Correlation ( $R^2$ ) Between IC Variables and Business Performance for Different Studies**

Variable	Current Study	Bontis 1999	Bollen <i>et. al.</i> 2005	Bin Ismail 2005	Wang & Chang 2005	Sharabati <i>et. al.</i> 2010	Djilali <i>et. al.</i> 2012	Nazem & Sadeghi 2012	Zehri <i>et. al.</i> (2012)
HC	0.338		0.522	0.344		0.437	0.147		
SC	0.249	0.245	0.535	0.337		0.409	0.153		
RC	0.427	0.249	0.455	0.401	0.483	0.548	0.302		
BP	0.509	0.560	0.192	0.568	0.528	0.517	0.245	0.730	0.550

**Human Capital:** The overall result seems to suggest that there is no significant implementation of the HC, though respondents believe that HC affects MEU's BP. Empirical results indicated that the level of HC existing in MEU is below the average level compared with other organizations elsewhere. However, it seems that the MEU do not invest in developing HC. Developing HC has a strong relationship with leadership style and the overall IC management of MEU.

**Relational Capital:** Results indicated that there is no significant implementation of the RC variable, though they strongly believe that the RC variable affects MEU's BP. Empirical results indicated that the level of RC existing in MEU is below the average level compared with other organizations elsewhere. However, it seems that the MEU do not also invest in developing RC. Developing RC has a strong relationship with the level of investment and the overall IC management of MEU.

**Structural Capital:** The overall result seems to

suggest that there is no significant implementation of the SC variable; respondents believe that SC does not affect MEU's BP. It seems that respondents were neither aware of the role of SC variable in MEU's BP, nor do they believe that the SC variable affect MEU's BP. It appears that the respondents agree on the idea that the MEU has a lower level of SC. It also seems that the respondents agree on that the MEU has low interest level toward the entire SC variable.

**Relationships between IC Variables and MEU's BP:**

Pearson correlation matrix table showed that the relationships among the IC variables are strong, and the correlation between HC and SC is strong; and between HC and RC is strong. Moreover, the correlation between SC and RC is also strong. The results also showed that the relationship between IC variables and MEU's BP is strong, and very strong relationship between IC and MEU's BP. As shown in table (20) the above results are supported by many studies.

**Table (20): Correlation (r) Among Variables for Different Studies**

Variable	Current Study	Bontis 1999	Bin Ismail 2005	Sharabati <i>et. al.</i> 2010	Ahmadi <i>et. al.</i> 2011	Zargar <i>et. al.</i> 2012	Pahlavani 2012	Rafiei <i>et. al.</i> 2012	Djilali <i>et. al.</i> 2012	Darvisha <i>et. al.</i> 2013
HC-SC	0.596	0.492	0.524	0.659						0.33
SC-RC	0.713	0.197	0.555	0.699				0.841		0.455
HC-RC	0.526	0.499	0.510	0.687				0.846		0.47
HC-BP	0.582	0.483	0.520	0.647					0.383	0.06
SC-BP	0.499	0.508	0.501	0.557			0.76		0.391	0.355
RC-BP	0.654	0.639	0.641	0.670			0.45		0.550	0.545
IC-BP	0.668	0.544		0.698	0.595	0.730				

**Study Conclusion:**

Findings of the study supported the theory that IC has the potential to become the new source of wealth in higher education organizations, and that IC has a direct and positive effect on MEU's BP. These results are promising, because they revealed the possibility of investments in IC at a given point in time, it might have an influence on MEU's prosperity. In conclusion, it seems that MEU is still below the average when compared with the world-class organizations, in terms of the presence of the three variables of IC. Although respondents believe that HC and RC affect MEU's BP, however respondents do not believe that SC affects MEU's BP. Pearson correlation results showed that there is a strong and significant correlation among HC, SC and RC and they are strongly related to MEU's BP. This means that any activity done to improve the level of any IC component will have a significant effect on other components of IC and MEU's BP. It seems that the respondents moderately agree when expressing their opinion regarding MEU's BP improvement indicators. This indicates that the MEU is forward-looking organization.

In summary, changing the current situation and capitalizing the effort on the three elements together will result in a significant improvement in all aspects of the MEU's BP. The results indicated that managing the three IC

elements together i.e. synchronizing and synergizing them with each other, will lead to leveraging IC to the maximum level, and consequently producing the maximum performance improvement for MEU. All business leaders should understand and appreciate the power of IC effect on business performance. Implementing the suggested recommendations will further enhance the overall management and performance of MEU in future.

**Study Contribution:**

This research may be considered as an initiative research that deals with universities' IC in Jordan, and may be in Arab countries. To get maximum benefits from the subject, managing IC can be applied at three levels: First, at national level and this is called Social Capital. Second, at an organizational level, that is called IC, and can be applied for profitable or non-profitable organizations, whether private, public or government, and finally at an individual level that is called Brainpower. Therefore, the contributions of the current study might be important for individuals, organizations, government and society in general.

**Study Recommendations:****Recommendations for MEU:**

MEU has great potential for future performance



improvement. Nowadays, MEU are not too much behind other world-class universities, with the increase level of the presence of organizations' IC; MEU can improve and attain better performance. Based on the research findings, effective management will leverage IC, and then improve performance. In the light of research results, the following recommendations can be suggested:

1. The research results can help managers establish distinctive strategic positions. Building competitive strategies for managing IC is important, therefore, MEU should adopt an IC strategy. The adoption can be divided into four steps: First, identifying and evaluating the present IC in the organization. Second, matching the organization's revenues with IC assets that produce them. Third, developing a strategy for investing and exploiting the organization's IC assets. Finally, improving the efficiency and productivity of organization's workforce and processes.
2. The current management systems at MEU ought to be seriously re-evaluated. They must be managed by policies, systems and programs not by individuals.
3. The optimal procedure for MEU is to focus on all three components of IC in order to increase MEU's BP, since they enhance each other.
4. The elements of IC need to be integrated with the present recruitment criteria, promotion criteria, reward and recognition criteria, performance management criteria, leadership development programs, and organizational development programs.
5. Defining the role of IC in MEU in a formal way. It can be done by designing a map for IC in each organization. Then, conducting an initial IC screening to build IC portfolio, which determines the people and systems where IC resides.
6. Identifying key people in each department as IC champion. Managers at MEU would be responsible for preparing a plan for managing IC and linking it to the

organization's strategic goals. At the same time, MEU should consider the establishment of the post of Chief IC Management Officer (CICMO) who is responsible for designing, planning, implementing, monitoring and reviewing the whole IC management practices in MEU.

7. Employees' profiles: Making IC index to evaluate each employee through employees' test profile such as; Brainpower test and 360-degree test, which will provide feedback information about the competencies and capabilities of the staff for the purpose of their further development and training.
8. More co-operations among the universities and related institutions within the same industry i.e. promoting partnership culture among the Jordanian universities by establishing research and development partnerships, programs partnerships, universities' commercialization partnership.
9. Improving the relationships with other industries to share the benefit from the basic research, public science and management research, technology research, technology transfer and commercialization research.
10. Considering global strategic options for alliances, licensing, agreements and joint ventures. Also considering mergers and acquisitions within Jordanian universities, and considering diversification in the programs.

#### **Recommendations for Academics and Future Research:**

IC should be of interest to both academics and business practitioners, because the development and management of IC will require more dedication and effort in the future. Therefore, the researchers recommend the following for future research in the effect of IC on organizations' BP:

1. This study was directed towards MEU. Further empirical work is needed to test the degree to which the findings can be generalized to other universities and industries. Therefore, further testing with cross-sectional group from a wide variety of universities and industries will help mitigate the issue of generalizing conclusions on other universities or industries.
  2. This study was conducted in Jordan. Generalizing results of Jordanian setting to other countries is questionable. Further empirical researches involving data collection over diverse countries are needed. Moreover, comparative researches with other universities (local, regional and international) are necessary in the future.
  3. Similar research could be applied to other industries in order to find out whether the relations between IC and organizations' BP are similar to the current research results. This will serve to enrich the data and raise awareness of the importance of IC.
  4. Although most variables used in this research have high measurement reliability and validity, some variables may have room for further instrument refinement.
  5. Developing indicators that are linked to organizational strategy and value creation taking into account the indicators identified as the most useful in the current study.
  6. More co-ordination and co-operation between academic institutions and organizations especially between the basic and the secondary research are recommended.
- Finally, there is a need to analyze data of other organizations over a longer time in order to clearly test the assumptions of the IC method. The significant differences between organizations and/or industries could be explored by further studies. It is also recommended to work out researches that compare results with other developing countries' under similar assessment and measurement.

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.Factor Analysis

Cronbach's Alpha

Kolmogorov-Smirnov (K-S)

ANOVA T-TEST

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