Volume 2, Issue 4
December 2018

Designing a Suitable Intellectual Capital Reporting Framework in Iran's Oil Industry

Iman Dadashi[a*], Hamid Reza Gholamnia Roshan[b] and Amir Firooznia[c]

[a] Assistant Professor, Department of Accounting, Babol branch, Islamic Azad University, Babol , Iran, Email: idadashi@baboliau.ac.ir
[b] Assistant Professor, Department of Accounting, Babol branch, Islamic Azad University, Babol , Iran, Email: hamid_r_2057@baboliau.ac.ir
c PhD student of accounting, Department of Accounting, Babol branch, Islamic Azad University, Babol, Iran, Email: a.firooznia@rastaedg.com

ARTICLE INFO

Keywords:
INTELLECTUAL CAPITAL, FINANCIAL REPORTING, INFORMATION ASYMMETRY, OIL INDUSTRY COMPANIES, THEMATIC ANALYSIS

Received: 9 Aug. 2018
Revised: 11 Sep. 2018
Accepted: 30 Oct. 2018

ABSTRACT

Due to the importance of technology and innovation in the oil industry, it is necessary to look more closely at the intellectual property of this industry. Intellectual capital is a concept which can classify and report the technology capabilities and knowledge spillover in a comparative format. The present research aims to provide an appropriate framework for reporting intellectual capital of companies in the oil industry. To this end, semi-structured interviews with 15 experts and people from petrochemical and petroleum companies with an intellectual and experiential thinking space were conducted. After the interview, the relevant data were analyzed by the thematic analysis method. Finally, the intellectual capital reporting framework was extracted as a qualitative research product. Then, a questionnaire was designed to assess the acceptance of the qualitative model and distributed among the statistical community consisting of the professors, Ph.D. students, and experts of different universities and companies. The results of the distributed questionnaire confirmed that the components of the framework were approved by the respondents.

1. Introduction

In today's world economic system, most of the wealth creation resources are based on non-physical features of organizations and companies such as knowledge and skills. In the past decades, physical assets such as machinery, equipment, and finance were the main resources of capital and profit creation by companies. Nowadays, however, knowledge and skill-based resources and generally the organization's intellectual capital have become more important than the other sources of wealth creation. Peter Drucker (1993), a key figure in management science, points out that in the coming era the more levels of physical capital, natural resources, and labor are not the main resources of the economy, but the main important resource is the knowledge; the current era is the knowledge era.

The identification and evaluation of the organization's intellectual capital is among the most important issues of the current decade, which has appeared in various fields of human sciences, specifically management and accounting. The importance of these kinds of capitals is continually increasing, and nowadays organizations and companies try to estimate the values these capitals and assets and include them in financial statements (for external organizational purposes) and management reports (for internal organizational purposes). Despite the importance of this issue, a considerable effort has not been made to identify and value these resources in our country.

Many attentions have been paid to intellectual capital reporting as a new technique in accounting, which can bring substantial organizational changes,

* Corresponding Author

especially in improving business performance at the company level. However, intellectual capital reporting as a management tool was criticized for its limited practical impact. Researchers have recently found that this can largely lead to success in developing countries (Yu et al., 2017).

Measuring the intellectual capital includes some criteria such as valuation and growth and some assets like ideas and thoughts, innovations, and creativity in various parts of the knowledge which are not considered as asset according to the traditional tools and standards of accounting. However, new valuation systems indicate and consider the effect of these assets on the market value of a company or organization. This matter also appears when comparing developed and developing countries because growth cannot be justified only based on tangible assets, and in many situations, high investment rates have an information-based and knowledge-based infrastructure.

Defining and identifying the criteria and indicators of intellectual capital and evaluating these capitals are one of the major problems and challenges of the organizations in the world today. Since our country is also moving towards a knowledge-based economy, where various policies such as the Sixth Economic Development Plan and Resistance Economics and the emphasis on internal power have been pointed out, the necessity for more attention to knowledge-based companies and organizations and the dimensions of their intellectual capital and reporting is felt. Hence, this paper aims to play a role in the theoretical and practical development of this area of knowledge by identifying the dimensions and components affecting the intellectual capital reporting of companies in the oil industry.

2. Theoretical foundations

Considering the magnitude of the oil industry in Iran having more than 200,000 people with a high level of expertise in the industry and its linkage to different sectors of the economy, measuring and reporting intellectual capital in this industry is of great importance. Therefore, a model should be designed and presented to identify and report intellectual capital of oil companies, especially the National Iranian Oil Company. Moreover, as stated above, the significant number of human resources in the industry with the education and professional expertise, the specific requirements of this industry from a strategic perspective, and the role of knowledge and technology in its development signifies the issue of intellectual capital in this industry and attaches particular importance to scientific and academic research in order to cover some of the existing gaps in its reporting and, consequently, the proper management of its items.

Intellectual capital as an intangible asset produced within an organization is itself a strategic source enabling the company to create a competitive advantage and superiority in financial performance. However, due to the poor reporting of its items, there is a kind of information asymmetry between management and the shareholders of the company in this area, which may lead to an increase in agency costs.

On the other hand, in a resource-based view, the superior performance of companies can result from the uniqueness and integrity of their resources or their ability to respond to the environment on time. In this context, differences in the performance of companies come from the fact that successful organizations benefit from the strategic (physical, human, and organizational) resources their competitors lack. Therefore, the difference in resources plays a significant role in the company's profitability. Although intellectual capital has a direct impact on the company's performance as one of its resources, it is neglected in the reporting process of the company.

The importance of intangible assets for the value creation process is increasing in all companies. While intangible assets averaged only 5% of the company's total assets in 1978, in the current economy, approximately 50-90% of the value created by the company originates from the intellectual capital management rather than the production of physical products (Chareonsuk and Chansa, 2008).

According to the empirical researches by Amir and Lev (1996), it was estimated that only 10 to 15% of the market value of the 100 American companies under study was nearly accurately recorded by traditional measurement instruments, meaning that it is necessary to incorporate non-financial information in the estimation of the companies' value. They believed that the best definition for stock prices could be derived from a mix of financial and non-financial factors. Most experts and scholars believe that the current financial reporting system cannot explain and report new resources such as intangible assets of the company, including communications and knowledge accumulation. Reporting such information can decrease the company's cost of capital by reducing the

uncertainty about future prospects and providing more accurate basis for valuation.

Generally, to more focus on the destructive effects of the lack of intellectual capital reporting in companies, the following reasons can be noted for the necessity of external reporting of intellectual capital.

• Minor stakeholders may be deprived of some information because they generally do not have access to information about the intangible assets of companies often issued in private meetings with major stakeholders (Shuai and Wang, 2010).

• Managers may abuse internal information generated on intangible items which are unknown to other investors and may engage in inside trading (Aboody and Lev, 2000).

• The liquidity of the stock market and demand for companies' securities are increased by further revealing intangible items (Diamond and Verrecchia, 1991).

• Stock fluctuations and the risk of false valuation growth, which causes investors and banks to consider a higher level of risk for companies.

• Placing higher levels of risk on companies increases the cost of capital.

3. Literature review

The concept of intellectual capital was initially presented by Peter Drucker in the field of management in describing the post-capitalist society. At the end of the 1990s, the concept of intellectual capital and knowledge in the scientific resources of management and business became widespread (Bontis, 2002). Over time, intellectual capital management has become a broad scope and has entered into the areas of financial reporting and accounting of organizations. In an initial research on voluntary intellectual capital disclosure, Guthrie and Petty (2000) investigated the reporting manner of the top 20 Australian companies in six different industries. They measured the extent and range of different levels of intellectual capital published in the annual reports of companies using the content analysis. They examined 24 variables of three components of the intellectual capital of which six variables were related to human capital, nine were related to structural capital, and nine were related to relational capital. The results of their research revealed that 30% of disclosed items were related to structural capital, that about 40% was related to relational capital, and that about 30% was related to human capital.

Capello and Faggian (2005) in a research concluded that, contrary to the past when innovation and creating value-added were considered to occur by large-sized companies, small and knowledge-based companies have more innovative capacity, which is related to the attention to the knowledge spillover in these companies and fortifying their relational capital and collective learning. In other words, the confrontation of these companies with external factors and the positive relationship with the knowledge environment increase the intellectual capital and then the human capital and relational capital of these companies. Therefore, intellectual capital is conceptually beyond human capital and is a combination of human, structural, and relational resources of the company. The components of intellectual capital and their weights show how these components interact with enhancing the knowledge function and its value for the whole organization (Chaminade and Roberts, 2003).

Some studies in the field of intellectual capital reporting have shown that the qualitative, but not quantitative, disclosure of intellectual capital has the greatest benefit to companies in terms of cost-benefit. Quantitative and mathematical models of the intellectual capital disclosure are not positively referenced and are often caught in the trap of balance between reliability and relevance. Moreover, the fear of separated costs may also prevent companies from engaging in quantitative and reliable disclosure of intellectual capital information (Bellora and Guenther, 2015).

Ola et al. (2016) studied the relationship between intellectual capital and productivity in pharmaceutical companies. They investigated a sample of 19 companies and used the intangible value model to measure the value of intellectual capital and the Pulic model to analyze the intellectual capital efficiency. They also calculated productivity using the value-added ratio obtained for each employee. Finally, the results indicated that there is a positive and significant relationship between the value of intellectual capital and productivity.

Kianto et al. (2018) argued that in order to remain relevant in the face of the increasing knowledge intensity of work, organizing, and value creation, the measurements of intellectual capital (IC) should revisit the foundations of what knowledge is. In order to regain this understanding, they proposed four critical themes that should be better recognized in IC measurement: multi-dimensionality, human

agency and action, conceptuality, and temporality and dynamics.

Chia and Chien (2019) in their research concluded that, overall, the human, process, and customer capitals are major dimensions that affect the oil industry in maintaining good operating performance. The findings can serve as a reference to the operating performance evaluation of oil industry firms and to the establishment of a well-planned management system, thereby giving the service quality and operating performance of the accounting firms an advantage.

Adesina (2019) examined the effects of intellectual capital (IC) on technical, allocative, and cost efficiencies for a panel of 339 commercial banks operating in 31 African countries over the 2005–2015 period. His findings, which are based on Tobit and one-step generalized method of moments (GMM) regressions, provide evidence that IC have positive effects on bank technical, allocative, and cost efficiencies.

4. Methodology

This research is an applied research in terms of the purpose. On the other hand, in terms of the nature of data (and analysis methods), it is a qualitative exploratory research and deals with qualitative data. A qualitative research is referred to as any kind of research the findings of which are not derived by statistical operations or numerical methods. A qualitative analysis has a completely different approach to data. In this type of research, the researcher should examine and analyze the documents and information logically and thoughtfully to discover the truth and facts and to judge the hypotheses (Hafeznia, 2006).

4.1. Thematic analysis

In this work, the thematic analysis is applied to analyzing the data. Among the diverse and complex qualitative approaches, the thematic analysis utilizes a suitable and flexible approach to analyzing qualitative data (Brown and Clark, 2006). The thematic analysis is suitable for identifying, analyzing, and reporting patterns (themes) within the data. Each theme contains an important fact about the data related to the research question. The researcher's judgment is necessary to determine the research themes.

4.2 Codes generation

Codes are features of data (semantic or content) which seem to be interesting for analysis. The codes combining with each other form the themes. In this study, English letters and numbers are applied to coding as follows:

The interviewees are coded using English letters. The letters A to O are used here according to the total number of the interviewees, which were 15.

A special number is assigned to indicate the code number related to each important or influential phrase so as to access the main themes and conceptual categories from the researcher's point of view. This code begins at 1 for each text (the interviewee) and is increased naturally.

Each analysis unit (any text or interview) is numbered with one of the letters A to O. The codes in each analysis unit also start at 01, and the number of the code for that unit of analysis is incremented by one unit in the domain of the natural numbers. Therefore, each code consists of two components: the first one is the English letter assigned, and the second specifies the number of the targeted analysis unit.

4.3 Statistical population and the sample

For the semi-structured interviews, the statistical community includes the professors of the accounting discipline with at least a degree of associate professor, as well as the managers and experts of seven companies, including Pars Oil and Gas Company, Iranian Offshore Oil Company, Kalanaft Company, Petroleum Industry Health Organization, National Iranian South Oil Company, Iranian Central Oil Field Company, and Iranian Oil Pipelines and Telecommunication Company. The statistical population of the questionnaire consists of the above-mentioned statistical population plus Ph.D. graduates and students in the fields of accounting and different subfields of management. The sample used for conducting the interviews includes experts who are identified by the researcher based on previous studies as scholars in the area of intellectual capital. Statistical samples are selected based on the snowball method in which new interviewees are introduced by the previous ones. In snowball sampling, participants are selected in connection with the others, and the selected ones guide the researcher to the other people in the population. In this research, 15 interviews were conducted until theoretical saturation was achieved. Since it was not possible to provide a complete population framework for random sampling, a judgmental or accessible sample was used. 76 out of 109 distributed questionnaires were completed and delivered to the researcher.

Table 1 - Thematic analysis along with the codes of each theme.

No. of the main themes	Description of the main theme	No. of the sub-themes	Description of the sub-theme	No. of the concepts	Description of the concept	Code num ber
A	Human capital	A1	Individual dimension of human capital	A1-1	Technical staff	C2-D4-O1-P2-L2
				A1-2	Upstream section	C3-B2-B6-K3-J10-I2
				A1-3	Training and education	C2- E2-F3
				A1-4	Highly skilled engineers	A4-D2-H2-P11
				A1-5	Downstream section	G3-F8
				A1-6	Good English knowledge	C3-C4-E1
				A1-7	Specific job requirements	D4-F2-M2
				A1-7	Specific job requirements	D2-F4-G9-O5
		A2	Occupational (professional) dimension of human capital	A2-1	Work discipline and environment	D2-K2
B	Relational capital		External relational capital	B1-1	Oil customers	J2-K4-G4
				B1-2	Specific customers	C1-E2-B5- D2- H2- I3
				B1-3	Customer long-term relationship	C1-E2-B5- H2
				B1-4	Virtual cooperation	G4
				B1-5	Customers' royalty	B7-K1-I3
				B1-6	Favorable contracts	H11-M4
				B1-7	Limited number of customers' cooperation	I3-D3-E3
			B2	B2-1	Personnel relations	D8-F7-H6
				B2-2	Joint work meetings	D6-H6-J10-O12
				B2-3	Managers' reputation	M4
				B2-4	Managers' dealing mode with each employee	D9-I8-F7
C	Structural capital	C1	Organizational ownerships	C1-1	Integrated laws and rules	P2-B3-O7
				C1-2	Reward system	N2-O5
				C1-3	High disciplined environment	A1-J11
		C2	Organizational structures	C2-1	Special equipment & infrastructure	D13-N3
				C2-2	Hierarchical supervision	C5-B7-D2-F1- G1- I2- L2-N1-P2
				C2-3	Oil resources	D2- G3-J2
				C2-4	Huge infrastructures	H1
D	The importance of intellectual capital measurement and reporting	D1	Intellectual capital-related aspects	D1-1	Equal importance of intellectual and physical capital in the oil industry	C1-B1- F2- M1-N1-O1
				D1-2	Importance of evaluating disclosure of IC information	B1-D2- F2- H7- L5- P4
				D1-3	Using as a management tool in the oil industry	B1-D6-M1-N1-O1
				D1-4	The role of knowledge in new discoveries	C1-B1- F2
				D1-5	Distinguishing between the quality of IC in oil and other industries	F2- N1
				D1-6	The large number of skilled personnel in the oil industry	I1-C2- E6- B3
				D1-7	Cost-benefit consideration	G6- C6- E4- H1
				D1-8	Auditing intellectual capital reports	D23-G17-H13- L16-M9-N7-O8
		D2	Infrastructures required at the macroeconomic level of the country	D2-1	More competitive economic environment	B5-D6-F2-J6-O11
				D2-2	Development of knowledge-based companies	C9- K6-L8-N2
				D2-3	Economic structure of the country	B3-F11-M9-K8
				D2-4	Sixth Program of Economic Development	I1-C2- E6- B3-N1-O1
				D2-5	Prerequisites for economic growth	F6-K2-E7
E	Aspects of reporting intellectual capital	E1	Aspects of reporting intellectual capital	E1-1	Attention to value judgment	E2- C3- F11- L7
				E1-2	Measurement problems	H6-E2-C3-F4-I9
				E1-3	Unique framework for reporting	M9-E3-D11-O6
				E1-4	Entering value judgments in reporting	D13-F5-N8
				E1-5	Unreliability of some information	E14-G2-I13
				E1-6	Senior management support	B4-N4-L15-N6

4.4 Data collection method

The data were collected in two ways:

4.4.1. Interview

Considering the background of individuals and using the advice of the relevant experts and professors, the interviews were conducted in total with 15 experts in the area of intellectual capital. It should be noted that according to the snowball method, in each interview, new potential interviewees are introduced by the current interviewee at the request of the researcher to be considered in the next stage. It is also worth noting that the conducted interviews were of a semi-structured type.

4.4.2. Questionnaire

A questionnaire consisting of 46 questions was designed based on the components of the model and was delivered to the experts to evaluate the acceptability of the developed model based on the interviews. The questionnaire measured the degree of the agreement of respondents based on the five-point Likert scale from the complete agreement to complete disagreement.

5. Research findings

5.1 Thematic analysis

The qualitative data obtained by reviewing the texts and interviews were coded and categorized to find the themes. Then, the themes in the data were determined and named. Table 1 represents the results of the thematic analysis along with the theme categories and the codes of each one, based on which the qualitative model is drawn in Figure 1.

Figure 1 represents the model obtained from the analysis of the interview texts using the thematic analysis method. As can be seen in this figure, there are generally three aspects of the importance of intellectual capital reporting from the experts' point of view. In the first part of the framework, items that should be considered in intellectual capital reporting are discovered in three branches of human capital, structural capital, and communication capital. These items are based on the expertise and experience of the interviewees and on the questions asked by the researcher. Furthermore, the importance of intellectual capital reporting of companies in the oil industry was also discussed by the interviewees, which can be seen in the form of the final themes in the framework of

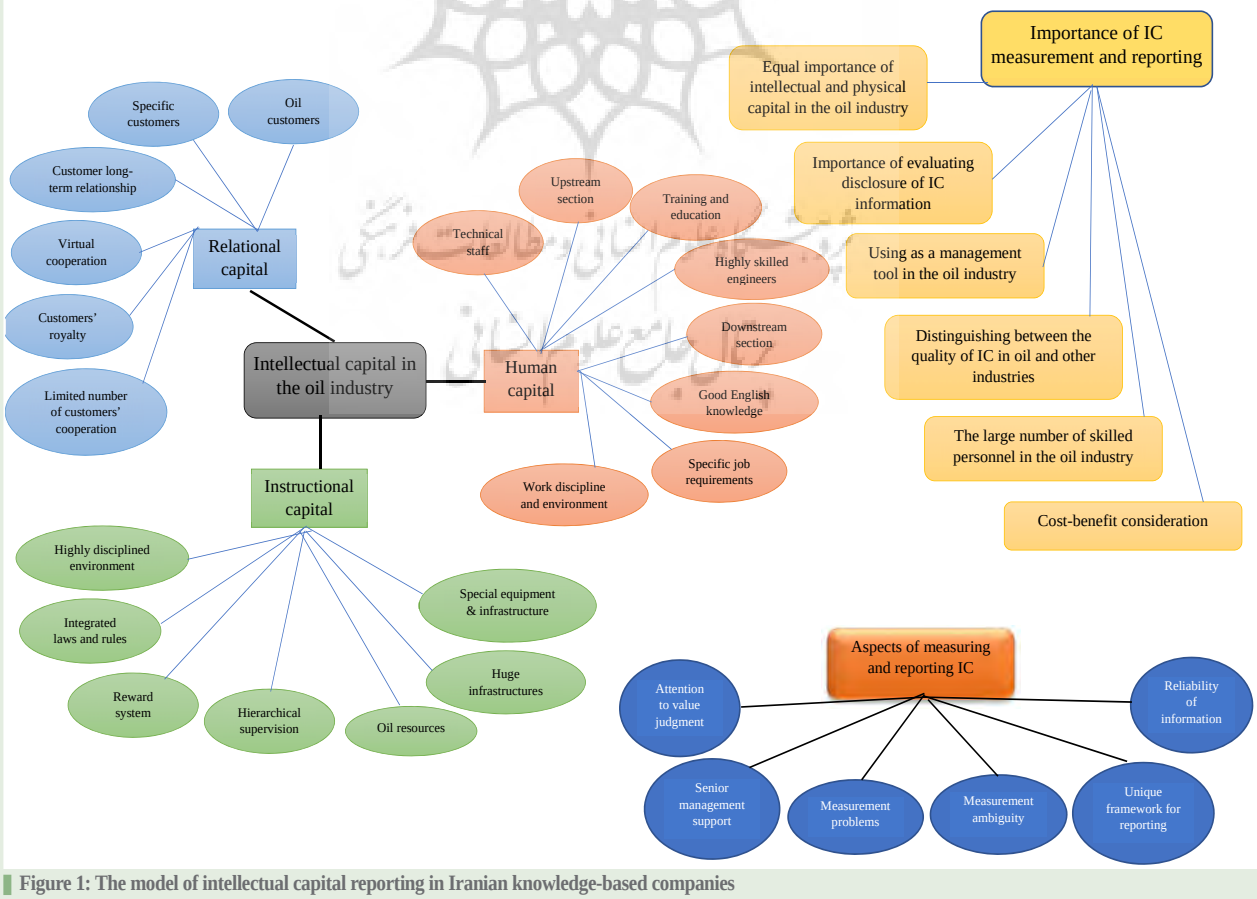

Figure 1: The model of intellectual capital reporting in Iranian knowledge-based companies

Table 2 - Results of the binomial test.

	Question No.	Groups	Groups characteristics	The number of each group	Percentage of each group	Significance	Result
Technical knowledge	1	Group 1	<-3	3	0.04	0.001	✓
		Group 2	>3	73	0.96		
		Total		76	1.00		
Training and education	2	Group 1	<-3	5	0.06	0.000	✓
		Group 2	>3	71	0.94		
		Total		76	1.00		
Job aptitudes	3	Group 1	<-3	11	0.15	0.020	✓
		Group 2	>3	65	0.85		
		Total		76	1.00		
Work-related knowledge	4	Group 1	<-3	31	0.41	0.389	-
		Group 2	>3	45	0.59		
		Total		76	1.00		
Variability	5	Group 1	<-3	14	0.18	0.001	✓
		Group 2	>3	62	0.82		
		Total		76	1.00		
Innovation and on-time response ability	6	Group 1	<-3	10	0.13	0.000	✓
		Group 2	>3	66	0.87		
		Total		76	1.00		
Entrepreneurial characteristics	7	Group 1	<-3	52	0.68	0.803	-
		Group 2	>3	24	0.32		
		Total		76	1.00		
Periodic employee assessment	8	Group 1	<-3	11	0.14	0.041	✓
		Group 2	>3	65	0.86		
		Total		76	1.00		
Professional certificates	9	Group 1	<-3	62	0.81	0.518	-
		Group 2	>3	14	0.19		
		Total		76	1.00		
Business trademarks	10	Group 1	<-3	5	0.07	0.010	✓
		Group 2	>3	71	0.93		
		Total		76	1.00		
The importance of customers	11	Group 1	<-3	70	0.92	0.604	-
		Group 2	>3	6	0.08		
		Total		76	1.00		
Customers' commitment	12	Group 1	<-3	13	0.17	0.003	✓
		Group 2	>3	63	0.83		
		Total		76	1.00		
Returning orders	13	Group 1	<-3	42	0.55	1.000	-
		Group 2	>3	34	0.45		
		Total		76	1.00		
Business cooperation	14	Group 1	<-3	39	0.51	0.614	✓
		Group 2	>3	37	0.49		
		Total		76	1.00		
The number of main customers	15	Group 1	<-3	17	0.22	0.013	✓
		Group 2	>3	59	0.78		
		Total		76	1.00		
Political rents	16	Group 1	<-3	29	0.38	0.041	✓
		Group 2	>3	47	0.61		
		Total		76			
Personnel relations	17	Group 1	<-3	13	0.17	0.019	✓
		Group 2	>3	63	0.83		
		Total		76	1.00		
Joint work meeting	18	Group 1	<-3	19	0.25	0.035	✓
		Group 2	>3	57	0.75		
		Total		76	1.00		
Managers' good reputation	19	Group 1	<-3	9	0.12	0.004	✓
		Group 2	>3	67	0.88		
		Total		76	1.00		
Managers' dealing mode with each employee	20	Group 1	<-3	23	0.16	0.049	✓
		Group 2	>3	53	0.84		
		Total		76	1.00		
Business rights	21	Group 1	<-3	12	0.16	0.043	✓
		Group 2	>3	64	0.84		
		Total		76	1.00		
Product quality indicators	22	Group 1	<-3	18	0.23	0.021	✓
		Group 2	>3	58	0.77		
		Total		76	1.00		
Business secrets	23	Group 1	<-3	50	0.66	1.000	-
		Group 2	>3	26	0.34		
		Total		76	1.00		

	Question No.	Groups	Groups characteristics	The number of each group	Percentage of each group	Significance	Result
Management philosophy	24	Group 1	<-3	14	0.18	0.011	✓
		Group 2	>3	62	0.82		
		Total		76	1.00		
Organizational culture	25	Group 1	<-3	58	0.76	0.003	✓
		Group 2	>3	18	0.24		
		Total		76	1.00		
Managerial processes	26	Group 1	<-3	21	0.27	0.048	✓
		Group 2	>3	55	0.73		
		Total		76	1.00		
Information systems	27	Group 1	<-3	41	0.53	0.811	-
		Group 2	>3	35	0.47		
		Total		76	1.00		
The importance of intellectual capital against physical capital	28	Group 1	<-3	44	0.58		-
		Group 2	>3	32	0.712		
		Total		76	1.00		
The importance of evaluating the disclosure of intellectual capital information	29	Group 1	<-3	31	0.41	0.003	✓
		Group 2	>3	45	0.59		
		Total		76	1.00		
The importance of intellectual capital in knowledge-based companies	30	Group 1	<-3	16	0.21	0.003	-
		Group 2	>3	60	0.79		
		Total		76	1.00		
Using as a management tool	31	Group 1	<-3	58	0.76	0.003	✓
		Group 2	>3	18	0.24		
		Total		76	1.00		
Attention to the quality of intellectual capital	32	Group 1	<-3	21	0.27	0.048	-
		Group 2	>3	55	0.73		
		Total		76	1.00		
Precise valuation of intellectual capital	33	Group 1	<-3	41	0.53	0.811	-
		Group 2	>3	35	0.47		
		Total		76	1.00		
Cost-benefit consideration	34	Group 1	<-3	44	0.58	0.712	-
		Group 2	>3	32	0.42		
		Total		76	1.00		
Auditing intellectual capital reports	35	Group 1	<-3	31	0.41	0.037	✓
		Group 2	>3	45	0.59		
		Total		76	1.00		
More competitive economic environment	36	Group 1	<-3	15	0.20	0.003	-
		Group 2	>3	61	0.80		
		Total		76	1.00		
Development of knowledge-based companies	37	Group 1	<-3	21	0.27	0.048	✓
		Group 2	>3	55	0.73		
		Total		76			
Economic structure of the country	38	Group 1	<-3	41	0.53	0.811	-
		Group 2	>3	35	0.47		
		Total		76	1.00		
Sixth Program of Economic Development	39	Group 1	<-3	40	0.52	0.712	-
		Group 2	>3	36	0.48		
		Total		76	1.00		
Prerequisites of the economic growth	40	Group 1	<-3	31	0.41	0.037	✓
		Group 2	>3	45	0.59		
		Total		76	1.00		
Measurement ambiguity	41		<-3	16	0.21	0.003	✓
			>3	60	0.79		
				76	1.00		
Measurement problems	42		<-3	17	0.21	0.003	✓
			>3	59	0.79		
				76	1.00		
Unique framework for reporting	43		<-3	19	0.27	0.048	✓
			>3	57	0.73		
				76	1.00		
Entering value judgments in reporting	44		<-3	43	0.53	0.811	-
			>3	34	0.47		
				76	1.00		
Unreliability of some information	45		<-3	44	0.58	0.712	-
			>3	32	0.42		
				76	1.00		
Senior management support	46		<-3	31	0.41	0.037	-
			>3	45	0.59		
				76			

Figure 1 after summarizing and categorizing them. Finally, in terms of the various aspects of intellectual capital reporting, extractive keywords were set up from the viewpoints of the corporate experts and academics in the form of the final themes in the final framework.

5.2 Analysis of questionnaire data

A questionnaire was designed and given to the experts to evaluate the degree of their agreement about the proposed qualitative model. After collecting and extracting the data from the completed questionnaires, the SPSS software version 19 was used to analyze them. The questionnaire consisted of 46 questions designed based on the components of the developed qualitative model (Figure 1). 76 questionnaires were completed and delivered to the researcher. Each item in the questionnaire measured the degree of the agreement of respondents about the corresponding statement based on the five-point Likert scale from the complete agreement to complete disagreement. Finally, the collected responses were quantitated as follows, and they were analyzed based on the numerical value.

Totally disagreeing=1, disagreeing=2, not commenting=3, agreeing=4, totally agreeing=5.

We first examined the reliability and validity of the questionnaire. Reliability is the stability of measures by repeating the measurement (Azkia and Darban Astaneh, 2003). Cronbach's alpha was used to assess the reliability of the questionnaire. A value of Cronbach's alpha equal to 0.781 for 46 questions of the questionnaire indicated that the questionnaire had sufficient reliability. Validity is the degree of conformity of observations and research questions with the main purpose of the research.

The Kolmogorov-Smirnov test was used to check the normality of the research variables.

H_0: Data has a normal distribution.

H_1: Data does not have a normal distribution.

Based on the results of the test at a significance level of 5% ($\alpha = 0.05$), it was found out that the distribution of none of the questions in the questionnaire was normal. Therefore, a non-parametric binomial test was performed for all the questions.

The hypotheses of the binomial test for checking the mean of the questions are as follows:

H_0: More than half of the respondents did not agree with the proposed statement ($P \leq 0.05$).

H_1: More than half of the respondents agreed with the proposed statement ($P > 0.05$).

Table 2 presents the results of the binomial test. The statement related to each question is given in a summarized form along with the related question number to facilitate the readability of the results.

6. Conclusion and Recommendations

The specific result of this study presents the reporting model of the intellectual capital in the oil industry companies, as illustrated in Figure 1. In addition to the various types of reporting, which include a mixed form of reporting, i.e. quantitative-qualitative reporting, the model provides factors and criteria for reporting intellectual capital. Moreover, the various aspects of reporting are discussed in general. Based on the interviewees' responses, the average weight of the components of the model is tabulated in the below table:

Furthermore, based on the results of the questionnaire analysis, 33% of the total answers were related to human capital criteria; also, 24% and 14% were respectively related to relational capital and structural capital; 10% and 19% were assigned to the aspects of intellectual capital reporting and the importance of intellectual capital measurement and reporting respectively.

Since the statistical population of the present study includes the managers and experts of oil companies as well as professors and experts in accounting and human resources fields and since the research method is qualitative and uses soft data (interview and questionnaire), no research similar to the current one in the field of intellectual capital reporting has been conducted to compare our results and to confirm previous internal or external findings. However, the only work done in Iran can be the work of Zahedi et al. (2013) which designed a model for measuring intellectual capital in Iranian state cultural organizations. It is necessary to explain that the majority of internal researches in Iran in this area are based on correlation and regression methods and have only examined the relationship between intellectual capital and firm performance indicators; most of them have used Pulic model (1997) for measuring intellectual capital. Furthermore, external works in the area of intellectual capital reporting have been limited to questionnaire research and content analysis as mentioned in the literature review section; however, due to the structure of the present study, we cannot compare our results with their findings.

Considering the magnitude of the oil industry in Iran having more than two thousand people with a high level of expertise in the industry and the connection of the oil industry with the different sectors of the economy,

reporting intellectual capital in this industry is of great importance. Therefore, the model of identifying and reporting intellectual capital should be designed and presented for oil companies, especially National Iranian Oil Company. The authors do not claim that the model presented is the only possible model, the only right model, or even the best possible model, but we claim that considering the current situation and the growth and expansion of intellectual assets at the level of companies, especially companies in the oil industry, we had better take a minimalistic action to capture the effects of intellectual capital in the financial statements of Iranian companies. This is important in addition to the usefulness of the users of this kind of information. Corporate executives also have the ability to manage their intellectual capital.

As pointed out in the literature review, the knowledge-based economy now plays a significant role in global economic growth and development. In recent decades, intellectual and intangible assets have replaced physical and fixed assets. In the current work, the experts also believed that the country's movement towards a knowledge-based economy, the development of knowledge-based companies, and a significant increase in competition among knowledge-based companies have increased the importance of intellectual capital more than before. Therefore, regarding the importance of intellectual capital in the oil industry companies due to the important role of knowledge therein, the issue of providing information about intellectual capital reporting has become significant at the macroeconomic level of the country's economy.

In addition, the study of the components and concepts obtained from the research process, as seen in Figure 1, as well as the examination of the codes derived from the interviews, shows that intellectual capital reporting may have some disadvantages. In this context, the difficulty in measuring intellectual capital, the low reliability of some information, the negative effects of the value judgments on the reporting process, and ambiguity in measuring some of the criteria have been mentioned by the interviewees.

Regarding the output effects of the intellectual capital reporting, based on the framework obtained, it was found out that one of the important implications of reporting intellectual capital in an organization is the application of intellectual

Table 3 - The average weight of the model components based on the interviewees' responses

Human capital		Relational capital		Instructional capital		Aspects of reporting IC		Importance of IC measurement and reporting	
Component	Weight	Component	Weight	Component	Weight	Component	Weight	Component	Weight
Technical staff	0.80	Oil customers	0.60	Highly disciplined environment	0.40	Attention to value judgment	0.60	Equal importance of intellectual and physical capital in the oil industry	0.33
Upstream section	0.73	Specific customers	0.80	Integrated laws	0.53	Senior management support	0.27	Importance of evaluating disclosure of IC information	0.40
Training and education	0.67	Customer long-term relationship	0.93	Reward system	0.47	Measurement problems	0.4	Using as a measurement tool in the oil industry	0.53
Highly skilled engineers	0.80	Vertical cooperation	0.67	Hierarchical supervision	0.60	Measurement problems	0.93	Distinguishing between the quality of IC in the oil and other industries	0.73
Downstream section	0.87	Customer royalty	0.8	Oil resources	0.87	Measurement ambiguity	0.87	The large number of skilled personnel in the oil industry	0.27
Good English knowledge	0.60	Limited number of customers' cooperation	0.87	Huge infrastructures	0.73	Unique framework for reporting	0.40	Cost-benefit consideration	0.80
Specific job requirements	0.73			Special equipment and infrastructures	0.80	Reliability of information	0.60		
Work discipline and environment	0.53								

capital reports as an important management tool. Also, most interviewees believed that intellectual capital reports should be audited.

The following topics are proposed for future research:

- Based on the results obtained herein, it is suggested that, in future research, a number of oil industry companies and users should be experimentally provided with the data modified by the present model. Then, the decisions made by the users who have modified information are compared with the decisions made by a control group who do not have this information.
- It is suggested that different groups of users of the financial statements of Iranian oil companies be studied, and their views on the impact of measuring intangible assets on the decisions they make are carefully documented and evaluated. Such information can be of great help in determining the best model for reporting intangible assets in financial reporting in oil companies.
- It is recommended that the model obtained from the current research be applied to a unique company in an exemplary manner.
- Conducting separate research in the area of quantitative variables can be reported for all companies.
- Performing a similar study on organizations and state-owned companies and comparing its results with the results of the present work.

References

Aboody, D., and B. Lev, B. (2000). The Value Relevance of Intangibles. Journal of Accounting Research. 36,pp 161-191.

Adesina, K. (2019), Bank technical, allocative and cost efficiencies in Africa: The influence of intellectual capital. The North American Journal of Economics and Finance, Vol. 48, No. 2, 419-433.

Amir. e and Lev B., (1996). Value-Relevance of Non-Financial Information: The Wireless Communication Industry'., Journal of Accounting and Economics, Vol. 22, No. 3, PP. 3-30.

Arefmanesh, Z. Rahmani, A. (2012), Measuring intellectual capital and its relationship with the cost of equity. Empirical Research in Accounting, 6, 1-17.

Bellora, L., Guenther, T.W, (2015). Drivers of innovation capital disclosure in intellectual capital statements: Evidence from Europe, The British Accounting Review, 15(2), pp 5-42.

Bontis, N. (2002). Intellectual capital disclosure in Canadian corporations, Journal of Human Resource Costing & Accounting, Vol. No. 3, pp. 9-20.

Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3 (2). pp. 77-101.

Capello, R. & Faggian, A (2005). Collective Learning and Relational Capital in Local Innovation Processes, Regional Studies, 39:1, pp 75-87.

Chaminade, C., and H. Roberts. (2003). What It Means Is What It Does: A Comparative Analysis of implementing Intellectual Capital in Norway and Spain. European Accounting Review12, 4, pp 74-93.

Chareonsuk Chaican, Chansan-nhavej Chuvej. (2008). Intangible asset management framework for long term financial performance, Industrial Management & data Systems, 108 (6), pp 812-828.

Chia, C and Chien, K,. (2019). The major determinants of influencing the operating performance from the perspective of intellectual capital: Evidence on CPA industry, Asia Pacific Management Review, Volume 24, Issue 2, 124-139.

Guthrie, J. and Petty, R. (2000). Intellectual capital: Australian annual reporting practices, Journal of Intellectual Capital, Vol. 1 No. 3, pp. 241-51.

Hafeznia, M. (2006), An introduction to research method in human sciences. SAMT Publications. Twelfth Edition.

Jabbarzadeh-Kangarlouei, S. Bashiri, A. (2014), Comparing the explanatory power of economic value-added and intellectual capital in determining the market price. Financial Accounting and Auditing Researches, 6 (21), 103-120.

Kianto, A., Ritala, P., Vanhala, M and Hussinki, H. (2018), Reflections on the criteria for the sound measurement of intellectual capital: A knowledge-based perspective, Critical Perspectives on accounting, 60(1), 1-15.

Ola, M. Hajizadeh, H. Saeidi, M. (2016), The relationship between intellectual capital and productivity in pharmaceutical companies. Financial Accounting and Auditing Researches, 8, 91-73.

Shuai, C., & Wang, D.-X. (2010). High Performance Work Systems and Organizational Innovative Capabilities in the PRC: The Mediating Role of Intellectual Capital. Technology Management for Global Economic Growth, pp. 1-9.

Yu, A, Lorenzo, L & Kourti, I. (2017). The role of Intellectual Capital Reporting (ICR) in organizational transformation: A discursive practice perspective, Critical Perspectives on Accounting, 41(5), pp.1-15.