

Almutirat, Hanan Ali

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The impact of intellectual capital in organizational innovation: case study at Kuwait Petroleum Corporation (KPC)

Hanan Ali Almutirat

Department of Engineering Design, Kuwait Ministry of Defense, Kuwait, Kuwait

Abstract

Purpose – The purpose of this paper is to study the relationship between intellectual capital and organizational innovation in Kuwait Petroleum Corporation (KPC) through a case study at KPC on the employees of the corporation (The study population was 2,180 respondents and the sample size was 335 respondents).

Design/methodology/approach – The statistical package for social science was used to analyze the data. While trying to explore the relationship between intellectual capital and innovation, the researcher used the descriptive analytical method and the case study methodology using various references, periodicals, internal and external documents and data, in addition to conducting a field study on a sample of employees of KPC, through a questionnaire form containing the axes that reflect the study variables.

Findings – There is a relative approval between the sample of the research on the existence of a good role for training in the corporation in terms of availability for all employees and the compatibility of training programs with the actual needs of employees, and linking the training paths and career paths for promotions in the corporation. The researcher attributed this to the employees' awareness to the importance of training and its role in raising their performance levels, and the awareness of the corporation to the importance of training and capacity building of the human element.

Originality/value – The research, in general, demonstrated the importance of human capital as the organization's most valuable assets, especially as it supports creativity and innovation, thus enabling competitiveness. The research stressed that human capital is the most important element in the formation of intellectual capital, which requires decision-makers to support it and give the intellectual and human aspects a strategic content that meets the needs to develop innovation and institutional education and to recruit systems and indicators to measure the performance objectively to achieve the goal of survival of the corporation in a competitive sustainable environment, through providing material and moral potentials that can support the implementation of organizational innovation at various levels.

Keywords Intellectual capital, Human capital, Structural capital, Human resources, Kuwait, Organizational innovation, Empowerment, Client capital, KPC, Innovation

Paper type Case study



Introduction

Modern organizations are keen to build intellectual capital to support their competitiveness, deepen their positive mental image through capacity building, training and empowerment

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and provide an organizational climate that supports creativity and innovation among employees.

The organization's work environment is constantly changing, putting the management in a constant challenge to adapt to the latest developments in this environment. This can only be achieved if the organization has qualified human resources and provides a culture of creativity and innovation.

In the past few decades, competition has increased between companies and institutions operating in the oil industry in the world due to globalization, trade liberalization and technological progress. This highlighted the importance of the creative aspects, which usually originate from the human resources. Therefore, intellectual capital is one of the key tools in developing the business environment and creating a competitive advantage. Also, organizational innovation is considered one of the most important prerequisites of modern management, especially for organizations that seek excellence where organizational innovation is a distinctive feature in its individual, functional and organizational levels.

In spite of KPC's efforts in the field of financial investments and intellectual knowledge, to develop the organizational innovation of its employees, to achieve its strategic objectives, it is still unclear whether these efforts are compatible with the broad concept of intellectual capital development or not, especially with the lack of awareness of the importance of intellectual capital in the development of organizational innovation skills.

The study worked on a problematic study of how to build intellectual capital and support a course in achieving organizational creativity in public organizations in general and in the KPC in particular.

The main objective of the research was to highlight the importance of the role that intellectual capital in its three components (human capital - structural capital - client capital) plays in supporting organizational innovation, especially in KPC, which is an addition to the research studies and studies carried out in this context.

The practical importance lies in the applied studies on KPC to determine the possibility of applying the intellectual capital input on the development of organizational innovation in KPC, and the extent of its effects on the production and investment operations and the competitive situation and the sustainability of its role in serving the oil sector.

The research was applied to all employees of KPC. The applied study was carried out during the period from first of January 2018 until the end of March 2018.

This paper is divided into four sections. The first section presents the literature review, the second presents the methodology, the third discusses the research findings and finally, the fourth highlights the research conclusions and study limitations.

First: Literature review

Many studies, most importantly is [Pilevari et al. \(2015\)](#) have shown the impact of investment in human capital over innovation in oil-rich countries, particularly Iran, that such investment does not necessarily lead to innovation or wealth increase. [Rosdi \(2014\)](#) examined the theoretical framework of the concept of human resource management as a basis for developing organizational innovative capacities and identifying the intermediate factors between human resource management and the innovation process on one hand and between innovation and knowledge management on the other. [Lerro et al. \(2014\)](#) study to identify the relationship of human capital and innovative performance as a basis for the development of more effective creative strategies (included 554 Serbian managers in 7 industrial sectors) stated that the biggest gaps are related to innovation stimuli, which are: education, knowledge sharing and social skills. [Sheehan et al. \(2014\)](#) study on creativity and human resources development stated that the relationship between them did not have a

significant effect, which requires further research and linking it to the organizational culture, surrounding environment and leadership capabilities. [Glor \(2014\)](#) study demonstrated the impact of innovation process on achieving organizational objectives, employee objectives, organizational performance and organizational structure and emphasized on the importance of performing a case study to measure that impact. [Wu and Sivalogathan \(2014\)](#) study concluded that there is an impact from intellectual capital, especially human capital, on stimulating the creative capacities of the organization. [Lerro et al. \(2014\)](#) provided an intellectual framework to summarize the basic assumptions for a better understanding of the importance of intellectual capital as a catalyst for competitive capabilities. [Santos-Rodrigues et al. \(2013\)](#) study examined the impact of intellectual capital on creative capacity in European governmental health organizations, showing a direct relationship between the incentive for innovation (a part of human capital) and the creative output. [Wu and Sivalogathan \(2013\)](#) examined the impact of organizational motivation and organizational characteristics as intermediate agents for intellectual capital on creative capabilities, through a field study on a group of managers and executives in Sri Lanka's garment industry, emphasizing the importance of developing intellectual capital and human capital as a key component to create innovation in this sector. [Jung \(2011\)](#) studied a number of industrial companies in the USA on how their intellectual capital affects the innovation in their projects and has shown the impact of intellectual capital on the human capital as a major component, on innovation. [Jamal \(2011\)](#) addressed the impact of human capital management on organizational performance in 16 industrial enterprises in Pakistan and showed a strong positive impact on organizational performance and emphasized on the importance of investment in human capital to achieve competitive advantages at the sectoral and national levels. In addition, [Al Rehman et al. \(2011\)](#) showed the impact of intellectual capital in 12 companies in Moradabad, Pakistan, on the performance level and stated that there was a significant impact from intellectual capital on performance and recommended the importance of investment in human resources to increase staff efficiency and the positive feedback from this investment.

[Santos-Rodrigues et al. \(2010\)](#) highlighted the impact of human capital on the creative capacities of 68 industrial enterprises in northern Spain and Portugal and showed that the different dimensions of human capital (which are knowledge creation, motivation and creative behavior) directly affect the dimensions related to the process of creativity. ([Heffner, 2006](#)) examined the process of technological innovation and the transformation of knowledge management from tacit knowledge to explicit knowledge and intellectual capital.

In view of the previous studies, there is a consensus on the importance and role of intellectual capital in enhancing organizational competitiveness. Nevertheless, there is scarcity of research related to the Kuwaiti administrative system. It is important to recognize that Kuwait raises the attention to human capital in the government sector, which plays an important role in national development, as it employs 93% of the citizens and the annual budget of the government reaches about 100 bn US dollars.

Hence, this study focuses on identifying the role of intellectual capital in achieving organizational innovation in KPC.

Second: Theoretical framework and methodology

Part 1: Intellectual capital. The emergence of the intellectual capital concept dates back to the early 1990s ([Yusuf, 2005](#)). The researchers agreed that what characterizes successful organizations the most is the ability to optimize the use of intellectual capital. Intellectual capital is defined as the most important intangible assets whose results are shown as economic and material values that have a competitive advantage ([Carmeli and Tishler,](#)

2004). It is also defined as intensive knowledge-based relationships that have the potential to generate value and development (Edvinsson and Malone, 2017). The difficulty of agreeing on a definition for the concept of intellectual capital is that it is intangible (Choong, 2008), and it overlaps with many branches of knowledge such as psychology, accounting, sociology, business administration, public administration, etc. (Mustafa, 2004).

The diversity of areas of interest of researchers in their study of intellectual capital, there are those who dealt with intellectual capital as a management of knowledge and an added value for the organization, and therefore focused on intangible intellectual assets, which determine the market value of the organization, and there are those who care about intellectual capital in terms of its components and ways and means of measuring it and how to use it and maximize its value, and there are those who are interested in assessing the impact of intellectual capital on the performance of business organizations.

Intellectual capital usually used in tandem with both intellectual property and intellectual knowledge assets, and it can be seen as a total stock of capital or knowledge-based rights that the organization has, and represents the final product of the transfer process knowledge of intellectual assets of economic value to the organization. It also goes beyond the narrow concept of human capital to include other aspects, some of which relate to organizational systems and procedures, while others relate to the reputation of the organization and the balance it possesses among its clients

The researcher believes that intellectual capital is all the intangible assets of the organization, which adds value to it and enhance its competitive position, namely, workers and their mental abilities, knowledge, skills and experiences that enable them to create and produce new ideas, processes and systems within the organization, leadership style, organizational climate and organizational culture, as well as all forms of intellectual property owned by the organization, within the framework of the organization's intellectual image of its customers and its good reputation within the business community and the strength of its brand in society.

From the previous definition, it can be inferred that the main elements of intellectual capital are: human capital; the human resources of the organization and their knowledge and experience and their desire to learn and develop; structural capital, which is linked to the organization's physical infrastructure such as buildings and computers and the intangible such as the organization's history, culture and management and is reflected on the organization's subsystems. Social capital; is the network of the organization's relations with the community and its interest in the beneficiaries of its services and products.

Intellectual capital can be measured through several elements, including (Sullivan, 2017):

- Intellectual property: it is measured by counting the number of patents, intellectual property rights, copyrights, trademarks, trade secrets, licenses and the assets of the organization protected by law.
- Organization operations: refers to the utilization of the organization's resources and is measured through the efficiency, effectiveness and productivity index of the organization.
- Organizational culture: it is measured by assessing the basic values, principles, beliefs and attitudes of individuals and groups working in the organization.
- Research and development activities: these are measured through research and development operations, future policies, programs and operational plans, and future outlook activities in the long run, as this leads to achieving a higher level of performance for the organization and helps to improve the exploitation of competitive advantages.

- Creativity and innovation: it is the organization's success in implementing new ideas, and it is measured by counting the number of adjustments to existing or new products or services.
- Technology: it includes identifying machines, information technology systems such as computers and software, databases and methods of modern technologies (Roos and Dragonetti, 2015) it is measured through the standard comparison with the technology available in this field.
- Financial relationships: it is measured through the rates of return on investment, rates of liquidity and financial efficiency and measuring the relationship of the organization with investors, banks and other financiers and includes measuring the size of available financial facilities.
- Quality of management practices: measured by the number and quality of licenses and certificates granted to the organization such as international quality certificates and ISO and licenses obtained by the organization.
- Networks: measured by the quality of the networks and systems available within the organization that allow interaction between workers, through internal means of communication, for example, e-mail, internal networks and newsletters.

Part 2: Organizational innovation. Whereas the concept of organizational innovation, indicates the intention to adapt to new ideas or methods and its accreditation in the organization, which is the main means of changing the organization to be more responsive to changes in the internal and the external environment (Katz, 2014). It is also known as the first use of a new idea at the managerial or productive level, so if it was later on used in other organizations, it is considered "organizational innovation" (Nling and Naseeruddin, 2010). It is also seen as a set of activities that the organization undertakes such as: attracting, sustaining and developing the creative individuals it needs at present and in the future to achieve the present and future objectives and the competitive advantage of the organization.

The need for organizational innovation (Christensen, 2017) arises when decision-makers in the organization realize that there is a discrepancy between the organization's actual and desired performance. This disparity urges the management of the organization to consider adopting a new approach.

There are various factors influencing organizational innovation as follows (Stewart, 2015):

- *First:* to empower the organization's staff by delegating more authorities to ensure an atmosphere of cultural cooperation.
- *Second:* the interest in the employees' proposals, not to be ignored by managers because of its positive effects on their motivation and bearing responsibility.
- *Third:* the interest of the organization's departments in technical innovation as a key tool in providing new products and improving existing ones, as well as designing new processes and improving existing ones, so as to be able to adapt to the technical development outputs and the intense market competitive conditions.
- *Fourth:* to increase the managers and employees awareness of the relationship and influence between types of technical innovation and competitive advantages.
- *Fifth:* to exchange experiences and expertise in the production and dissemination of knowledge, through searching for the latest developments and applications and how to use them to achieve the required progress.

- *Sixth*: to take care of customer complaints by collecting and studying such complaints and providing appropriate solutions.

Therefore, this research agrees with the past studies that were mentioned previously that there is a direct relationship between intellectual capital and organizational innovation.

Obstacles to applying organizational innovation in public organizations

The process of applying organizational innovation faces many constraints and limitations that reduce the organization's ability to modernize and develop its operations, and the ability of human capital to invest its capabilities, develop itself and deliver new among these obstacles:

- Fear of change and acceptance of the status quo over renewal and change (Raynor, 2016).
- Managers are busy with daily chores, rejecting new ideas and considering them a waste of time.
- Adherence to strict laws and regulations (Nathan, 2016) and strict emphasis on formalities without substance.
- Centralization of management and non-delegating works to workers.
- Presence of presidential breaks (Gregersen, 2017) or lack of ease of communication and communication between workers and officials in senior management, until employees communicate their ideas and proposals to officials easily and discuss them with them, which is in the interest of the organization.

Part 3: the impact of intellectual Capital on organizational innovation

- Leadership patterns affect the formation of the intellectual capital of the organization and support organizational creativity in one way or another. Leadership with participation affects the participation of workers in decision-making and exchange of views, which leads to a common understanding of problems and a collective commitment to decisions or solutions. It also authorizes them to make whatever decisions they see supportive to achieve the goals. It also contributes in raising the level of job performance and getting the job done well by paying attention to the participation, needs and respect of others.
- The organizational climate affects organizational creativity, by providing job satisfaction for employees, and the importance of the organizational climate increases as a necessary element to achieve the necessary convergence between the goals of the organization and the goals of its employees, as well as it leads to contributing to the development of intellectual capital through working to develop different dimensions within this Organization, improving and developing the administrative process, and for the organizational climate to lead to the formation of positive creative practices for individuals that are consistent with expectations, there must be a match between the skills and ability of individuals on one hand and their job requirements on the other hand.
- Training and capacity building for human resources is one of the ruling elements in achieving organizational creativity. The training process is an effective way to increase the efficiency of individuals within any institution, and training often leads to increased acquisition of new skills and experiences and stimulates the spirit of

competition between individuals and workers to receive more new information and develop their performance

- Empowerment contributes in building intellectual capital and achieving organizational creativity, by giving individuals greater authority in doing business and taking responsibility and using their capabilities to set goals for their work, make decisions and solve problems within the scope of their responsibilities and powers and launches their creative ideas to subjectively solve problems.
- The quality of work life contributes to improving and developing the creative climate for workers by creating a positive atmosphere for launching innovative ideas for workers and the support of the management for them.

Methodology

The KPC is a public corporation of an economic nature supervised by the Minister of Oil, has an independent budget that is managed on a commercial basis, and is wholly owned by the State. The KPC is an umbrella organization of all Kuwaiti oil companies. Its activities are based on exploration, production, refining, marketing, transportation and petrochemicals industry.

The researcher chose KPC as a case study because of its importance on the economic, social and political levels of the State of Kuwait. The researcher contends that supporting organizational innovation through developing the intellectual capital of the corporation will benefit KPC and the Kuwaiti society as a whole.

While trying to explore the relationship between intellectual capital and innovation, the researcher used the descriptive analytical method and the case study methodology using various references, periodicals, internal and external documents and data, in addition to conducting a field study on a sample of employees of KPC, through a questionnaire form containing the axes that reflect the study variables.

The main hypothesis of the research was that

H01. "There is a strong positive effect of statistical significance at a significant level (0.05α) between intellectual capital and organizational innovation in KPC."

Therefore, the following sub-assumptions have emerged:

H01.1. "There is a strong positive effect of statistical significance at a significant level ($\leq 0.05 \alpha$) between human capital and organizational innovation at KPC."

H01.2. "There is a strong positive effect of statistical significance at a significant level ($\leq 0.05 \alpha$) between structural capital and organizational innovation at KPC."

H01.3. "There is a strong positive effect of statistical significance at a significant level ($\leq 0.05 \alpha$) between the client capital and organizational innovation at KPC."

Research population

The research Population represents all employees in KPC with 2,180 individuals.

Sample size

Statistical tables were used which considers the sample representation of the population and the required degree of accuracy, at 95% confidence intervals and $\pm 5\%$ error limits and 50% availability of community characteristics. As the size of the research population lies between the size of the population of 2,000 and 3,000 individuals in the statistical tables, and the size of the corresponding sample of these 2 categories is 322 and 341 individuals respectively, then the size of the sample of this research is 335 individuals. The random sample was used to apply the questionnaire to them.

Limits of research

The research was applied to all employees of KPC. The applied study was carried out during the period from first of January 2018 until the end of March 2018.

Demographic and professional characteristics of respondents

Empirical results indicate that the sample consists of 58.1% men and 41.9% women, according to the years of practical experience at KPC 71% is 10 years and more, 18.1% for respondents with 5 to less than 10 years and 10.9% for less than 5 years. According to the educational level 69% Bachelor's degree holders and above compared to 31% for specialized and secondary diplomas, which achieves the objectives of the study. According to the functional level: 20.3% leadership positions, 30.6% supervisory level and 49.1% executive level. This is particularly useful in determining the availability of human capital components.

Methods of statistical analysis

The study relied on the use of the statistical package for social science version 22.1. Statistical descriptive methods such as frequency distribution, percentages, arithmetic mean, standard deviation, multiple regression analysis and *t*-Test for independent samples were used.

Data collection tool

A questionnaire was designed that included five sets of questions:

- The first group dealt with the personal and career data of the research sample (gender/scientific level/career level/years of experience), represented by the terms one to four.
- The second group dealt with the availability of human capital components in KPC's working environment, represented by the terms 5 to 22.
- The third group dealt with the availability of structural capital components in KPC's working environment, represented by the terms 23 to 33.
- The fourth group dealt with the availability of the client capital in KPC's working environment, represented by terms 34 to 42.
- The fifth group dealt with the role of intellectual capital with its components in practicing organizational innovation in KPC's working environment, represented by the terms 43 to 50.

To ascertain the validity and consistency of the questionnaire (validity of the arbitrators/apparent consistency), the researcher presented the questionnaire to a group of arbitrators from the specialists in public administration and applied statistics. The researcher verified

the consistency of the questionnaire, by calculating the alpha coefficient Cronbach. The results are shown in [Table A1](#).

Third: Research findings

The researcher relied on the analysis of qualitative indicators aimed at determining the results of the study according to three axes:

The first axis: Determining the availability of intellectual capital in Kuwait petroleum corporation

The availability of Human Capital, [Table A2](#) shows the frequency of responses to the availability of human capital building components in the KPC work environment and [Table A3](#) shows the arithmetic mean, standard deviation and probability value (sig.) for the responses to the availability of human capital building elements in the KPC work environment.

It is clear from the analysis of Tables A2 and A3 that There is a relative approval in the sample of the research on the existence of a good role for training in the corporation in terms of availability for all employees, and the compatibility of training programs with the actual needs of employees, as well as linking the training paths and career paths for promotions in the corporation. The researcher attributed this to the employees' awareness to the importance of training and its role in raising their performance levels, as well as the awareness of the corporation to the importance of training and capacity building of the human element:

- The number 11 statement on the availability of sufficient powers to perform the tasks required from them is less to with an average of 3.11 (the total score of 5), a relative average of 63.01, a test value of 7.11 and a probability value (sig.) of 0.000. Therefore this is statistically significant at the level of significance of $\alpha = 0.05$ which indicates that the average response to this paragraph has exceeded the mean score of 3, which means that there is weak approval by the sample individuals on this statement, which indicates the lack of delegation of the workers and their inability to participate effectively with the administration.

The availability of structural capital, [Table A4](#) shows the frequency of responses to the availability of structural capital building elements in the KPC work environment and [Table A5](#) shows arithmetic mean, standard deviation and probability value (sig.) responses to the availability of structural capital building components in the KPC work environment.

It is clear from the analysis of Tables A4 and A5 the results indicated that the procedures and methods of work prevailing in the organization are simple with few constraints to the proper functioning of the work, where 30% indicate the lack of simplicity of procedures compared to 59% see the contrary The responses about work procedures ranked first in terms of agreement with an average of 3.78 (the total score of 5), a relative average of 77.54, the test value of 19.83 and probability value (sig.) is 0.000:

- The results indicated the lowest response levels in the section about the institution providing an annual budget for research and development, it ranked last order in terms of agreement with an average of 3.42 (total score of 5), a relative average of 69.36, a test value of 12.77 and probability value (sig.) is 0.000. Therefore this statement is statistically significant at significant level $\alpha = 0.05$, indicating that the average response rate for this paragraph has exceeded the mean score 3. This

means that the respondents agreed on this paragraph that there is no annual budget for research and development.

- The results also indicated the availability of an information system in KPC that gives the information in a precise and timely manner with 81% indicating strong agreement on the existence of an information system that provides data for each department in the right time and accuracy. The responses showed an average of 3.71 (total score of 5), a relative mean of 73.01, a test value of 19.11 and probability value (sig.) is 0.000. Therefore this is statistically significant at significant level $\alpha = 0.05$ indicating that the average response rate is higher than the mean score 3. This means that the sample respondents agreed on this particular paragraph that there is an information system in the Corporation that gives the information in a precise and timely manner.
- In general, the arithmetic mean of all statements is 3.63, the relative arithmetic mean is 70.64, the test value is 13.03 and the probability value (sig) is 0.000. Therefore, this group is statistically significant at significant level $\alpha = 0.05$ indicating that the average response to this field is essentially different from the mean score 3, which means that there is agreement by the sample on the paragraphs of this field, which means the realization of the sample of the study of the availability of structural capital components in the KPC.

The availability of Client's Capital in KPC work environment, [Table A6](#) shows the frequency of responses to the availability of capital building components in the work environment of KPC and [Table A7](#) shows arithmetic mean, standard deviation and probability value (sig.) for the responses to the availability of clients' capital building elements in the KPC work environment.

There is a relatively high agreement on the good reputation of KPC within the Kuwaiti society as the sample of the study showed its agreement on the statement No. 38 by nearly 90% which came in first rank with an average of 3.81 (total score of 5), relative value of 78.16, test value is 19.62 and probability value (sig) is 0.000. Therefore, this is statistically significant at significant level $\alpha = 0.05$ indicating that the average response rate for this paragraph has exceeded the mean score of 3. This means that there is agreement by the sample respondents on this paragraph concerning the existence of a good reputation for the corporation in the Kuwaiti society:

- As shown in the analysis of Tables A6 and A7, the statements 34 and 36, regarding having good relations with clients and suppliers, have achieved relatively high results with an average of 3.78 and 3.72 (the total score of 5) and a relative value of 77.54, 73.01 and test value 17.83 and 17.78 respectively and the probability value (sig.) is 0.000.
- Therefore, these statements are statistically significant at significant level $\alpha = 0.05$ indicating that the average response rate for these statements has exceeded the mean score 3. This means that there is agreement by the sample respondents on this statement, which gives an indication of the corporation's interest in the relations with the main partners and therefore support the intellectual capital of the corporation.
- In general, the arithmetic mean of all statements is 3.75, the relative arithmetic mean is 71.04, the test value is 16.03 and the probability value (sig) is 0.000. Therefore, this group is statistically significant at significant level $\alpha = 0.05$ indicating that the average response to this field varies essentially from the mean score of 3. This means that the sample of the research is aware of the availability of the capital elements of the clients in KPC.

Second axis: Determining the extent to which the study sample practice the organizational innovation in Kuwait petroleum corporation work environment

It is clear from the analysis of Tables A8 and A9 that the ranking of the responses of the study sample to organizational innovation in the KPC work environment came as follows:

- There is a relatively high agreement for the management to provide an organizational climate that encourages creativity and innovation by employees. The study sample showed its agreement on the statement No. 45 by about 85%. It ranked first with an average of 3.82 (total score of 5), a relative value of 74.50 and a test value of 19.78 and probability value (sig) is 0.000. Therefore, this paragraph is considered statistically significant at a significant level $\alpha = 0.05$, which indicates that the average response rate for this paragraph has exceeded the mean score 3. This means that there is agreement by the sample on this paragraph that the management must provide an organizational climate that encourages creativity and innovation. The researcher attributed this to the recognition of the management in the corporation the importance of creativity and the support of innovators, which is consistent with the Talent Management Initiative adopted by the corporation, which was referred to in the previous section of the description of the study population.
- As shown in the analysis of Tables A8 and A9, the terms 43 and 49, which enhance and support the innovators by the management and encourage creative ideas and support their implementation, achieved relatively high results with an average of 3.49 and 3.66 (the total score of 5), test value of 17.83 and 17.11 respectively and probability value (sig.) is 0.000. Therefore, these statements are statistically significant at significant level $\alpha = 0.05$, indicating that the average response rate of these statements has exceeded the mean score of 3. This means that there is agreement by the sample members on this statement, which shows the interest of the corporation in innovators and creative ideas and therefore supporting the practice of organizational innovation within the organization.

Third axis: Test hypotheses of the study

Table A10 shows that the Pearson coefficient of intellectual capital is 0.663, that of organizational innovation is 0.722 and the probability value (sig) is 0.000, which is less than the significant level $\alpha = 0.05$, therefore there is a positive relationship.

The validity of the research hypothesis is clear: "There is a strong positive effect of statistical significance at a significant level (0.05α) between intellectual capital and organizational innovation in KPC".

As well as acceptance of the affiliated hypotheses as noted from Table no. (14). The following:

- *Human capital*: came in first rank in terms of relative importance, with an arithmetic mean of 3.79 and a relative arithmetic mean of 74.64. According to the level of acceptance of the study, this value is high, indicating a positive relationship with organizational innovation at a significance level of ($\alpha \geq 0.05$).
- *Structural capital*: ranked third in terms of relative importance, with an arithmetic mean of 3.63 and a relative arithmetic mean of 70.64. According to the level of acceptance of the study, this value is high, indicating a positive relationship with organizational innovation at a significance level ($\alpha \geq 0.05$).
- *Client capital*: ranked second in terms of relative importance, with an arithmetic mean of 3.75 and a relative arithmetic mean of 71.04. According to the level of

acceptance, this value is high, indicating a positive relationship with organizational innovation at a significance level of ($\alpha \geq 0.05$).

Fourth: Conclusions

First: The findings of the study. The research, in general, demonstrated the importance of human capital as the organization's most valuable assets, especially as it supports creativity and innovation, thus enabling competitiveness. The research stressed that human capital is the most important element in the formation of intellectual capital, which requires decision-makers to support it and give the intellectual and human aspects a strategic content that meets the needs to develop innovation and institutional education and to recruit systems and indicators to measure the performance objectively to achieve the goal of survival of the corporation in a competitive sustainable environment, through providing material and moral potentials that can support the implementation of organizational innovation at various levels:

- The elements of the human capital building needs more attention within KPC, starting from the recruitment, selection and hiring processes and selecting the appropriate training tracks, in accordance with the precise identification of the training needs, through a comprehensive assessment of each employee including the assessment of functional and behavioral efficiencies in a fair way. Then, designing the training content to cover weaknesses in the employee's performance, and ensures upgrading their skills level. The study also points the need to link career paths and training courses to ensure the seriousness of the training process. It is also necessary to expand granting sufficient powers to the employees to carry out the tasks entrusted to them, which helps to empower workers, prepare a secondary staff, and encourage them to work as a team, and this can be done by raising the efficiency of information systems and the expansion of the use of Information Technology and setting timing for the performance of each service.

The researcher attributes this to the management's perception of the importance of developing work systems and reliance on technology:

- The field study pointed out the need more of the elements of structural capital building by supporting the leadership of the workers because of their motivational and effective role. In addition, Leaders adopting work systems that are transparent and fair in granting incentives and promotions. The establishment of clear and known criteria for performance and the identification of organizational relations helps to build the structural capital of the institution, especially when the employees are convinced with the need to develop the work systems and the need to provide an annual budget for research operations and the development of work technology.
- The field study showed that the elements of building of customers capital needs more attention in the institution, especially in regards the relationship between the institution and its customers, and the need to have periodic meetings between them to identify their proposals for product development, and should pay attention to respond directly to customer complaints, and measuring customer satisfaction continuously. Which reflects positively on building a good reputation within the community.
- The field study indicated that the management does not support the employees in practicing the organizational innovation within the work environment. The

management does not encourage workers who think outside their field of specialty, and there is no institutional system to organize brainstorming sessions to solve problems and develop the work environment. The Foundation also lacks the mechanism to motivate those with outstanding ideas or to pursue the implementation of creative ideas in reality.

- In general, the field study showed a positive relationship between intellectual capital and its human, structural, customer components and individuals' practice of organizational innovation within KPC.

The study showed that there is a relative agreement between the research sample on the existence of the organizational climate that encourages creativity and innovation by the employees, the presence of good training in the institution and the compatibility of the training programs with the actual needs of the employees, as well as linking the training paths and career paths to upgrade the corporation. This is due to the employees' awareness of the importance of training and its role in uplifting their performance, as well as the awareness of the Corporation of the importance of training and building the capacity of the human element. This is in line with the strategic plan of the corporation, which adopted several initiatives to develop the human element. In addition, the results confirmed that the prevailing procedures and methods of work in KPC are simple and have some constraints for proper functioning such as complexity of the procedures.

Within the framework of the research findings, a number of Practical recommendations for decision-makers in the KPC can be made to ensure the role of intellectual capital in supporting organizational innovation within KPC, these are:

- The holistic view of intellectual capital in the Corporation, so that the focus is on human capital, structural capital and client capital.
- Increasing the efficiency of information systems, expanding the use of information technology and determining the timing of performance of each service.
- Supporting the scientific research and innovation policies in the Corporation, monitoring the annual financial awards for employees given to the best creative idea during the year and allocation of an agreed percentage of the budget of the Corporation, to promote innovation and research.
- Proper deploying of the human element in the Corporation, starting from attraction and recruitment and putting the right person in the right place, which enhances the experience and creative thinking skills of the staff. Leaders need to increase their attention within the Corporation on performance evaluation processes of employees and not only assessing their performance.
- The need to work on enabling the human elements in the Corporation to support the building of human capital, as the main component of intellectual capital, through training programs and the delegation of authority and support confidence between employees and managers.
- Creating work teams characterized by diversity and different point of views. The more diverse these groups are, the more they will gain insights and new ideas that contribute in creative thinking.
- The Corporation must adopt systems for talent discovery and sponsorship, provide financial support to them through a department responsible for the care and support of gifted people, providing them scholarships and supporting their ideas and helping them to implement these ideas.

- Encourage exchanging ideas by supporting annual conferences or forums to display the best practices in building intellectual capital. Thus, supporting the dissemination of the culture of knowledge.
- Find electronic communication channels to communicate between senior management and employees that allow employees to participate in decision-making and decision-making.
- Providing material incentives for people with innovative ideas in the field of work.
- Holding consultative sessions with stakeholders and suppliers to listen to their proposals to develop the business and solve their problems in a way that supports customer capital.
- Supporting the company's social participation in community activities, which contributes to building a positive mental image of the company within Kuwaiti society.
- Spreading a culture of learning and developmental thinking through holding training programs for all employees of the company to train in the processes of creativity and innovation.
- 14. Exchanging institutional visits with leading companies in the same field to gain experience and capture best global practices.

Future Studies: There is a need for more studies on the factors that help in the formation of intellectual capital and how modern organizations adopt them, especially the factors related to the quality of work life and its effects on the creative environment within Arab organizations.

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Corresponding author

Hanan Ali Almutirat can be contacted at: h2n2n@hotmail.com

Appendix

Impact of
intellectual
capital

The field	No. of paragraphs	Cronbach's alpha coefficient	Self- consistency *
Dimensions of the availability of human capital components in KPC work environment	18	0.952	0.979
Dimensions of the availability of structural capital components in KPC work environment	11	0.943	0.976
Dimensions of the availability of client capital in KPC work environment	9	0.941	0.974
Dimensions of the role of intellectual capital with its components in practicing organizational innovation in KPC work environment	8	0.940	0.972
<i>All fields together</i>	<i>46</i>	<i>0.948</i>	<i>0.981</i>

Note: *Self-consistency = positive quadratic root of the Cronbach's alpha coefficient

Table A1.
Cronbach's alpha
coefficient measures
the validity of the
questionnaire

Table A2.
Frequency of
responses to the
availability of human
capital building
components in the
KPC work
environment

No. of statement	The statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
5	Human resources are recruited and assigned to the organization	98	72	93	36	21
6	The corporation has training programs for all employees	182	67	41	18	12
7	Training programs cover the actual training needs of employees	148	96	64	12	–
8	Employees have the appropriate qualifications to perform their duties	132	128	44	16	–
9	There is a specific and clear training plan for each employee (training course)	96	104	44	40	36
10	Employees recognize the tasks they are required to perform	164	90	58	8	–
11	Employees have sufficient powers to carry out the tasks required of them	54	62	165	8	31
12	There is transparency in granting incentives and rewards	96	144	66	14	–
13	I feel fairness in the applied performance appraisal systems	134	122	24	33	7
14	Senior management is keen to form a second tier of leaders	108	69	44	43	56
15	Managers are encouraged to work in one team as a family	186	103	31	–	–
16	There are periodic meetings between senior management and staff to explain the work objectives and plans	68	54	89	72	37
17	Our boss balances between work requirements and management requirements	106	86	89	36	3
18	There is a gap between employees' salaries and incentives and what they deserve	41	58	59	107	55
19	There is a real involvement of employees in problem solving and decision-making	42	28	101	127	22
20	The corporation has many moral advantages that ensures the welfare of employees	117	109	67	27	–
21	There is a link between the training paths and career paths in the organization's promotions	232	76	12	–	–
22	Employees can get promotions easily	24	42	112	56	86

No. of statement	The statement	Arithmetic mean	SD	Relative arithmetic mean	Test value	Probability value (sig.)
5	Human resources are recruited and assigned to the organization	3.38	0.67	67.54	10.83	0.000*
6	The corporation has training programs for all employees	3.72	0.82	70.36	12.07	0.000*
7	Training programs cover the actual training needs of employees	3.72	0.74	74.50	18.78	0.000*
8	Employees have the appropriate qualifications to perform their duties	3.48	0.73	69.58	12.60	0.000*
9	There is a specific and clear training plan for each employee (training course)	3.61	0.78	68.16	10.00	0.000*
10	Employees recognize the tasks they are required to perform	3.40	0.75	67.94	10.12	0.000*
11	Employees have sufficient powers to carry out the tasks required of them	3.21	0.67	63.01	7.11	0.000*
12	There is transparency in granting incentives and rewards	3.55	0.67	75.10	18.49	0.000*
13	I feel fair in the applied performance appraisal systems	3.31	0.86	66.12	6.82	0.000*
14	Senior management is keen to form a second tier of leaders	3.19	0.95	63.77	3.79	0.000*
15	Managers are encouraged to work on one team as a family	3.52	0.82	70.36	12.07	0.000*
16	There are periodic meetings between senior management and staff to explain the work objectives and plans	3.38	0.67	67.54	10.83	0.000*
17	Our boss balances between work requirements and management requirements	3.52	0.82	70.36	12.07	0.000*
18	There is a gap between employees' salaries and incentives and what they deserve	3.71	0.73	74.40	18.68	0.000*
19	There is a real involvement of employees in problem solving and decision-making	3.11	0.67	65.01	7.21	0.000*
20	The corporation has many moral advantages that ensures the welfare of employees	3.41	0.78	68.16	10.00	0.000*
21	There is a link between the training paths and career paths of the organization's promotions	3.90	0.75	67.94	10.12	0.000*
22	Employees can get promotions easily	3.38	0.70	67.78	12.10	0.000*
	<i>All paragraphs of the field together</i>	<i>3.79</i>	<i>0.74</i>	<i>74.64</i>	<i>18.03</i>	<i>0.000*</i>

Note: The arithmetic mean is statistically significant at $\alpha = 0.05$

Table A3.
Arithmetic mean,
standard deviation
and probability value
(sig.) for the
responses to the
availability of human
capital building
elements in KPC
work environment

Table A4.
The frequency of
responses to the
availability of
structural capital
structure in the KPC
work environment

No. of statement	The statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
23	The prevailing procedures and work systems are free of work obstacles	112	72	53	55	28
24	Transparency and justice are clear policies applied in the corporation	86	67	98	30	39
25	There are standards and timing for completion of each task within the corporation	118	96	64	12	30
26	The work objectives are clear and specific to everyone	110	128	44	22	16
27	Decentralization and delegation of powers is a clear administrative phenomenon in the corporation	96	104	64	40	16
28	Management is concerned with quality systems and institutional excellence	124	98	77	19	2
29	The corporation has an information system that gives information in a timely and accurate manner	154	89	45	8	34
30	There is a clear definition of organizational relationships and communication lines between departments within the corporation	86	134	76	12	12
31	There is a conviction among employees that developing work systems is necessary	64	68	54	63	71
32	The company follows up and adopts the latest scientific and technical developments in the field of modern technology	108	64	49	56	43
33	The corporation provides a specific annual budget for research and development	56	103	104	57	—

No. of statement	The statement	Arithmetic mean	SD	Relative arithmetic mean	Test value	Probability value (sig.)
23	The prevailing procedures and work systems are free of work obstacles	3.78	0.67	77.54	19.83	0.000*
24	Transparency and justice are clear policies applied in the corporation	3.42	0.82	70.36	12.07	0.000*
25	There are standards and timing for completion of each task within the corporation	3.62	0.74	74.50	15.78	0.000*
26	The work objectives are clear and specific to everyone	3.48	0.73	69.58	12.60	0.000*
27	Decentralization and delegation of powers is a clear administrative phenomenon in the corporation	3.61	0.78	68.16	12.01	0.000*
28	Management is concerned with quality systems and institutional excellence	3.40	0.75	67.94	10.12	0.000*
29	The corporation has an information system that gives information in a timely and accurate manner	3.71	0.67	73.01	19.11	0.000*
30	There is a clear definition of organizational relationships and communication lines between departments within the corporation	3.55	0.67	75.10	18.49	0.000*
31	There is a conviction among employees that developing work systems is necessary	3.51	0.86	68.12	10.82	0.000*
32	The company follows up and adopts the latest scientific and technical developments in the field of modern technology	3.69	0.95	73.77	13.79	0.000*
33	The corporation provides a specific annual budget for research and development	3.42	0.82	69.36	12.77	0.000*
	<i>All paragraphs of the field together</i>	<i>3.63</i>	<i>0.74</i>	<i>70.64</i>	<i>13.03</i>	<i>0.000*</i>

Table A5.

Arithmetic mean,
standard deviation
and probability value
(sig.)

Notes: Responses to the availability of structural capital building elements in KPC work environment. The arithmetic mean is statistically significant at $\alpha = 0.05$

No. of statement	The statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
34	The corporation has good relations with its customers	184	82	45	15	4
35	We have an interest in responding directly to customer complaints	124	98	77	19	2
36	The corporation has a strong network of suppliers	168	96	64	32	–
37	We have periodic system to meet with customers to develop products and identify their ideas	102	128	44	16	30
38	The corporation has a good reputation within the community	176	104	36	–	4
39	The corporation supports its work plans at the international level	164	90	58	8	–
40	The corporation sponsors many voluntary activities and events within the Kuwaiti society	165	73	54	8	20
41	The corporation has periodic studies to measure customer satisfaction	94	48	166	12	–

Table A6.

The frequency of
responses to the
availability of capital
building components
in the work
environment of KPC

Table A7.
Arithmetic mean,
standard deviation
and probability value
(sig.) for the
responses to the
availability of clients'
capital building
elements in the KPC
work environment

No. of statement	The statement	Arithmetic mean	SD	Relative arithmetic mean	Test value	Probability value (sig.)
34	The corporation has good relations with its customers	3.78	0.67	77.54	17.83	0.000*
35	We have an interest in responding directly to customer complaints	3.72	0.82	70.36	16.07	0.000*
36	The corporation has a strong network of suppliers	3.72	0.74	74.50	17.78	0.000*
37	We have periodic system to meet with customers to develop products and identify their ideas	3.48	0.73	69.58	12.60	0.000*
38	The corporation has a good reputation within the community	3.81	0.78	78.16	19.62	0.000*
39	The corporation supports its work plans at the international level	3.77	0.75	77.94	17.12	0.000*
40	The corporation sponsors many voluntary activities and events within the Kuwaiti society	3.76	0.67	73.01	17.11	0.000*
41	The corporation has periodic studies to measure customer satisfaction	3.55	0.67	71.10	15.49	0.000*
42	The corporation is committed to local and international laws regulating the work environment	3.61	0.86	66.12	13.82	0.000*
	<i>All paragraphs of the field together</i>	3.75	0.74	71.04	16.03	0.000*
Note: The arithmetic mean is statistically significant at $\alpha = 0.05$						

Table A8.
Frequency by which
the respondents of
the study sample
practice the
organizational
innovation in KPC
work environment

No. of statement	The statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
43	Management encourages employees who are thinking outside of their specialty	106	88	45	19	62
44	We have a management to follow up the creative ideas of employees and customers	94	28	78	70	50
45	Management creates an organizational climate that encourages employees' creativity and innovation	168	96	54	30	12
46	There are open communication channels between senior management and staff to convey proposals and developmental ideas	102	118	44	20	36
47	I have the ability to present creative ideas and discuss them with the direct manager	126	104	36	50	4
48		64	80	58	58	60

No. of statement	The statement	Arithmetic mean	SD	Relative arithmetic mean	Test value	Probability value (sig.)
43	Management encourages employees who are thinking outside of their specialty	3.49	0.67	77.54	17.83	0.000*
44	We have a management to follow up the creative ideas of employees and customers	3.12	0.82	70.36	11.07	0.000*
45	Management creates an organizational climate that encourages employees' creativity and innovation	3.82	0.74	74.50	19.78	0.000*
46	There are open communication channels between senior management and staff to convey proposals and development ideas	3.48	0.73	69.58	12.60	0.000*
47	I have the ability to present creative ideas and discuss them with the direct manager	3.21	0.78	78.16	13.62	0.000*
48	The department organizes brainstorming sessions to share ideas with employees	3.17	0.75	77.94	10.12	0.000*
49	The management supports the implementation of creative proposals and ideas	3.66	0.67	76.01	17.11	0.000*
50	We have a mechanism to motivate employees with distinctive ideas	3.25	0.67	69.10	12.49	0.000*
	<i>All paragraphs of the field together</i>	<i>3.64</i>	<i>0.74</i>	<i>72.24</i>	<i>17.03</i>	<i>0.000*</i>

Note: The arithmetic mean is statistically significant at $\alpha = 0.05$

Table A9.
Arithmetic mean,
standard deviation
and probability value
(sig.) for the
responses on the
frequency by which
the respondents of
the study sample
practice the
organizational
innovation in KPC
work environment

Serial no.	Item	Arithmetic mean	Relative arithmetic mean	Pearson test coefficient	Probability value (sig.)
1	Human capital	3.79	74.64	0.687	0.000*
2	Structural capital	3.63	70.64	0.625	0.000*
3	Client capital	3.75	71.04	0.677	0.000*
4	Intellectual capital (average value of components)	3.72	72.1	0.663	0.000*
5	Organizational innovation	3.64	72.24	0.722	0.000*

Note: The arithmetic mean is statistically significant at $\alpha = 0.05$

Table A10.
The correlation
coefficient between
the components of
intellectual capital
and organizational
innovation

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