The current issue and full text archive of this journal is available at
www.emeraldinsight.com/0025-1747.htm

Intellectual capital and business performance in the pharmaceutical sector of Jordan

Abdel-Aziz Ahmad Sharabati and Shawqi Naji Jawad
College of Administrative and Financial Studies, Amman Arab University, Amman, Jordan, and
Nick Bontis
DeGroote School of Business, McMaster University, Hamilton, Canada

Abstract

Purpose – The purpose of this study is to empirically test the relationship between intellectual capital (i.e. human capital, structural capital, relational capital) and business performance within the pharmaceutical sector of Jordan.

Design/methodology/approach – A valid research instrument was utilized to conduct a survey of 132 top- and middle-level managers from all 15 members of the Jordanian Association of Pharmaceutical Manufacturers.

Findings – A correlation and path analysis were conducted to ascertain the validity of the measures and models. Statistical support was found for the hypothesized relationships.

Research limitations/implications – The findings offer valuable insights on the generalizability of intellectual capital in a novel research setting.

Practical implications – Intellectual capital measurement is of primary interest for senior executives of pharmaceutical firms in Jordan.

Originality/value – The research reported is among only a few to investigate the issue of intellectual capital in Egypt and the first to study pharmaceutical firms.

Keywords Business performance, Intellectual capital, Human capital, Pharmaceuticals industry, Manufacturing systems, Jordan

Paper type Research paper

Introduction

Although intellectual capital may be a source of competitive advantage, generally speaking, most organizations do not understand its nature and value (Collis, 1996). Nevertheless, one of the first firms ever to report on their invisible assets was Skandia (Bontis, 1998). The field has since exploded with dozens of dedicated publications and academic researchers (see Serenko and Bontis, 2004, 2009; Bontis and Serenko, 2009 for comprehensive reviews and journal rankings).

The multidisciplinary nature of intellectual capital lends itself to both a richness of perspective as well as a difficulty for valuation (Bontis *et al.*, 1999) and relevance (Booker *et al.*, 2008). Facing intense globalized competition, there is a widespread recognition that intellectual capital is a critical force that drives economic growth (Huang and Liu, 2005).

One particular industry that is considered knowledge-intensive and a source of great intellectual capital is the pharmaceutical industry (Daum, 2005). This industry is research-intensive (DeVol *et al.*, 2004), highly innovative (Chen, 2004), well balanced in

Management Decision
Vol. 48 No. 1, 2010
pp. 105-131

0025-1747
DOI 10.1108/00251741011014481

its use of human intervention and technology (Hermans, 2004), and to a large extent dependent on its intellectual capital for a source of renewal (Zucker *et al.*, 1994). Ultimately, it is a great choice for analyzing intellectual capital components (Bollen *et al.*, 2005).

Much of the extant research on intellectual capital has focused on the developed world – specifically within Anglophonic and Scandinavian nations. However, this phenomenon has global appeal as evidenced in studies within Mexico (Trevinyo-Rodriguez and Bontis, 2007), Portugal (Cabrita *et al.*, 2007; Cabrita and Bontis, 2008), Ireland (O'Regan *et al.*, 2001; 2005), Germany (Kristandl and Bontis, 2007), Australia (Bontis and Girardi, 2000), Malaysia (Bontis *et al.*, 2000), Egypt (Seleim *et al.*, 2004, 2007) and others. Bontis (2004) points out that there is also great interest in intellectual capital development in the Arab region as well.

The pharmaceutical industry is an important and crucial sector in the Jordanian economy. Economically speaking, this sector represents the second largest in terms of exports after the phosphate industry (Hijjawi, 2006). The major difference between the phosphate industry and pharmaceutical industry is that Jordan sells phosphate as a raw material, while in the pharmaceutical industry it imports raw materials and processes them into finished products to be exported. The process of commercializing pharmaceuticals is very knowledge-intensive and thus provides a fruitful setting for intellectual capital assessment.

The research setting for this particular study is unique because the concept of intellectual capital is not well known to most managers in the pharmaceutical industry in Jordan. Therefore, the expected contributions of this research are as follows:

(1) Whereas intellectual capital measurement studies often focus on accounting measures and financial calculations (e.g., VAIC), these require publicly traded companies whose results are fully disclosed and available. This particular study encompasses both public and private pharmaceutical companies.

(2) This study represents one of only a handful in the extant literature to focus on the Arab region and the first one to focus on measuring intellectual capital development in this particular sector in Jordan. It thus offers a novel perspective.

(3) This research is an extension of the study conducted by Seleim *et al.* (2004) which focused on software companies in Egypt. The results here may allow for generalizability across different countries and industries.

(4) A large proportion of intellectual capital measurement studies examine first-level constructs (e.g., human capital, structural capital, and relational capital). This particular study digs deeper by examining sup-phenomena within each of the first-level constructs. It thus offers a more granular perspective of intellectual capital measurement.

(5) PLS-Graph software is used as the structural equation modelling technique in this research study. This same software has been used in many previous studies, which allows for the direct comparison of results to determine potential differences attributed to the novel context of this particular research setting.

Ultimately, the purpose of this research study is to measure the effect of intellectual capital elements on the business performance of Jordanian pharmaceutical firms.

Literature review

Much of the literature on intellectual capital stems from an accounting and financial perspective (Bontis, 2001). Many of these researchers are interested in answering the following two questions:

(1) What is causing firms to be worth so much more than their book value?

(2) What specifically is in this intangible asset?

Stewart (1997) defines intellectual capital as the intellectual material that has been formalized, captured, and leveraged to create wealth by producing a higher-valued asset. Following the work of Edvinsson and Malone (1997), Sveiby (1997), Roos *et al.* (1997), Bontis (1999), O'Donnell *et al.* (2004, 2006), Sällebrant *et al.* (2007), Curado and Bontis (2007) among others, intellectual capital is defined as encompassing:

- human capital;
- structural capital; and
- relational capital.

These sub-phenomena encompass the intelligence found in human beings, organizational routines and network relationships respectively. This field typically looks at organizational knowledge as a static asset in an organization – a so-called stock. This concerns many theorists who are also interested in the flow of knowledge. Furthermore, intellectual capital research does not cater to changes in cognition or behaviour of individuals which is necessary for learning and improvement. Naturally, the field of knowledge management dovetails nicely as it focuses on the flow of information (Curado and Bontis, 2006).

To understand the intellectual capital imbedded in an organization requires organizational members to assess their core competencies; those areas where they can achieve or have achieved "best-in-the-world" status. The intellectual capital of an organization represents the wealth of ideas and ability to innovate which will determine the future of the organization. Why have management accountants and financial analysts avoided this area until recently? The most obvious answer is that intellectual capital is not only difficult to measure but also difficult to evaluate. In the past, accountants have assumed a position which either ignores the problems or writes them off as impossible to solve (Luscombe, 1993; Bontis, 2003). It is important to realize that intellectual capital is real and provides value (Andreou and Bontis, 2007). One need only look at the hackneyed example of Microsoft whose accounting book value is significantly less than its market value based on share price to see that there must be some explanation of this "excess" market valuation. Arguably this "excess" is the market valuation of the intellectual capital stocks and organizational learning flows of the company.

Research model

Figure 1 outlines the proposed research model of this study. Essentially, this model posits that there is a direct and positive association between intellectual capital and business performance (Stewart, 1997). By subdividing the higher-order construct of intellectual capital into its three components human capital, structural capital and relational capital; the first proposed hypothesis is as follows:

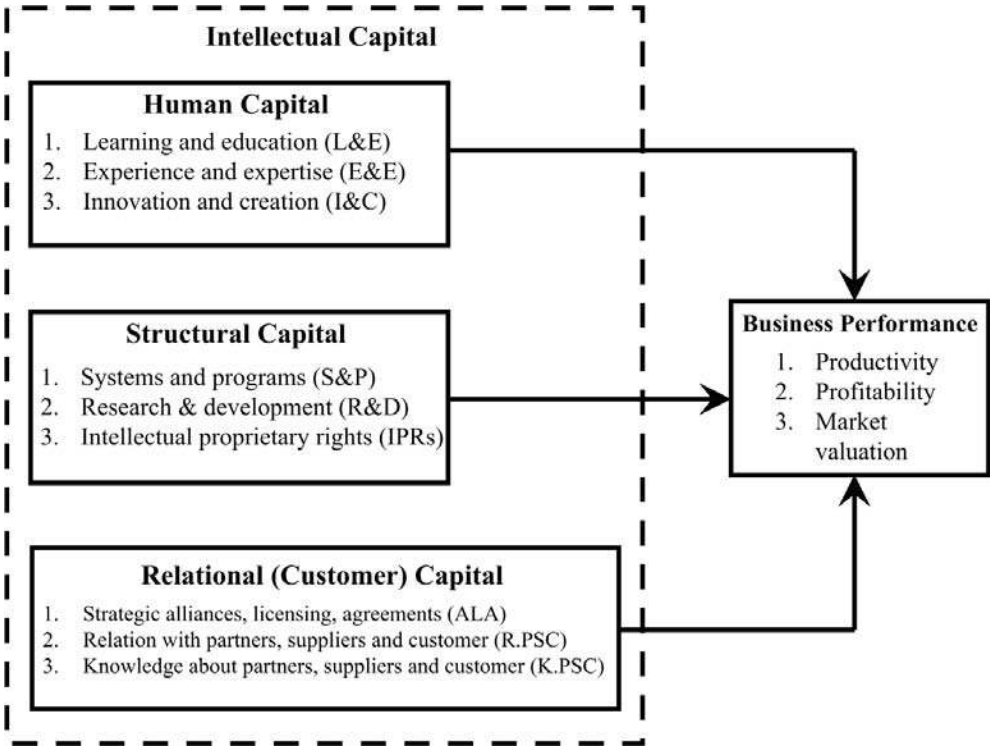

Figure 1.
Conceptual model

H1. Intellectual capital is positively influenced by human capital, structural capital and relational capital.

EQ1. $\text{Intellectual capital} = \beta_0 + \beta_1(\text{HC}) + \beta_2(\text{SC}) + \beta_3(\text{RC})$

where: HC = human capital, SC = structural capital, RC = relational capital
β_1, β_2, β_3 are expected to be > 0

By further subdividing the three primary constructs of intellectual capital, the second through fourth hypotheses posit the positive influence that these summative sub-components possess. First human capital is defined as the accumulated value of investments in the employee's training and competence (Edvinsson and Malone, 1997). It also contains the competence, skills, and intellectual agility of the individual employees (Roos *et al.*, 1997). Zambon (2002) adds that human capital includes the collective knowledge, creativity and innovativeness of people within an organization. Therefore, the following hypothesis is proposed:

H2. Human capital is positively influenced by innovation & creation, learning & education, and experience and expertise.

EQ2. $\text{Human capital} = \beta_0 + \beta_1(\text{I\&C}) + \beta_2(\text{L\&E}) + \beta_3(\text{E\&E})$

where: I&C = innovation & creation, L&E = learning & education
E&E = experience and expertise
β_1, β_2, β_3 are expected to be > 0

Structural capital consists of the non-human storehouses of knowledge in an organization that are embedded in systems, databases and programs (Edvinsson and

Malone, 1997). Unlike human capital, structural capital is an intangible asset that can be traded, reproduced and shared within the firm (Zambon, 2002). In fact, certain structural capital elements can be legally protected in the form of patents and trademarks as a result of investment in research and development (Roos *et al.*, 1997). However, Choo and Bontis (2002) argue that intellectual property and intellectual capital are mutually exclusive. Therefore, the following hypothesis is proposed:

H3. Structural capital is positively influenced by systems & programs, research & development, and inversely influenced by intellectual property rights.

EQ3. Structural Capital $= \beta_0 + \beta_1(\text{S\&P}) + \beta_2(\text{R\&D}) - \beta_3(\text{IPR})$.

where: S&P = systems & programs, R&D = research & development, IPR = intellectual property rights
β_1, β_2 are expected to be > 0, β_3 is expected to be < 0

Relational capital represents all the knowledge embedded in relationships with external parties such as customers, suppliers, partners and other external stakeholders (Roos *et al.*, 1997). However Roos and his colleagues also describe an important distinction between the actual relationship between these stakeholders and the knowledge about these stakeholders. Zambon (2002) further extends this notion to include formal alliances, licensing and partner agreements as evidence of these external relationships. Therefore, the following hypothesis is proposed:

H4. Relational capital is positively influenced by relations and knowledge about partners, suppliers and customers, in addition to alliances, licensing and agreements.

EQ4. Relational capital $= 0.548 + 0.622$ (R.PSC) $+0.184$ (K.PSC) $+0.016$ (ALA)

where: R.PSC = relations with partners, suppliers and customers
K.PSC = knowledge about partners, suppliers and customers
ALA = alliances, licensing and agreements

Study design and methodology

There were 15 organizations that were registered in the Jordanian Association of Pharmaceutical Manufacturers (JAPM) in 2007. The entire population was chosen to explore the topic of intellectual capital, thus negating any need for sampling. The survey unit of analysis was composed of all top and middle managers drawn from the JAPM population. Financial information was also collected from annual reports, journals, books, and trade magazines. Primary information was also collected from expert interviews, and a pilot study conducted by the research team.

The use of perceptual measures in intellectual capital research has been studied extensively by Kannan and Aulbur (2004). They argue that perceptual measures are often used to examine organizational factors that contribute to employee performance, human capital development and organizational performance. By analyzing over 100 research papers in the field of intellectual capital, Kannan and Aulbur (2004) determined that perceptual measures were among the most often used measurement techniques. Although objective measures are often found to be less susceptible to respondent bias, there is evidence that shows that both perceptual and objective measures of

knowledge-based assets are often congruent. In fact the use of perceptual measures for both exogenous and endogenous constructs would tend to balance out any over-inflated response bias. Given that intangible assets are difficult to measure objectively, it is common to find the use of proxy metrics and perceptual measures (Kannan and Aulbur, 2004). In a study of intellectual capital development and its link to performance in the mutual fund industry (Bontis *et al.*, 2002), perceptual measures (i.e. survey items) and objective metrics (i.e. ROR = profit divided by revenue) of performance were found to have a significantly positive association ($r = 0.371$, $p < 0.01$).

The survey instrument was based on Bontis' intellectual capital questionnaire (Bontis, 1998). Intellectual capital was sub-divided into three elements: human capital, structural capital and relational capital. Each sub-construct was operationalized with ten items that measured employees' perception of that variable. The dependent variable in the study was business performance which was measured using ten items. All items were measured with a five-point Likert-type scale.

The questionnaire was validated through expert interviews and a panel of judges. Interviews with ten experts were conducted to collect information about intellectual capital measurement tools, models and JAPM organizations' profiles. To finalize the items, the research team conducted two rounds of review with a panel of judges: the first round was with 18 academics and professionals from different Jordanian universities and pharmaceutical organizations. The second round was conducted with language professionals who were employed to revise the study instrument to ensure the use of clear language. Finally, one respondent from each of the 15 JAPM organizations was invited to participate in the pilot study. The initial results were used to test and evaluate the normality, reliability and validity of the survey instrument.

Surveys were mailed to 200 top and middle-level managers within the 15 JAPM firms. Of those, 140 were returned for a response rate of 70 percent. This relatively high response rate is attributable to the explicit support received from the head of JAPM which represents the total sample of organizations targeted. The actual number of surveys used in the analysis was 132 since eight surveys were incomplete.

Results

In order to test for the normal distribution of response data, a Kolmogorov-Smirnov (K-S) test for all dependent and independent variables was conducted. All of the items were confirmed to be normally distributed. Cronbach's alpha was used to test the reliability of the measures. For the pilot study, Cronbach's alpha results ranged between 0.75 and 0.95 for each construct which is acceptable. The Cronbach's alpha results for the actual study ranged between 0.78 and 0.90. These values are in line with the results of Bollen *et al.* (2005), Bontis (1998), Miller *et al.*(1999), Moslehi *et al.*(2006) and Bin Ismail (2005).

Two methods were used to confirm validity. First, face validity was tested by interviewing the experts and panel of judges during the test pilot phase. Second, factor analysis (i.e. Pearson's principal component analysis) was conducted with and without rotation (i.e. Varimax rotation with Kaiser normalization). All variable and sub-variable items were confirmed valid since their factor loading values were more than 0.4. This result mirrors previous studies conducted by Bontis (1998), Bollen *et al.*(2005) and Bin Ismail (2005).

Pearson's bi-variate correlation coefficient was used to test the relationship between independent and dependent variables. The result showed that the intellectual capital

variables and sub-variables had a substantive and significant relationship with business performance. An ANOVA test was then used to analyze respondents' characteristics related to gender, age, education, experience, department and sector. Before conducting multiple regression analysis, a test of multi-collinearity using the VIF (variance inflation factor) was also conducted.

Finally, Partial Least Squares (PLS-Graph v. 3.00) was used to test the conceptual model and relationships among independent variables and the dependent variable. PLS is a structural equation modeling technique typically chosen for handling relatively small data samples. It as been used as a research tool in a variety of research settings such as global strategy, risk-return outcomes, geographic scope and in intellectual capital research (Bontis and Serenko, 2009). Although not so well-known a modeling technique as LISREL, for instance, PLS has as its primary objective the minimisation of error (Hulland, 1999). The degree to which any particular PLS model accomplishes this objective can be determined by examining the *R*-squared values for the dependent (endogenous) constants. Unlike LISREL, PLS does not report fit indices but is used to examine the validity of beta path values and the explanatory power of the overall model (*R*-squared).

Common method bias is of particular concern when survey respondents are asked to fill out items that tap into both independent and dependent variables. There are two tests that may be utilized to conduct a test of common method bias: Harman's one-factor test (Podsakoff and Organ, 1986) and a fully saturated causal model (Williams *et al.*, 2003). To perform Harman's single-factor test, all variables – both dependent and independent – are entered into the model. The results of an un-rotated solution should are analyzed to determine the number of actual factors that emerge. Common method bias is present if a single or general factor appears that accounts for the majority of variables. This was not the case in this study as a one-factor model of the un-rotated solution explained only 27.1 percent of variance. A fully saturated model was also developed in which all indicators are linked to all constructs. The results of this test also show that common method bias was not present because item loadings were generally found to be statistically insignificant with unrelated constructs.

The starting-point for evaluating the validity of the survey was Bontis' (1998) instrument which originally contained ten items per construct. However, many of these items failed the proper psychometric evaluation benchmarks. This can be attributable to two reasons:

(1) Bontis' (1998) original research setting was financial services firms in Canada and the present research context is entirely different; and

(2) there may have been some slight meaning lost in translation from English to Arabic.

The remaining items selected in this study were ones that past tests for reliability, composite validity and discriminant validity (Fornell and Larcker, 1981).

Table I depicts the mean scores of each variable and its corresponding construct. Generally speaking, all items scored in the affirmative (1 = strongly disagree, 5 = strongly agree, with 3 the mid-point) with mean values greater than 3.0. The only item below the mid-point was the use of intellectual property at 2.80. These affirmative results were contrasted with previous studies conducted by Seleim *et al.* (2007), Miller *et al.* (1999), Sofian *et al.* (2004), Bin Ismail (2005), Salleh and Salamat (2007), Moslehi

	Mean	Std. dev.	*t*-value
Intellectual capital variables			
Learning and education	3.58	0.563	11.768
Experience and expertise	3.45	0.525	9.906
Innovation and creation	3.27	0.642	4.880
Human capital	3.43	0.520	9.589
Systems and programs	3.17	0.688	2.897
Research & development	3.20	0.809	2.905
Intellectual property rights	2.80	0.910	-2.544
Structural capital	3.06	0.654	1.034
Alliances, licensing and agreements	3.39	0.752	5.993
Relationship with partners, suppliers and customers	3.59	0.612	11.136
Knowledge about partners, suppliers and customers	3.37	0.622	6.870
Relational capital	3.45	0.550	9.447
Intellectual capital	3.32	0.510	7.095
Business performance variables			
Industry leadership	3.48	0.886	6.186
Future outlook	3.95	0.927	11.734
Overall response to competition	3.39	0.889	5.092
Success rate in new product launches	3.30	0.931	3.647
Overall business performance & success	3.54	0.833	7.422
Employee productivity	3.37	0.785	5.430
Process (transaction) productivity	3.38	0.737	5.909
Sales growth	3.39	0.946	4.691
Profit growth	3.45	0.944	5.442
Company market valuation (stock value)	3.33	0.904	4.141

Table I.
Statistical results of summary variables

et al. (2006), Berglund *et al.* (2002), Lim (2002), Kukko *et al.* (2003), Bollen *et al.* (2005), Bontis (1998), Bontis *et al.* (2000), Bontis and Fitz-enz (2002), Firer and Stainbank (2003), Tomer (2005), Xiaojun (2004), Seng *et al.* (2004), Westhuizen (2005), Chen (2004), Gallego and Rodriguez (2005), Heimeriks and Duysters (2003), and Cuganesan (2005).

Table II contrasts the results of this particular study with the variable mean scores of previous intellectual capital studies. A quick scan of these results clearly indicates a consistency of values for intellectual capital scores regardless of sectoral or country context. This bodes well for the generalizability of results. Table III represents a correlation matrix across all variables with all values being statistically significant ($p < 0.01$). The explanatory power (R^2) of each construct within its nomological network is presented in Table IV which contrasts values from previous studies. Once again we see generalizability across various settings. Table V depicts the correlations among constructs and contrasts these values with previous studies.

The results related to path analysis showed that the three sub-constructs of intellectual capital together have a positive and substantive association with business performance which was on par with previous studies. The relationship between the dependent variable of intellectual capital and its sub-constructs derived by this model can be expressed with the following equation:

EQ1. Intellectual capital = 0.259 + 0.411 (HC) +0.054 (SC) +0.469 (RC)

where: HC = human capital, SC = structural capital, RC = relational capital.

Variable	Current study Jordan	Bontis (1998) Canada	Miller *et al.* (1999) Canada	Berglund *et al.* (2002) Sweden	Sofian *et al.* (2004) Malaysia	Bin Ismail (2005) Malaysia	Moslehi *et al.* (2006) Iran	Salleh and Salamat (2007) Malaysia
Human capital	3.43	4.02	3.63	3.15	3.94	3.36	3.15	3.71
Structural capital	3.06	4.08	2.80	1.85	3.58	3.39	2.23	3.62
Relational capital	3.45	4.18	3.47		3.89	3.36	3.85	3.83
Intellectual capital	3.32	4.09	3.30		3.80	3.37	3.08	3.72
Business performance	3.46	6.52	3.02		3.20	3.01	2.40	

Note: The original survey instrument used by Bontis (1998) was a seven-point Likert-type scale for the intellectual capital constructs and a ten-point Likert-type scale for the business performance construct

Table II.
Comparison among mean scores across previous studies

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1	L&E													
2	E&E	0.712												
3	I&C	0.701	0.745											
4	HC	0.889	0.900	0.915										
5	S&P	0.636	0.586	0.753	0.737									
6	R&D	0.546	0.498	0.579	0.603	0.631								
7	IPR	0.282	0.313	0.291	0.327	0.339	0.517							
8	SC	0.579	0.557	0.638	0.659	0.769	0.874	0.796						
9	ALA	0.419	0.362	0.418	0.445	0.419	0.498	0.458	0.565					
10	R.PCS	0.632	0.509	0.619	0.654	0.604	0.535	0.298	0.571	0.461				
11	K.PCS	0.603	0.529	0.600	0.643	0.596	0.513	0.406	0.609	0.462	0.711			
12	RC	0.652	0.553	0.646	0.687	0.640	0.619	0.472	0.699	0.801	0.849	0.851		
13	IC	0.784	0.742	0.816	0.868	0.808	0.800	0.621	0.902	0.680	0.711	0.784	0.891	
14	BP	0.564	0.534	0.641	0.647	0.598	0.550	0.258	0.557	0.375	0.729	0.609	0.670	0.698

Table III.
Correlation matrix

Note: All correlation values are significant at the 0.01 level (two-tailed)

The coefficients show that the relational capital construct has the most substantive association with its higher order construct. Several lower order models were then tested to evaluate how the items would load on to their respective constructs as follows:

EQ2. Human capital = 0.919 + 0.464 (I&C) +0.243 (L&E) +0.435 (E&E).

where: I&C = innovation & creation, L&E = learning & education
E&E = experience and expertise.

EQ3. Structural capital = 1.521 + 0.390 (S&P) +0.245 (R&D) − 0.031 (IPR).

where: S&P = systems & programs, R&D = research & development,
IPR = intellectual property rights.

EQ4. Relational capital = 0.548 + 0.622 (R.PSC) +0.184 (K.PSC) +0.016 (ALA).

where: R.PSC = relations with partners, suppliers and customers
K.PSC = knowledge about partners, suppliers and customers
ALA = alliances, licensing and agreements.

From *EQ2*, it is determined that innovation and creation (0.464) plays a dominant role in describing the latent construct of human capital. From *EQ3*, systems and programs (0.390) have the largest coefficient whereas intellectual property rights has a negative value (−0.031). This negative result is expected since various authors (see Choo and Bontis, 2002; Bontis, 2002) have argued that intellectual property and intellectual capital are in fact mutually exclusive with the former representing assets that are legally protectable (e.g. patents, copyrights, trademarks) and the latter not (e.g. ideas, trade secrets). From *EQ4*, relations with partners, suppliers and customers (0.622) is the strongest indicator of the latent construct relational capital.

Implications for research

The results of this study have shown that there is in fact strong and positive evidence that pharmaceutical firms in Jordan are managing intellectual capital effectively and

Construct	Variable	Current study	Bontis (1998)	Bontis *et al.* (2000)[a]	Bontis *et al.* (2000)[b]	Bollen *et al.* (2005)	Wang Chang (2005)	Wang Chang (2005)
HC	Independent	0.419				0.522	0.344	
SC	Independent	0.309	0.249	0.580	0.842	0.535	0.337	
RC	Independent	0.450	0.245	0.637	0.639	0.455	0.401	0.483
BP	Dependent	0.517	0.560	0.069	0.011	0.192	0.568	0.528

Notes: [a] Service industry sample; [b] Non-service industry sample

Table IV.
Explanatory power (R^2) compared with previous studies

that in turn is influencing business performance positively. The results of this study have also corroborated previous research that has taken place in different national and industry contexts. It is argued that the generalizability of these results is supported with confidence due to the full sampling of the JAPM organizations. The following recommendations are for future academic research:

(1) This particular study was directed towards the managers of JAPM organizations and as such, data was collected from a specific level of the organizational hierarchy. To test the robustness of the findings, it would be wise to consider surveying front-line employees as well boards of directors.

(2) Although this study focused on the pharmaceutical industry specifically, there is ample opportunity to study other knowledge-intensive industries in Jordan (e.g. software development, consulting, retail). Further empirical work is needed to test the degree to which the findings can be generalized to other industries.

(3) A unique contribution of this study is the testing of intellectual capital concepts within Jordan. There are several other countries both in the Middle East and elsewhere that would benefit testing these concepts in a non-Anglophonic setting.

(4) Although most variables used in this research have high reliability and validity as tested in several previous contexts, there is always opportunity for refinement, especially when survey instruments require translation.

(5) One can also exploring the usefulness of studying other possible constructs that would influence intellectual capital such a brand, reputation and gender empowerment.

(6) Developing an important consideration in this study is the absence of lag time when determining the influence that constructs have on business performance. To assess the timing of this relationship, one has to examine these variables longitudinally over time.

Implications for practice

In the light of the academic research results, the following recommendations can be suggested for practitioners:

(1) When developing an intellectual capital strategy, it is important to consider the relative importance of variables within each construct. For example, systems and programs is fundamentally the most important measure within the latent construct of structural capital.

Paired constructs	Current study	Bontis (1998)	Bin Ismail (2005)
HC-SC	0.659*	0.492*	0.524*
SC-RC	0.699*	0.197	0.555*
HC-RC	0.687*	0.499*	0.510*
HC-BP	0.647*	0.509*	0.520*
SC-BP	0.557*	0.508*	0.501*
RC-BP	0.670*	0.639*	0.641*

Note: *Correlation is significant at the 0.01 level (two-tailed)

Table V.
Correlations among constructs for different studies

(2) The optimal procedure for JAPM organizations is to focus their efforts on managing all three components of intellectual capital in order to increase their business performance.

(3) When comparing these Jordanian results to other studies, it is important to note that Structural Capital was the lowest mean score construct within Jordan as well as across most other countries. The implication here is that JAPM organizations must increase their investment in telecommunications and collaborative information technology tools that can help codify tacit knowledge. At present, the gap between human capital (3.43) and structural capital (3.06) is relatively high which provides insight as to the challenges that JAPM organizations face in converting the expertise that's inside employees' minds into the systems and structures of the firm.

(4) It is recommended that organizations identify key people and assign them the role as intellectual capital champion. This individual would be responsible for preparing a plan for managing intellectual capital and linking it to the organization's strategic goals. At the same time, JAPM organizations should consider the establishment of the post of Chief Intellectual Capital Management Officer (CICMO) or Chief Knowledge Officer (CKO).

(5) Leadership development and training programs within JAPM organizations should include a focus on the issue of intellectual capital measurement and management.

(6) JAPM organizations would be wise to establish a consortium network in which they would benchmark relative measures of intellectual capital against each other on a consistent basis. This is a viable option given the relatively small number of members at this point.

(7) JAPM organizations should consider the publication of an intellectual capital report so that management is inclined to monitor this phenomenon while at the same time preparing traditional financial statements.

To get the maximum benefits from the concept of intellectual capital, it should be considered at all four levels: individual, group, organization and country. In a study sponsored by the United Nations, Jordan was identified as a nation with high levels of human capital but relatively low levels of process (structural) capital (Bontis, 2004). It is important for the Jordanian government to harvest the full potential of its people by investing in appropriate technological infrastructure so that human capital can be converted (or processed) into increased wealth and a higher standard of living. This can be achieved for organizations regardless of size (Serenko *et al.*, 2007).

Social capital is the capacity of a nation to create and develop entrepreneurs, inventors, innovators and leaders. Social capital improves the capabilities of individuals and organizations for future benefits. It emphasizes high co-operation among society members, government, academic institutions, and organizations.

The concept of intellectual capital is a newly emerging concept, and until now, it is not fully understood by most organizations in Jordan or the Arab world. This study represents a major foundation in elevating this concept within the Jordanian business community. As such it represents (to the best of the authors' knowledge) only the third piece of Anglophonic research focused on an Arab country since Seleim *et al.* (2004, 2007) studied software firms in Egypt.

References

Andreou, A. and Bontis, N. (2007), "A model for resource allocation using operational knowledge assets", *The Learning Organization: An International Journal*, Vol. 14 No. 4, pp. 345-74.

Berglund, R., Grönvall, T., Johnson, M. and Edvinsson, L. (2002), "Intellectual capital's leverage on market value", unpublished Master's thesis, Lund School of Economics and Management, Lund University, Lund.

Bin Ismail, M. (2005), "The influence of intellectual capital on the performance of Telekom Malaysia (Telco)", unpublished Doctoral dissertation, Business & Advanced Technology Centre, University of Technology Malaysia, Skudai.

Bollen, L., Vergauwen, P. and Schnieders, S. (2005), "Linking intellectual capital and intellectual property to company performance", *Management Decision*, Vol. 43 No. 9, pp. 1161-85.

Bontis, N. (1998), "Intellectual capital: an exploratory study that develops measures and models", *Management Decision*, Vol. 36 No. 2, pp. 63-76.

Bontis, N. (1999), "Managing organizational knowledge by diagnosing intellectual capital: framing and advancing the state of the field", *International Journal of Technology Management*, Vol. 18 Nos 5-8, pp. 433-62.

Bontis, N. (2001), "Assessing knowledge assets: a review of the models used to measure intellectual capital", *International Journal of Management Reviews*, Vol. 3 No. 1, pp. 41-60.

Bontis, N. (2002), *World Congress on Intellectual Capital Readings*, KMCI Butterworth-Heinemann Press, Boston, MA.

Bontis, N. (2003), "Intellectual capital disclosure in Canadian corporations", *Journal of Human Resource Costing and Accounting*, Vol. 7 Nos 1/2, pp. 9-20.

Bontis, N. (2004), "National Intellectual Capital Index: a United Nations initiative for the Arab region", *Journal of Intellectual Capital*, Vol. 5 No. 1, pp. 13-39.

Bontis, N. and Fitz-enz, J. (2002), "Intellectual capital ROI: a causal map of human capital antecedents and consequents", *Journal of Intellectual Capital*, Vol. 3 No. 3, pp. 223-47.

Bontis, N. and Girardi, J. (2000), "Teaching knowledge management and intellectual capital lessons: an empirical examination of the TANGO simulation", *International Journal of Technology Management*, Vol. 27 Nos 5-8, pp. 545-55.

Bontis, N. and Serenko, A. (2009), "A follow-up ranking of academic journals", *Journal of Knowledge Management*, Vol. 13 No. 1.

Bontis, N., Crossan, M. and Hulland, J. (2002), "Managing an organizational learning system by aligning stocks and flows", *Journal of Management Studies*, Vol. 39 No. 4, pp. 437-69.

Bontis, N., Keow, W. and Richardson, S. (2000), "Intellectual capital and the nature of business in Malaysia", *Journal of Intellectual Capital*, Vol. 1 No. 1, pp. 85-100.

Bontis, N., Dragonetti, N., Jacobsen, K. and Roos, G. (1999), "The knowledge toolbox: a review of the tools available to measure and manage intangible resources", *European Management Journal*, Vol. 17 No. 4, pp. 391-402.

Booker, L., Bontis, N. and Serenko, A. (2008), "The relevance of knowledge management and intellectual capital research", *Knowledge and Process Management*, Vol. 15 No. 4, pp. 235-46.

Cabrita, M. and Bontis, N. (2008), "Intellectual capital and business performance in the Portuguese banking industry", *International Journal of Technology Management*, Vol. 43 Nos 1-3, pp. 212-37.

Cabrita, M., Landeiro de Vaz, J. and Bontis, N. (2007), "Modelling the creation of value from intellectual capital: a Portuguese banking perspective", *International Journal of Knowledge and Learning*, Vol. 3 Nos 2/3, pp. 266-80.

Chen, M.C. (2004), "Intellectual capital and competitive advantages: the case of TTY", *Journal of Business Chemistry*, Vol. 1 No. 1, pp. 14-20.

Choo, C.W. and Bontis, N. (2002), *The Strategic Management of Intellectual Capital and Organizational Knowledge*, Oxford University Press, New York, NY.

Collis, D.J. (1996), "Organizational capability as a source of profit", in Moingeon, B. and Edmondson, A. (Eds), *Organizational Learning and Competitive Advantage*, Sage, London.

Cuganesan, S. (2005), "Intellectual capital-in-action and value creation: a case study of knowledge transformations in an innovation project", *Journal of Intellectual Capital*, Vol. 6 No. 3, pp. 357-73.

Curado, C. and Bontis, N. (2006), "The knowledge based-view of the firm and its theoretical precursor", *International Journal of Learning and Intellectual Capital*, Vol. 3 No. 4, pp. 367-81.

Curado, C. and Bontis, N. (2007), "Managing intellectual capital: the MIC Matrix", *International Journal of Knowledge and Learning*, Vol. 3 Nos 2/3, pp. 316-28.

Daum, J.H. (2005), "Intangible assets-based enterprise management: a practical approach", *Proceedings of 2005 PMA IC Symposium, Stern School of Business, New York University, Manhattan, 15 December 2005*.

DeVol, R.C., Wong, P., Bedroussian, A., Wallace, L., Ki, J., Murphy, D. and Koepp, R. (2004), *Bio-Pharmaceutical Industry Contributions to State and US Economics*, Milken Institute, San Diego, CA.

Edvinsson, L. and Malone, M. (1997), *Intellectual Capital: Realising Your Company's True Value by Finding its Hidden Brainpower*, HarperCollins, New York, NY.

Firer, S. and Stainbank, L. (2003), "Testing the relationship between intellectual capital and a company's performance: evidence from South Africa", *Meditari Accountancy Research*, Vol. 11, pp. 25-44.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

Gallego, I. and Rodriguez, L. (2005), "Situation of intangible assets in Spanish firms: an empirical analysis", *Journal of Intellectual Capital*, Vol. 6 No. 1, pp. 105-26.

Heimeriks, K.H. and Duysters, G.M. (2003), "Alliance capability as mediator between experience and alliance performance: an empirical investigation into the alliance capability development process", ECIS Working Papers 03.18, Department of Technology Management, Eindhoven.

Hermans, R. (2004), *International Mega-Trends and Growth Prospects of the Finnish Biotechnology Industry*, ETLA – The Research Institute of the Finnish Economy, Helsinki.

Hijjawi, A. (2006), *Data Bank*, The Jordanian Association of Pharmaceutical Manufacturers, Amman.

Huang, C.J. and Liu, C.J. (2005), "Exploration for the relationship between innovation, IT and performance", *Journal of Intellectual Capital*, Vol. 6 No. 2, pp. 237-52.

Hulland, J.S. (1999), "Use of Partial Least Squares (PLS) in strategic management research: a review of four recent studies", *Strategic Management Journal*, Vol. 20 No. 2, pp. 195-204.

Kannan, G. and Aulbur, W. (2004), "Intellectual capital: measurement effectiveness", *Journal of Intellectual Capital*, Vol. 5 No. 3, pp. 389-413.

Kristandl, G. and Bontis, N. (2007), "Defining intangible assets and intellectual capital", *Management Decision*, Vol. 45 No. 9, pp. 1510-24.

Kukko, M., Hannula, M. and Okkonen, J. (2003), "The state of intellectual capital management in the Finnish Top 50 companies", *Proceedings of I-Know, Gram, Finland, July 4*.

Lim, L.L.K. (2002), "Human capital: an examination of the indicators from two perspectives", working paper, Aberystwyth University, Aberystwyth.

Luscombe, N. (1993), "A learning experience", *CA Magazine*, February, p. 3.

Miller, M., DuPont, B.D., Fera, V., Jeffrey, R., Mahon, B., Payer, B.M. and Starr, A. (1999), "Measuring and reporting intellectual capital from a diverse Canadian industry perspective: experiences, issues and prospects", *Proceedings of the OECD Symposium, Amsterdam, June 9-11*.

Moslehi, A., Mohagharl, A., Badie1, K. and Lucas, C. (2006), "Introducing a toolbox for IC measurement in the Iran insurance industry", *The Electronic Journal of Knowledge Management*, Vol. 4 No. 2, pp. 169-80.

O'Donnell, D., Bontis, N., O'Regan, P., Kennedy, T., Cleary, P. and Hannigan, A. (2004), "CFOs in eBusiness: eArchitects or foot-soldiers?", *Knowledge and Process Management*, Vol. 11 No. 2, pp. 105-16.

O'Donnell, D., Tracey, M., Henriksen, L.B., Bontis, N., Cleary, P., Kennedy, T. and O'Regan, P. (2006), "On the 'essential condition' of intellectual capital-labour", *Journal of Intellectual Capital*, Vol. 7 No. 1, pp. 111-28.

O'Regan, P., O'Donnell, D., Kennedy, T., Bontis, N. and Cleary, P. (2001), "Perceptions of intellectual capital: Irish evidence", *Journal of Human Resource Costing and Accounting*, Vol. 6 No. 2, pp. 29-38.

O'Regan, P., O'Donnell, D., Kennedy, T., Bontis, N. and Cleary, P. (2005), "Board composition, non-executive directors and governance cultures in Irish ICT firms: a CFO perspective", *Corporate Governance: International Journal of Business in Society*, Vol. 5 No. 4, pp. 56-63.

Podsakoff, P.M. and Organ, D.W. (1986), "Self-report in organizational research: problems and prospects", *Journal of Management*, Vol. 12 No. 4, pp. 531-44.

Roos, J., Roos, G., Dragonetti, N.C. and Edvinsson, L. (1997), *Intellectual Capital: Navigating in the New Business Landscape*, Macmillan, Basingstoke.

Sällebrant, T., Hansen, J., Bontis, N. and Hofman-Bang, P. (2007), "Managing risk with intellectual capital statements", *Management Decision*, Vol. 45 No. 9, pp. 1470-83.

Salleh, A. and Selamat, F. (2007), "Intellectual capital management in Malaysian public listed companies international", *Review of Business Research Papers*, Vol. 3 No. 2, pp. 262-74.

Seleim, A., Ashour, A. and Bontis, N. (2004), "Intellectual capital in Egyptian software firms", *The Learning Organization: An International Journal*, Vol. 11 Nos 4/5, pp. 332-46.

Seleim, A., Ashour, A. and Bontis, N. (2007), "Human capital and organizational performance: a study of Egyptian software companies", *Management Decision*, Vol. 45 No. 4, pp. 789-901.

Seng, J.L., Lin, T.H. and Chaing, S.W. (2004), "An exploratory set of indicators between information technology and process capital and innovation capital: based on a sample case", International Forum of Intellectual Capital in Taiwan (NICRC), National Chengchi University, Taiwan.

Serenko, A. and Bontis, N. (2004), "A model of user adoption of mobile portals", *Quarterly Journal of Electronic Commerce*, Vol. 4 No. 1, pp. 69-98.

Serenko, A. and Bontis, N. (2009), "Global ranking of knowledge management and intellectual capital academic journals", *Journal of Knowledge Management*, Vol. 13 No. 1.

Serenko, A., Bontis, N. and Hardie, T. (2007), "Knowledge flow and organizational size: a proposed theoretical link", *Journal of Intellectual Capital*, Vol. 8 No. 4, pp. 610-27.

Sofian, S., Tayles, M.E. and Pike, R.H. (2004), "Intellectual capital: an evolutionary change in management accounting practices", Working Paper Series No. 04/29, Bradford University School of Management, Bradford.

Stewart, T. (1997), *Intellectual Capital: The New Wealth of Organizations*, Doubleday/Currency, New York, NY.

Sveiby, K.E. (1997), *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*, Berrett-Koehler, New York, NY.

Tomer, J.F. (2005), "Personal capital and emotional intelligence: an increasingly important intangible source of economic growth", *Eastern Economic Journal*, Vol. 3, pp. 453-70.

Trevinyo-Rodriguez, R.N. and Bontis, N. (2007), "The role of intellectual capital in Mexican family-based businesses: understanding their soul, brain and heart", *Journal of Information and Knowledge Management*, Vol. 6 No. 3, pp. 189-200.

Wang, W.Y. and Chang, C. (2005), "Intellectual capital and performance in causal models: evidence from the information technology industry in Taiwan", *Journal of Intellectual Capital*, Vol. 6 No. 2, pp. 222-36.

Westhuizen, C.V.D. (2005), "Intellectual capital management in a retail company in South Africa", unpublished dissertation, Department of Information and Knowledge Management, University of Johannesburg, Soweto.

Williams, L.J., Edwards, J.R. and Vandenberg, R.J. (2003), "Recent advances in causal modeling methods for organizational and management research", *Journal of Management*, Vol. 29 No. 6, pp. 903-36.

Xiaojun, X. (2004), "Managing intellectual capital transformation", working paper, School of Management, Fudan University, Shanghai.

Zambon, S. (2002), "Accounting, intangible and intellectual capital: an overview of the issues and some considerations", Working Paper 4, University of Ferrara, Ferrara.

Zucker, L.G., Darby, M.R. and Brewer, M.B. (1994), "Intellectual capital and the birth of US biotechnology enterprise", Working Paper Series 4653, NBER, Cambridge.

Further reading

Bontis, N. (2001), "CKO wanted – evangelical skills necessary: a review of the chief knowledge officer position", *Knowledge and Process Management*, Vol. 8 No. 1, pp. 29-38.

Bontis, N. and Serenko, A. (2009), "Longitudinal knowledge strategising in a long-term healthcare organisation", *International Journal of Technology Management*, Vol. 47 Nos 1-3, pp. 276-97.

Cleary, P., O'Regan, P., O'Donnell, D., Kennedy, T. and Bontis, N. (2007), "Positioning management accounting in the intellectual capital agenda", *International Journal of Accounting, Auditing and Performance Evaluation*, Vol. 4 Nos 4/5, pp. 336-59.

Kristandl, G. and Bontis, N. (2007), "The impact of voluntary disclosure on cost of equity capital and risk premium estimates in a temporal setting", *Journal of Intellectual Capital*, Vol. 8 No. 4, pp. 577-94.

Serenko, A. and Bontis, N. (2004), "Meta-review of knowledge management and intellectual capital literature: citation impact and research productivity rankings", *Knowledge and Process Management*, Vol. 11 No. 3, pp. 185-98.

Appendix 1

A – General Information

Intellectual Capital has often been described as the difference between what a firm's market value is and the cost of replacing its assets. Therefore, this (often-positive) difference can be described as "those things that we normally cannot put a price tag on" such as expertise, knowledge, and a firm's organizational learning ability.

There are three elements encompassing Intellectual Capital: 1) Human capital can be described as the firm's collective capability to extract the best solutions from the knowledge of its individuals, that which is in the minds of individuals; 2) Structural capital can be thought of as the firm's organizational capabilities to meet market requirements, what is left after employees go home for the night; 3) Relational (customer) capital refers to firm's relationships e.g. with the customers, suppliers and partners.

Business performance (productivity, profitability and market valuation). Just to remind you: Productivity means the relation between input and output of processes and transactions. Profitability means earnings before interest and tax (EBIT). Market valuation means the value of the whole organization or stock value.

B – Questionnaire Items

The following 90 items tap into Intellectual Capital and its effect on company's business performance. Please, answer these questions based on actual and current situation and not on beliefs.

[**1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree**] based on how you feel about the statement.

Human Capital

Learning and education:

1	The competence of company's employees as a whole is equal to the most ideal level (matching with their work requirements and responsibilities)	1	2	3	4	5
2	The company gets the most out of its employees when they cooperate with one another in team tasks.	1	2	3	4	5
3	Company's employees undergo continuous training programs every year.	1	2	3	4	5
4	Company's employees continuously learn from others (colleagues and outsiders).	1	2	3	4	5
5	The ratio of educated personnel is on average compared with industry (no. of PhD, Master and Bachelor degrees compared with what should be).	1	2	3	4	5
6	Company devotes a lot of time and effort to update and develops employees' knowledge and skills.	1	2	3	4	5
7	Company's market share has been continually improving over the past few years.	1	2	3	4	5
8	Employees' learning and education affect company's productivity.	1	2	3	4	5

(*Continued*)

Figure A1.

9	Employees' learning and education affect company's profitability.	1	2	3	4	5
10	Employees' learning and education affect company's market value (stock value).	1	2	3	4	5

Experience and expertise

11	Company's employees are experts in their respective areas.	1	2	3	4	5
12	Company's employees consistently perform at their best.	1	2	3	4	5
13	Company's employees generally give it their all, which makes this company different from others in the industry.	1	2	3	4	5
14	Company's employees have worked for many years in the firm (employee turnover is very low)	1	2	3	4	5
15	The company prides itself on being efficient.	1	2	3	4	5
16	The staff are highly professional.	1	2	3	4	5
17	The company has the lowest costs per transaction of any in the industry.	1	2	3	4	5
18	Employees' experience and expertise affect company's productivity.	1	2	3	4	5
19	Employees' experience and expertise affect company's profitability.	1	2	3	4	5
20	Employees' experience and expertise affect company's market value (stock value).	1	2	3	4	5

Innovation and creation

21	Company's employees are considered creative and bright compared with other companies in the industry.	1	2	3	4	5
22	Company's employees are keen to voice their opinions in group discussions.	1	2	3	4	5
23	Company's employees usually come up with new ideas.	1	2	3	4	5
24	Large numbers of new products are launched compared with competitors.	1	2	3	4	5
25	Company's employees are continuously encouraged to bring new knowledge and ideas to the business and share their knowledge with their colleagues.	1	2	3	4	5
26	Company's employees are satisfied with their company's innovation policies and programs.	1	2	3	4	5
27	Company's employees are highly motivated and committed to share new great ideas within the company, as it should be.	1	2	3	4	5
28	Employees' innovation and creation affect company's productivity.	1	2	3	4	5
29	Employees' innovation and creation affect company's profitability.	1	2	3	4	5
30	Employees' innovation and creation affect company's market value (stock value).	1	2	3	4	5

(*Continued*)

Figure A1.

Structural Capital

Systems and programs

31	The company has succession training programs for each and every post/position (major positions)	1	2	3	4	5
32	The company's culture and atmosphere are supportive and comfortable.	1	2	3	4	5
33	The company's recruitment programs are comprehensive; and dedicated to hiring the best candidates available.	1	2	3	4	5
34	The company has a well-developed reward system related to performance.	1	2	3	4	5
35	The company supports their employees by constantly upgrading their skills and education whenever it is necessary.	1	2	3	4	5
36	Staff have sufficient influence over decisions made within the company.	1	2	3	4	5
37	The company is not a "bureaucratic nightmare".	1	2	3	4	5
38	Company's systems and programs affect company's productivity.	1	2	3	4	5
39	Company's systems and programs affect company's profitability.	1	2	3	4	5
40	Company's systems and programs affect company's market value (stock value).	1	2	3	4	5

Research & Development (R&D)

41	The company is considered a research leader.	1	2	3	4	5
42	The company continuously develops work processes.	1	2	3	4	5
43	The company continuously develops and re-organizes itself based on R&D (e.g. structure and responsibilities).	1	2	3	4	5
44	The company follows up and adopts the latest scientific and technical development around the world.	1	2	3	4	5
45	The systems and procedures of the company support innovation.	1	2	3	4	5
46	The company determines appropriate and adequate budget for R&D.	1	2	3	4	5
47	The company's board of management highly trust and support the R&D department.	1	2	3	4	5
48	Company's R&D affects company's productivity.	1	2	3	4	5
49	Company's R&D affects company's profitability.	1	2	3	4	5
50	Company's R&D affects company's market value (stock value).	1	2	3	4	5

Intellectual Property Rights (IPRs)

51	The company sets clear strategies and procedures for IPRs management	1	2	3	4	5
52	The company monitors performance of the IPRs portfolio.	1	2	3	4	5
53	The company pursues a multiple strategy of licensing IPRs, spinning out new organizations or disposing of them to other parties.	1	2	3	4	5
54	The company actively encourages and rewards creation and extended use in order to maximize the income from IPRs.	1	2	3	4	5

(*Continued*)

Figure A1.

55	IP is a key intellectual asset for top management, which is considered for value creation.	1	2	3	4	5
56	The company utilizes the IPRs to maximum level.	1	2	3	4	5
57	The company has high number of IPRs per year compared with competitors.	1	2	3	4	5
58	Company's IPRs affect company's productivity.	1	2	3	4	5
59	Company's IPRs affect company's profitability.	1	2	3	4	5
60	Company's IPRs affect company's market value (stock value).	1	2	3	4	5

Relational Capital

Strategic alliances, licensing and agreements

61	The company is currently working on joint projects with many other organizations.	1	2	3	4	5
62	The company has diverse distribution channels.	1	2	3	4	5
63	High ratio of company's business is done with strategic alliances.	1	2	3	4	5
64	The company has many and diverse alliances (R&D, manufacturing, marketing, distribution)	1	2	3	4	5
65	People from outside the company are consulted when decisions are made within the company.	1	2	3	4	5
66	The company is able to learn and add value through its partners.	1	2	3	4	5
67	The company prides itself on being partnership-oriented.	1	2	3	4	5
68	Company's strategic alliances affect company's productivity.	1	2	3	4	5
69	Company's strategic alliances affect company's profitability.	1	2	3	4	5
70	Company's strategic alliances affect company's market value (stock value).	1	2	3	4	5

Customer and Supplier relations

71	A poll of company's customers shows them to be loyal to the company, and would indicate that they are generally satisfied.	1	2	3	4	5
72	When it comes to new business, the company's customers have increasingly selected company's products versus competitors' customers over the past few years.	1	2	3	4	5
73	The company capitalizes on customers' wants and needs by continually striving to make them satisfied.	1	2	3	4	5
74	The company devotes considerable time to select suppliers.	1	2	3	4	5
75	The company maintains a long-standing relationship with suppliers.	1	2	3	4	5
76	The company has greatly reduced the time it takes to resolve a customer's problem.	1	2	3	4	5
77	The company feels confident that their customers will continue to do business with it.	1	2	3	4	5
78	Company's relationship with customer and supplier affects company's productivity.	1	2	3	4	5

(*Continued*)

Figure A1.

79	Company's relationship with customer and supplier affects company's profitability.	1	2	3	4	5
80	Company's relationship with customer and supplier affects company's market value (stock value).	1	2	3	4	5

Customer Knowledge

81	It is important for the company to share knowledge with its partners.	1	2	3	4	5
82	The company gets as much feedback out of customers as it possibly can under different circumstances.	1	2	3	4	5
83	Customer knowledge is widely distributed throughout the company.	1	2	3	4	5
84	Data about customers are continuously updated.	1	2	3	4	5
85	The company has relatively complete data about the suppliers.	1	2	3	4	5
86	The company continually meets with customers to find out what they want from it.	1	2	3	4	5
87	The company has a useful and updated information system in use.	1	2	3	4	5
88	Company's knowledge about customers and suppliers affects company's productivity.	1	2	3	4	5
89	Company's data about customers and suppliers affects company's profitability.	1	2	3	4	5
90	Company's knowledge about customers and suppliers affects company's market value (stock value).	1	2	3	4	5

C – Questionnaire Items

The following 10 items are about the company's performance related to key competitors in the industry over the last few years and will be used for administrative and comparative purposes only. If you are not absolutely sure about an item, please just approximate. **[1 = bottom, 5 = top]** based on the number that best corresponds to your answer**.**

How do you rank your company compared to the competitors:

91	Industry leadership.	1	2	3	4	5
92	Future outlook.	1	2	3	4	5
93	Overall response to competition.	1	2	3	4	5
94	Success rate in new product launches.	1	2	3	4	5
95	Overall business performance and success.	1	2	3	4	5
96	Employee productivity.	1	2	3	4	5
97	Process (transaction) productivity.	1	2	3	4	5
98	Sales growth.	1	2	3	4	5
99	Profit growth.	1	2	3	4	5
100	Company's market valuation (stock value).	1	2	3	4	5

(*Continued*)

Figure A1.

Please complete this section of the survey:

Total No. of Employees:	
Total 2005 Revenue:	
Total 2006 Revenue:	
Your Position (Title):	
Company Name:	
Company Address:	
Telephone:	
Fax:	
E-mail:	
Web-site URL:	

E – Please note that the researcher left this space for any comments the respondent wishes to state.

Thank you for completing the questionnaire.

Figure A1.

Appendix 2

INTELLECTUAL CAPITAL QUESTIONNAIRE (ARABIC)

اسْتبَانة حَوْلَ رَأس المَال الفِكْريّ

1) معلومات عامة:

يُوْصفُ رَأس المَال الفِكْريّ عادة بالفرق بين القيمة السوقية للشَّركةِ وكلفةُ استبدال أصولها. لذا يُوصَفُ هذا الفرق بأنَّهُ: "تلك الأشياء التي لا نستطيعُ وَضْع قسيمة سعر عليها أو لها" مثل الخبرة والمعرفة وقدرة الشَّركة على التَّعلّم.

تُشيرُ كثيرٌ من الدّرَاسَاتِ إلى أنّ رَأس المَال الفِكْريّ يتكون من ثلاثة عناصر: 1) رَأسُ المَال البشري الذي يُمْكنُ انْ يُوْصَفَ بالقدرة الجَماعية للشَّركةِ لانتزاع أفضل الحلول منْ معرفةِ أفرادِها. 2) رَأسُ المَال الهيكلي يُمْكنُ أنْ يمثل قدرات الشَّركة لتلبية متطلباتِ السوق. 3) رَأسُ المَال العلاقاتي (الزبائني) يُشيرُ إلى علاقاتِ الشَّركة مع الآخرين، مثل العلاقات مَع الزَّبَائن والمُزَوِّدينَ والشُّرَكاء أو الحُلفاء.

أداء العمل يتكون من: الإنتاجية والربحية والقيمة السوقية. فقط للتذكير: الإنتاجية تعْني العلاقة بين المدخلات والمخرجات من العمليات والحركات. الربحيةُ تعْني الربح قبل الفائدة والضريبةِ (IBIT). القيمة السوقية (التقدير في البورصة) تعْني قيمة الشَّركة الكاملةِ أو قيمةِ الاسهم.

2) متغيرات رَأس المَال الفِكْريّ وعلاقَتها بالأداء: (الفقرات من 1 إلى 90).

(الرجاء التأكدْ من إجابة كُلّ سؤال ووضع دائرة حول الجواب الصحيحَ استِنادًا إلى مشاعرك وأحاسيسك حول الواقع الموجود وليس بناء على الاعتقاد أو الوضع المثالي لكل فقرة كالتالي: [1 = لا أوافقُ بقوة.....، 5 = أوافقُ بقوة])

رَأسُ المَال البشري

التعليم والتَّعلّم

1	انَّ جَدَارَةَ ومؤهلات المُوَظّفينَ في الشَّركة تصل إلى المستوى الذي تتطلبه مهماتهم.	5 4 3 2 1
2	إن الشَّركة تحصل على أفضل المخرجات من مُوَظّفيها عندما يَتعاونونَ مَعًا كفريق عمل.	5 4 3 2 1
3	تَنفذ الشركة برامج تدريبية مُسْتَمرّة لجميع المُوَظّفينَ فيها كل عام.	5 4 3 2 1
4	انَّ المُوَظّفينَ يَتعلّمُون من بعضهم ومنْ الآخرين باستمرار.	5 4 3 2 1
5	إن نسبة المُوَظّفينَ المتعلّمين في الشَّركة تتناسب والمعدل بالمقارنة مع الشَّركاتِ الأخرى في الصناعةِ نفسِها (الدكتوراه والماجستير والبكالوريوس).	5 4 3 2 1
6	إن الشَّركة تكرس كثيرا منْ الوقتِ والجُهد من أجل تطوير وتحديث معرفة ومهارة المُوَظّفينَ.	5 4 3 2 1
7	إن الحصة السوقيه للشَّركةِ تتحسّنُ بشكل مستمر خلال السّنوات القليلة الماضية.	5 4 3 2 1
8	انَّ تعليم وتَعلّم المُوَظّفينَ يُؤثّران على معدل إنتاجية الشَّركة.	5 4 3 2 1
9	إن تعليم وتَعلّم المُوَظّفينَ يُؤثّران على ربحيةِ الشَّركة.	5 4 3 2 1
10	إن تعليم وتَعلّم المُوَظّفينَ يُؤثّران على القيمة السوقية للشَّركة (قيمة الاسهم).	5 4 3 2 1

التجربة والخبرة:

11	إن المُوَظّفينَ يمتلكون خبرة عالية في مجال أعمالهم المطلوبة والمخصصة لهم.	5 4 3 2 1
12	إن المُوَظّفينَ يؤدون أعمالهم المطلوبة بأفضل ما يكون وبشكل ثابت.	5 4 3 2 1
13	إن المُوَظّفينَ بشكل عام يقدمون للشَّركةِ أفضل ما لديهم لجعلها مختلفة ومميزة عن المنافسين في الصناعة.	5 4 3 2 1
14	إن المُوَظّفينَ يَعْملون منذ العديد منْ السّنواتِ في الشَّركة (دوران عمالة قليل).	5 4 3 2 1

(*Continued*)

Figure A2.

15	إن الشّركة تُفتخرُ بكفاءتها.	5 4 3 2 1
16	إن المُوظّفين محترفونَ بشكل كبير.	5 4 3 2 1
17	إن الشّركة لديها أرخص تكلفة لكلّ حركة مقارنة مع الشّركات الأخرى في نفس الصناعة.	5 4 3 2 1
18	إن تجربة وخبرة المُوظّفينَ يُؤثّران على معدل إنتاجية الشّركة.	5 4 3 2 1
19	إن تجربة وخبرة المُوظّفينَ يُؤثّران على ربحيةِ الشّركة.	5 4 3 2 1
20	إن تجربة وخبرة المُوظّفينَ يُؤثّران على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

إبداع المُوظّفين وتوليد الأفكار:

21	إن المُوظّفين يُعتَبرُونَ مُبدعين ولامعين مقارنة مع الشركات الأخرى في نفس الصناعة.	5 4 3 2 1
22	إن المُوظّفين يتحمسون لطرح وإبداء ارائهم في المُناقشاتِ الجماعيةِ والاجتماعات.	5 4 3 2 1
23	إن المُوظّفينَ عادة يبتكرون أفكارا جديدة.	5 4 3 2 1
24	إن عدد المنتجات الجديدةِ والمطورة التي تقدم إلى السوق أكثر من التي يقدمها المنافسون.	5 4 3 2 1
25	إن الشّركة تستمر بتشجيع المُوظّفينَ على اكتساب المعرفةِ والأفكار الجديدة ومُشاركة الزملاء فيها لاستخدامها بالعمل.	5 4 3 2 1
26	إن المُوظّفين راضون عن سياسة وبرامج الإبداع وتوليد الأفكار في الشّركة.	5 4 3 2 1
27	إن المُوظّفين مُحفزون وملتزمون بالمشاركة بالأفكار الجديدة داخل الشركة كما ينبغي.	5 4 3 2 1
28	انّ إبداع المُوظّفينَ وتوليد الأفكار يُؤثّران على معدل إنتاجية الشّركة.	5 4 3 2 1
29	إن إبداع المُوظّفينَ وتوليد الأفكار يُؤثّران على ربحيةِ الشّركة	5 4 3 2 1
30	إن إبداع المُوظّفينَ وتوليد الأفكار يُؤثّران على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

رأسُ المال الهيكلي

الأنظمة والبرامج:

31	إن لدى الشّركة برامج تدريب لتهيئة البديل المناسب لكلّ موقع (المواقع المهمة)	5 4 3 2 1
32	إن ثقافة وظروف عمل الشّركة مساعدة ومريحة.	5 4 3 2 1
33	إن برامج التوظيف شاملة؛ بحيث تكرّسُ الشّركة الجهد العالي لتوظيف أفضل المرشّحين المتوفرين.	5 4 3 2 1
34	إن لدى الشّركة نظام حوافز وجوائز متطورًا جدا ويركز على الأداء.	5 4 3 2 1
35	إن الشّركة تُدعمُ المُوظّفين بشكل ثابت ودائم لتوسيع وتطوير مهاراتهم وتعليمهم عند الضرورة.	5 4 3 2 1
36	إن المُوظّفينَ لهم تأثيرٌ كافٍ على القرارات التي تقرر ضمن الشّركة.	5 4 3 2 1
37	إن هذه الشّركة ليستْ "كابوسا بيروقراطيا".	5 4 3 2 1
38	إن أنظمة وبرامج الشّركة تُؤثّرُ على معدل إنتاجية الشّركة.	5 4 3 2 1
39	إن أنظمة وبرامج الشّركة تُؤثّرُ على ربحيةِ الشّركة.	5 4 3 2 1
40	أنّ أنظمة وبرامج الشّركة تُؤثّرُ على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

البَحْث والتطوير العلمي:

41	إن الشّركة رائدة في البَحْث العلمي.	5 4 3 2 1
42	إن الشّركة تُطوّرُ العمليات بشكل مستمر.	5 4 3 2 1
43	إن الشّركة تتطوّرُ وتعيد تنظيم نفسها بشكل مستمربما يتناسب مع البحث والتطوير العلمي (مثل: تطوير الهيكل والمسؤوليات).	5 4 3 2 1
44	إن الشركة تتابع وتتبنى أخر التطورات العلمية والتقنية حول العالم.	5 4 3 2 1
45	إن الانظمة والإجراءات في الشّركة تُدعمُ الإبداع.	5 4 3 2 1
46	إن الشركة تخصص وترصد ميزانية كافية ومناسبة للبحث العلمي.	5 4 3 2 1
47	إن قيادة الشّركة (مجلس الإدارة) يثقون ويدعمون البحث والتطوير العلمي إلى حدٍ كبير.	5 4 3 2 1
48	إن البَحْث والتطوير العلمي يُؤثّران على معدل إنتاجية الشّركة.	5 4 3 2 1
49	إن البَحْث والتطوير العلمي يُؤثّران على ربحيةِ الشّركة.	5 4 3 2 1
50	إن البَحْث والتطوير العلمي يُؤثّران على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

حُقُوقَ المُلكيّة الفِكريّة:

51	إن الشّركة تضعُ استراتيجيات وإجراءات واضحة لإدارة حُقُوق المُلكيّة.	5 4 3 2 1
52	إن الشّركة تراقب عن كثب أداء حقيبة (ملفات) حُقُوق المُلكيّة.	5 4 3 2 1
53	إن الشّركة تتبع إستراتيجيات متعدّدة منْ اجل منح أو الحصول على تراخيص حُقُوق المُلكيّة (سواء أخذا أم عطاء من أو إلى أطراف أخرى).	5 4 3 2 1
54	إن الشّركة تشجّعُ بنشاط وتكافئ توليد الأفكار وتوسيع استعمالها لكي تعظم الدخلَ من حُقُوق المُلكيّة.	5 4 3 2 1
55	إن الشّركة تعتبر حُقُوقَ المُلكيّة هي الثروة الرئيسية لرأس المال الفِكريّ وتعمل الإدارة على تعظيم قيمتها ضمن توجيهات الشركة بشكل عامّ.	5 4 3 2 1
56	إن الشركة تستخدم وتستفيد من حُقُوقَ المُلكيّةِ الفِكريّةِ إلى أقصى حد ممكن.	5 4 3 2 1

(*Continued*)

Figure A2.

57	إن الشركة تطور وتسجل عددا كبيرا من حُقُوقَ المُلكيّةِ الفكريّةِ كل سنة مقارنة بالمنافسين.	5 4 3 2 1
58	إن حُقُوقَ المُلكيّةِ الفكريّةِ تُؤثّرُ على معدل إنتاجية الشّركة.	5 4 3 2 1
59	إن حُقُوقَ المُلكيّةِ الفكريّةِ تُؤثّرُ على ربحيةِ الشّركة.	5 4 3 2 1
60	إن حُقُوقَ المُلكيّةِ الفكريّةِ تُؤثّرُ على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

رأسُ المال العلاقاتي (الزبائني)

التحالفات الإستراتيجية والتراخيص والإتفاقيات:

61	إن الشّركة تعملُ حالياً على المشاريع المشتركة مع العديد منْ المؤسّسات.	5 4 3 2 1
62	إن لدى الشّركة قنوات توزيع متنوّعة.	5 4 3 2 1
63	إن نسبة عالية منْ أعمال الشّركة تعمل بالتحالفات الإستراتيجية مع المؤسسات الأخرى.	5 4 3 2 1
64	لدى الشّركة الكثيرُ من التحالفات المتنوّعة (في البَحْث والتطوير العلمي، التصنيع، التسويق والتوزيع).	5 4 3 2 1
65	انه يتم استشارة خبراء وأشخاص من خارج الشّركة عند إتخاذ القرارات الاستراتيجية لتُصبحُ قيد التنفيذ.	5 4 3 2 1
66	إن الشّركة قادرة على التعلّم وإضافة قيمة لها من خلال التحالفات.	5 4 3 2 1
67	إن الشّركة تَفْخرُ بنفسها على أنها تتبنى سياسة التحالفات.	5 4 3 2 1
68	إن التحالفات الإستراتيجية والتراخيص والاتفاقيات تُؤثّرُ على معدل إنتاجية الشّركة.	5 4 3 2 1
69	إن التحالفات الإستراتيجية والتراخيص والاتفاقيات تُؤثّرُ على ربحية الشّركة.	5 4 3 2 1
70	إن التحالفات الإستراتيجية والتراخيص والاتفاقيات تُؤثّرُ على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

العلاقات مع المُزوّدينَ والزبائنَ:

71	إن معظم الزّبائن موالون للشّركة وراضون عنها بصفة عامة.	5 4 3 2 1
72	إن الزبائن يختارون المنتجات الجديدة للشّركة بشكل متزايد مقارنة مع زبائن المنافسين خلال السّنوات القليلة الماضية.	5 4 3 2 1
73	إن الشّركة تركز على وتستفيدُ منْ رغبات وحاجات زبائنها عن طريق بذل جهود مُستَمرّة لإرضائهم.	5 4 3 2 1
74	إن الشّركة تكرّسُ وقتا كبيرا لاختيار المُزوّدين.	5 4 3 2 1
75	إن الشّركة تحافظ على علاقات طويلة المدى مع المُزوّدين.	5 4 3 2 1
76	إن الشّركة قد خفضت إلى حد كبير الوقت اللازم لحل مشاكل الزّبائن.	5 4 3 2 1
77	إن المُوَظّفينَ يشْعرونَ بالثقة بأنّ الزبائن سيواصلون التعامل مع الشّركة.	5 4 3 2 1
78	إن العلاقات مع المُزوّدينَ والزبائنَ تُؤثّرُ على معدل إنتاجية الشّركة.	5 4 3 2 1
79	إن العلاقات مع المُزوّدينَ والزبائنَ تُؤثّرُ على ربحية الشّركة.	5 4 3 2 1
80	إن العلاقات مع المُزوّدينَ والزبائنَ تُؤثّرُ على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

المعرفة والمعلومات عن الزّبائن والمُزوّدينَ:

81	إن الشّركة تهتم بمشاركة حلفائها بالمعرفة والمعلومات.	5 4 3 2 1
82	إن الشّركة تسعى للحصول على أكبر قدر ممكن من التعليقات والتغذية الراجعة من الزّبائن والحلفاء وفي كل الظروف.	5 4 3 2 1
83	إن الشّركة تُعممُ المعرفة والمعلومات حول الزبائن على نحو واسع.	5 4 3 2 1
84	إن البيانات حول الزّبائن تُجدّدُ بشكل مستمر.	5 4 3 2 1
85	إن لدى الشّركة بيانات كاملةُ نسبياً حول المُزوّدين.	5 4 3 2 1
86	إن المُوَظّفينَ يَجتمعونَ بالزّبائن بشكل مستمر لإكتشاف الرغبات والحاجيات التي يريدونها.	5 4 3 2 1
87	إن نظامَ المعلوماتِ المستخدم مفيد ومُحدث.	5 4 3 2 1
88	إن المعرفة والمعلومات عن الزّبائن والمُزوّدينَ تُؤثّرُ على معدل إنتاجية الشّركة.	5 4 3 2 1
89	إن المعرفة والمعلومات عن الزّبائن والمُزوّدينَ تُؤثّرُ على ربحية الشّركة.	5 4 3 2 1
90	إن المعرفة والمعلومات عن الزّبائن والمُزوّدينَ تُؤثّرُ على القيمة السوقية للشّركة (قيمة الاسهم).	5 4 3 2 1

3) متغيرات الأداء في ضوء أداء المنافسين في الصناعة خلال السّنوات القليلة الماضية: (الفقرات من 91 إلى 100). الرجاء إكمالُ هذا القسم من المسح الذي سَيستخدم للأغراض الإداريةِ والمقارنات فقط. وإذا لم تكن متأكدا من الإجابة الرجاء وضع تقدير تقريبي.

كيف تقيم شركتك مقارنة بالشّركات المنافسه بالنسبة للفقرات التالية:

91	القيادة في الصناعة.	5 4 3 2 1
92	التطلعات المستقبلية.	5 4 3 2 1
93	الرّدَ بشكل عامّ على المنافسة.	5 4 3 2 1
94	نسبة النجاح في تسويق المنتجات الجديدة.	5 4 3 2 1
95	أداء ونجاح أعمال الشّركة بشكل عامّ.	5 4 3 2 1
96	معدل إنتاج الموظف.	5 4 3 2 1
97	معدل إنتاجية العملية (الحركة).	5 4 3 2 1

(*Continued*)

Figure A2.

98	نمو الأرباح.	5 4 3 2 1
99	نمو المبيعات.	5 4 3 2 1
100	القيمة السوقية لِلشّركةِ (قيمة الاسهم).	5 4 3 2 1

4) الرجاء إكمالْ هذا القسم الذي سوف يستخدم لأغراض التحليل الإداري فقط.

مجموع المُوَظّفين:
اجمالي دخل الشّركة 2005:
اجمالي دخل الشّركة 2006:
الموقع أو المسمى الوظيفي:
اسم الشّركة أو المؤسسة:
عنوان الشّركة أو المؤسسة:
الهاتف:
الفاكس:
البريد الإلكتروني:
موقع الويب (Web-site):

5) **الرجاء كتابة التعليقات والملاحظات** حول مشروع البَحْث والاستبْانة بشكل عام والأسئلة والفقرات بشكل خاص ولك جزيل الشكر. (يمكن أن تستخدم أوراق إضافية للملاحظات والتعليقات)

شكراً لإكمال الاستبْانة.
عبدالعزيز أحمد الشرباتي.

Figure A2.

Corresponding author
Abdel-Aziz Ahmad Sharabati can be contacted at: apharmaart@cyberia.jo