The Impact of Data Quality on Access to Strategic Objectives Case Study: Iranian Large Universities

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Abstract: In this study, the relationship between data quality with success in organizational strategies were studied in the large universities. The main variables are data quality, large university's KPIs and access to organizational strategies. Each variable has sub-variables that extracted from literature review. The population of this research contains all people who work in the university who has enough information and experience in the data and in the organizational goals that the numbers of them are 41 people. Data analysis was performed using regression techniques. Hypothesis testing was performed using the software SPSS. The results show that there is a significant relationship between data quality and KPI in large universities. Also, there is a significant relationship between KPIs and access to strategic objectives. But the relationship between data quality and access to strategic objectives cannot be considered significant. The results show that there is non-linear relationship between data quality and access to strategic objectives.

INTRODUCTION

Nowadays, pile of information is accessible and those who can make use of this information more effectively are more successful in spite of the past decades those who could accumulate more information than others were more successful. In some cases the bulk of information is so excessive that the organization would be confronted with data chock, furthermore the organization would be in need of refining and justifiability of the information because of the enormous amount of misleading and false information. Entering to the age of information and explosion of information has resulted in saturation of data and information in organizations. In big organizations such as a large university, top managers by analyzing the inner and the environmental situation of the organization, codify the best way of successfulness strategically and perform it by spending too much time and money. To that end, refining the performance and conducting the organization's strategy is of paramount importance. The organization's data is critical in refining the strategy. Therefore, data quality plays a crucial role in the life of organizations. In a large university with a codified and performed strategy which is trying to refine the information through codifying Performance Index (PI) and Key Performance Index (KPI), lack of data, low quality of the existing data and lack of expertness in use of this data will endanger the strategy refining in terms of some perspectives.

Table 1: The academics view of Information Quality (IQ)[1]

Researchers	Intrinsic IQ	Contextual IQ	Representational IQ	Accessability IQ
Wang and Strong[2]	Accuracy, believability, reputation, objectivity	Value-added, relevance, completeness, timeliness, appropriate amount	Understandability, interpretability, concise representation, consistant representation	Accessability, case of operations, security
Zmud[3]	Accurate, factual	Quantity, reliable/timely	Arrangement, readable, reasonable	
Jarke et al.[4]	Believability, accuracy, credibility, consistancy, completeness	Relevance, usage, timeliness, source currency data warehouse currency non-volatility	Interpretability, syntax, version control, semantics aliases, origin	Accessability, system availability, transaction availability, privileges
Delone and McLean	Accuracy, precision, reliability, freedom from, bias	Importance, relevance, usefulness, informativeness content, sufficiency, completeness, currency timeliness	Understandability, readability, clarity, format appearance, conciseness, uniqueness, comparability	Usableness, quantitativeness, convenience of access[a]
Goodhue	Accuracy, precision,	Currency, level of detail	Compatibility, meaning, presentation, lack of confusion	Accessibility, assistance case of use (of h/w, s/w) locatability
Ballou and Pazer[5]	Accuracy, consistency	Completeness, timeliness		
Wand and Wang[6]	Correctness, unambiguous	Completeness	Meaningfulness	

[a]Classified as system quality rather than information quality by Delone and McLean

In this research by looking at indexes and models of organizational strategy refining as well as frameworks of data quality and its factors, there will be a try to present the effects of data quality on models of organizational strategy refining. In the case study by choosing one models of Iranian large university's organizational strategy refining, the effects of increasing data quality on performance of the model will be presented in large universities of Iran.

Literature review: Data Quality (DQ) problems are widespread in practice and have significant economic and social impacts[2]. For every hour the 'business spends hunting for missing data, correcting inaccurate data, working around data problems, scrambling to assemble information across disintegrated databases, resolving data-related customer complaints' and so on, the hourly costs are passed on to the customer through higher prices[7]. Monitoring data quality also helps to improve data analysis and interpretation in public health reports at all levels[8]. A proposal to improve data comparability at the EU level in line with the objectives of the organization long-term surveillance strategy was presented to the organization Advisory Forum on 2011[9].

In Table 1, different dimensions of data quality based on university research can be seen. The first row has been proposed based on an empirical method and by gathering data from IT users. Wang and Strong[2] has determined the dimensions which are more important in their opinion. The next three rows have been presented based on the literature. The last two rows have been presented based on the evident dimensions which can be seen[5]. In general, it can be said that the accuracy, consistency, completeness, timeliness are the dimensions which have emerged in different studies and researches regarding data quality[3, 4, 6].

The importance of tables for different aspects of information quality and description of each of them. Since, in our research, data quality is one of the main variables, hence, to explain this macro variable, the sub-variables were needed to express all aspects of it. Using this table, variables that co-expression of all aspects of the quality of information was selected and were considered as the sub-areas of data quality. In other words, using this table, the classification for the sub-variables of data quality were identified.

Intrinsic IQ implies that information has quality in its own right. In the case of a University, Intrinsic IQ means that the information is correct at the University. Since, accurate information is the base of planning and decision-making in any organization, including at university, therefore, this aspect of IQ is important at the university.

Contextual IQ highlights the requirement that IQ must be considered within the context of the task at hand; it must be relevant, timely, complete and appropriate in terms of amount, so as to add value. Representational and accessibility IQ emphasize the importance of computer systems that store and provide access to information; that is, the system must present information in such a way that it is interpretable, easy to understand, easy to manipulate, and is represented concisely and consistently; also, the system must be accessible but secure. Since, the university is a place of knowledge production, then, this aspect of IQ can help the University to perform education and research efficiently.

Representational IQ is clarity of definition, precision of domains, naturalness, homogeneity, identifiability, minimum unnecessary redundancy, semantic consistency, structural consistency, appropriate representation, interpretability, portability, format precision, format flexibility, ability to represent null values, efficient use of

storage, representation consistency. In the case of a university, representational IQ means that the scientific/ official data storage must be at standard formats. Otherwise, the use of information by students or faculty members are not productive and productivity of universities in the fields of education and research would be jeopardized.

Accessibility IQ implies that this information is easily retrievable, is easily accessible is easily obtainable and is quickly accessible when needed. In the case of a university accessibility IQ means that those who need specific information to teach, study or research have access to the necessary information to resolve their needs (not less not more). As this aspect of the IQ, this will also can help the University to observing safety tips, satisfaction and speed of the processes.

The aim of this study at the university is to Increase the efficiency in two ways: increasing the IQ of the information used in planning would more accurately identify the strengths and weaknesses and it leads to planning better of future goals. It also, makes precisely and quickly the monitoring of the achievement of defined objectives, during the execution of the processes (The impact of IQ in logistics of university). In educational and research activities, the more IQ leads to qualitative graduated students and leads to more articles with higher quality (The impact of IQ in product-line of university).

Each system provides important information about a particular aspect of the organization's performance but each collects, defines and displays the information in a different way. Due to the lack of enforced integrity and relationship, disparate data is usually of low quality as compared to data which has been properly integrated. Disparate data creates confusion and inefficiencies and blurs accountability. KPIs based on this data are often incomplete, conflicting, or limited to a particular department/function within the organization. Sometimes they are all three[10].

A literature search indicates that very little previous research has addressed the problem of data quality and its impact on KPIs. However, in practice, the data quality dimension has been addressed in several performance management frameworks[11, 12]. For example, the performance-based management framework[11] are considered data quality dimension in the step of collecting and analyzing data. The AIS AHEAD programme has also tried to come up with data quality KPIs. Hey proposed the data quality initiative framework that begins with determine data priority from organizational KPIs. However, knowledge of the link between data quality initiatives and organizational KPIs is still unclear at this time. That is there is a perceived need to explore the ways in which data may be generated and stored and also to examine ways of improving DQ, so that, KPIs better address the goals established for them.

Masayna *et al*.[13] has presented a framework for the connection between KPI and DQ. The preliminary model for criteria to establish the links between DQ initiatives and organizational KPIs is such as Fig. 1.

The CobiT framework defines KPIs as measures that determine how well business processes are performing in terms of their potential to enable a particular goal to be reached. They are lead indicators of whether a goal is likely to be reached or not and are good indicators of capabilities, practices and skills. They measure the activity goals which are the actions the process owner must take to achieve effective process performance. KPIs are focused either on the critical aspects of organizational performance that require improvement, or on the aspects that must be kept within a specified level to ensure the continued success of the organization[14, 15].

These aspects usually include customer satisfaction, financial, process and human factors. In a complex and challenging economy, companies need forward-looking or "leading" metrics that are tied to the company's value drivers. Leading metrics (for example, customer
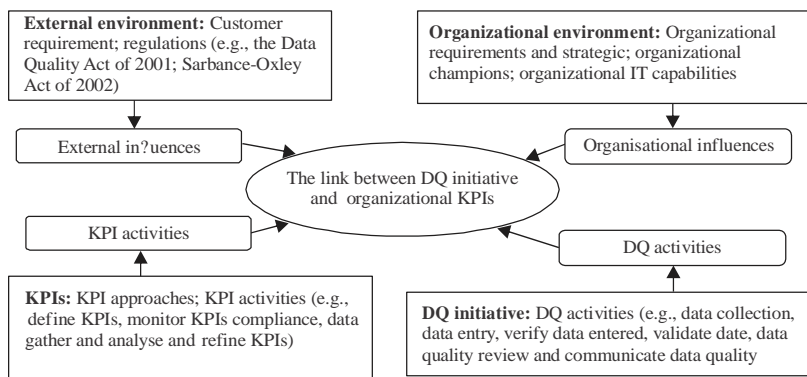

Fig. 1: Links between DQ initiatives and organizational KPIs

satisfaction), based on cause-and-effect relationships, can alert companies to problems before they adversely affect the bottom line[10]. For example, declining customer satisfaction can point to an eventual drop in overall revenue or a loss of market share.

Neely and Bourne[16] points out that 70% of balanced scorecard implementation fail. The author goes on to argue that there two main reasons why measurement initiatives fail. The first is that measurement systems are often poorly designed. The second is that they are difficult to implement due perhaps to (politics, infrastructural issues, and loss of focus). KPI implementations can also suffer from the same issues. The KPI literature suggests that successful performance measurement depends on how well these KPIs are designed[17, 12, 18]. Organization's efficiency and effectiveness are two of the most important determinants of business success[19-21]. Thus, performance measurement becomes a critical business activity. Performance measurement often requires a reactive component capable of monitoring time critical operational processes to allow decision-makers to focus their actions according to the organization's strategy[22]. This component is usually supported by a computer-based information system.

The business objective is a high-level goal that is quantifiable, measurable and results oriented. Data processing is often regarded as one critical element in KPI evaluation[23]. Organizations must be able to identify the DQ elements which are necessary to support the KPIs. However, in practice, organizations may be unable to identify high-value, high-risk data quality dimensions that support each KPI.

MATERIALS AND METHODS

The purpose of this study is to examine the relationship between data quality and the organizational strategies monitoring. There are other variables as KPIs or CSFs that play an intermediary role between the main variables. So, the main variables in this study include the DQ and KPI and monitoring university strategies. To measure the overall/macro variables, it is necessary to transform them into micro/detailed variables that they are more easily being measurable and understandable. Then each of these measurable variables can be measured and using usual method, they can be integrated which is equal to related macro variable. In this section of research, researcher plans to autopsy main variables. Using literature review, it is done as follows:

In order to identify the variables associated with DQ, models introduced by Marshall and Harpe[24], Kerr et al. [25], Barnabe and Riccaboni[26], English[27], Loshin[28] and Shankaranarayanan[29] were evaluated and important variables were extracted from each study. Then, duplicate variables removed and variables that had a lot of overlap conceptually, merged. The result of this work is to achieve the variables that summarized in Table 2.

In order to configuration of sub-variables related to KPIs that used for evaluation of university performance, models introduced by Adriana et al. Broadbent, CUC (Committee of University Chairmen) report on the monitoring of institutional performance and the use of KPI's Cave etc., Chen etc., Heller, Terenzini and Pascarella were evaluated and important variables were extracted from each study. Then, similar to previous

Table 2: The main variables extracted in the area DQ

Research Factor of DQ	Shankarana[29]	Loshin[28]	English[27]	Barnabe and Riccaboni[26]	Kerr et al. [25]	Marshall and Harpe[24]
Available		*	*			*
Up-to-date	*	*	*			*
Complete						*
Accurate		*	*	*	*	*
Continuity		*		*		
Necessary			*			
Representative		*				
Relevant	*	*		*	*	
Usable		*			*	
Secure		*	*	*	*	
Timely (Focusing on time horizon)		*	*		*	
Comparative		*			*	
Consistent		*				
Much data	*	*	*	*		
Impacting data		*	*	*		
Valid metadata	*	*		*		
Linkage between measures and strategies				*		
Measures driven to all organizational levels		*		*		
Not too many measures				*		
Enough critical measures				*		
Conflicting measures	*	*		*		

Table 3: The main variables extracted in the area KPIs of university

Research KPI	Pascarella and Terenzini	Heller	Chen etc.,	Cave etc.,	CUC report	Broadbent	Adriana	Area
Researcher FTE	*		*		*	*		Research
Number of sponsors	*	*	*				*	
Granted applications	*			*		*		
Number of publications	*			*	*	*		
Number of doctorate conferred	*				*			
Exploitation of Intellectual Property (IP)	*	*			*			
Number of successful entrepreneurs	*	*						
Citations	*		*		*	*		
Memberships	*	*	*					
Awards	*		*				*	
Research ranking	*				*			
Intake of graduates and undergraduates		*		*	*	*		Educational
Number of BA/MA degree programs		*		*	*	*		
Staff FTE			*					
Student/ academic staff ratio			*		*			
Graduation				*	*	*		
Student satisfaction			*			*	*	Process
Study efficiency					*	*		
Retention rate			*		*		*	
Drop-out rate		*	*				*	
Average contact hours			*				*	
Graduation satisfaction				*		*		
Employment			*	*			*	
Research income	*	*			*			Financial
Research indirect cost recovery	*	*			*	*		
Share in funding (3rd party or governmental)	*	*			*			
Tuition fees and other services			*	*	*	*		
Short/long-term financial position						*		
Operating cost recovery			*		*		*	
Surplus/deficit as % of income					*	*		
Current ratio						*		
Debit ratio			*				*	
Manager's satisfaction toward financial strategies						*		
Annual amount of investment in infrastructures		*			*	*		
Expenditures on training and development					*	*		
Percentage of Success in recruitment		*				*		Human capital
Staff skills and staff diversity					*			
Employee's age distribution					*			
Employee motivation					*			

section, duplicate variables removed and variables that had a lot of overlap conceptually, merged. In each of these studies, university performance indicators is provided and they were classified. So that, they can be expressed in five main categories. In other hand, the Ministry of Science and Technology in Iran have an instructions to performance assessment of major universities, that it has same category to do assessment. The result of this work is to achieve the variables that summarized in Table 3.

Finally, in order to ensure about the connections between IQ and university's KPIs, the studies that have been conducted in the field of communication, were evaluated. In other words, in one study, if there was a relation between each of variables in the field of DQ and each of variables in the field of university's KPIs, then, the relation was extracted and was placed in a list. Afterward, the aforementioned variables, nature of communications between variables and references, were summarized in a table that can be seen in Table 4.

For example, in the first row fourth column, the relationship between variables "Financial" and "Available" that belong to DQ and KPI variables are shown that the same is confidentiality. This means that financial data are available but there are security considerations when using them.

Conceptual model of research: Using Table 4 can be seen that the relationship between DQ and some KPIs was stated. These relationships were examined by researcher and it was found that KPI in two stages can be influenced by data quality that are: when defining KPIs and while measuring KPIs. Also referring to the literature of strategic areas, it became clear that to measure the strategic objectives of each organization, KPIs should be used productively. When A KPI is productive which is effective and efficient. Effective means that they are properly defined and efficient also means that they are properly measured. So, in the construction of the conceptual model, DQ variable impact on the KPI in two

Table 4: Relations between DQ and university's KPIs

KPI/DQ	Variable's code	Human capital KPI1	Financial KPI2	Process KPI3	Educational KPI4	Research KPI5
Available	DQ1	Data are transportable[24]	Data are secret			Transportable data[24]
Up-to-date	DQ2		Data are variable		Data are variable	Data are variable
Complete	DQ3		Necessary[28]		Inevitable[24]	
Accurate	DQ4	Improve the quality of decisions[25]	The sensitivity of statistics	Qualitative processes[24]	Can be used for administrative purposes[25]	
Continuity	DQ5			Feasibility of reviewing process		Inevitable because of the nature of some indices
Necessary	DQ6		Much diversity			
Representative	DQ7	Statistics have nature of sample				Alignment with Goals
Consistent	DQ8		Ensure the accuracy of reports[28]	Validity of data		
Much data	DQ9	People are different		Sectors are different naturally		Long period of monitoring data[28]
Impacting data	DQ10	Fore-measuring the indicators[13]		Ease of calculation[13]	The impact on the main objectives	
Valid metadata	DQ11		Ability to document	Correct judgments		
Linkage between measures and strategies	DQ12	Quantifiable[13]	Not loss of the organization's mission	In the direction of the strategy cascading	Giving meaning to methods[13]	
Measures driven to all organizational levels	DQ13	The difference in the level of availability of poeple		Hierarchy of many processes	Different hardness for different levels of education	The difference in capability in levels of masters
Not too many measures	DQ14		Index limitations	Making assessments balanced		
Enough critical measures	DQ15	The importance of empowerment				Inadequacy of some of the indicators
Focusing only on the time horizon	DQ16		Variable conditions	Difference between monitoring courses	Can be used for administrative purposes[25]	Different uses of indicators
Conflicting measures	DQ17	Misalignment of some indicators	Misalignment of some indicators		Balancing the conflicting goals	Misalignment of some indicators

separate parts as mentioned before is considered. On the other hand, given the number expressing DQ variables are shown in Table 1 is 21 variables that are different entities; there is a need to categorize them. To do this, we refer to the literature related to DQ and classifications that introduced by different researchers were observed. The use of expert opinion as well as reforms that were carried out by the researcher, these variables were classified into 4 groups as follows:

- Accuracy
- Completeness
- Consistency
- Timelines

Using the above analyzes relations within micro and macro variables were identified. Using the experts' opinion, this relationship was just a figure that is presented in the following:

As can be seen in Fig. 2, to express the relationship between the main variables can be sure that the connections between each of the sub-variables to be considered. Because at this stage it is not clear which of these connections do exist and, if so, how much is each strength and weakness, so for any communication, developed a hypothesis which will be examined in the next section.

So, to prove the existence or non-existence of a relationship between variables, using the main research question (chapter 1) and research model that has been formed on the basis of the literature, The following Hypothesis were considered for this study:

There is a significant relation between DQ and achievement to objectives that have been defined in organizational strategies, in the Iranian big universities.

There is a significant relation between DQ and KPIs that have been defined in the Iranian big universities for performance assessment.

There is a significant relation between KPIs (Defining and measuring) and achievement to objectives that have been defined in organizational strategies in the Iranian big universities.

Data collection tool (questionnaire): It is necessary to measure the conceptual model to each variable and the following variables be measured. Since, most relevant information in the databases of organizations do not exist or are not well known about the quantity and quality of information, or Information are exist but they are not available to researchers, Therefore, in many cases to collect data, the use of questionnaire is necessary. In this study, a questionnaire was used to collect the required data. The questionnaire consists of three main sections as follows:
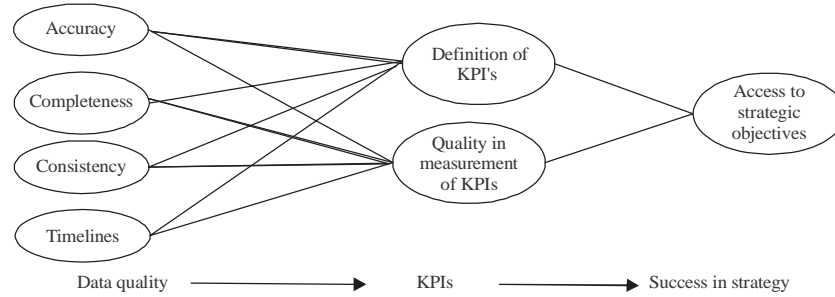
Fig. 2: Conceptual model of research

The first part of the questionnaire includes measurement of DQ and its related sub-variables. To do this, for each of the variables 21's, according to the case study (university) the question(s) designed and has given to members of sample. Because these variables are qualitative, therefore Likert scale is used to express the amount of each one. In addition, since the person cannot evaluate in his mind the exact amount of each variable, Therefore evaluation of the spectrum Likert 5-point range was selected.

The second part is measuring KPIs. The number of KPIs based on Table 2 is up to 39 numbers that have been classified in five categories. Based on conceptual model for each of these variables, two questions arise that are; the extent to which variables properly defined? And to what extent the variables to be measured correctly?

In the third section of the questionnaire, the monitoring and supervision of the progress of the strategic objectives of the organization will be evaluated. To do this, among the strategic objectives of the organization (in which in this research organization is the university), using the view of professors and experts, the most important of these goals were selected. Their number of them is 11 the strategic objectives include as below:

- Strengthening of university autonomy
- Promoting regional and international situation of university
- Developing the authority of University's managers
- Development of cyberspace
- Educating the Multidimensional human and strengthen body and soul with science
- Development of new courses and new fields of scientific in Current courses
- Adapting the training to real needs of the country
- Development and expansion research activities of faculty
- Improving the ability and the spirit of innovation and entrepreneurship
- Commercialization and application of research results and technology of university
- Improve the quality of living and fix problems at work of all employees

Then, to measure the extent to which each aim has been to measure and monitor, question(s) is designed. In this study, Cronbach test was used to assess reliability. To do this, questionnaire was given to 10 members of population and was completed by them. Then, for each of the three parts contained in any questionnaire, Cronbach's alpha was calculated separately and in the end, Cronbach's alpha was calculated for the entire questionnaire. Cronbach's alpha values for parts of the first, second and third are 0.791, 0.848 and 0.925, respectively and the overall Cronbach's alpha is 0.885. Since, all these amount are >0.7, this indicates that reliability is acceptable. In addition, since, all variables are extracted from the studies conducted on the same field and research model is completely dependent on the literature, then, the validity of questionnaire (which is based on the conceptual model is designed) is acceptable.

Statistical population and sampling: The population of this research contains all people who work in the university who has enough information and experience in the data and in the organizational goals. The initial investigation showed that the number of middle managers and senior (or those who have long been director) are eligible population and the number of them are 41 people. Because the job is a researcher is at the university and she has 12 years-experience in the information sector of university, then Access to all the population is possible for her. So, in this study census method can be used instead of sampling. It is necessary to mention that Tehran University is the largest university in Iran. Most of the People who work in this university, have started in the other universities and by increasing the knowledge and experience have been transferred to this university. So, The 41 experts who were selected, those who have had experience working in all major Iranian universities. Then, the findings of this study can be based on the facts there's at all major universities. It should be noted that No foreign people working in key parts of this university. Thus, an expert cannot be found out the above explanation.

Table 5: Tests of normality

	Kolmogrov-Smirnov		
Variables	Statistic	df	Sig.
Accuracy	0.136	40	0.010
Completeness	0.737	40	0.048
Consistency	0.429	40	0.036
Timelines	0.027	40	0.001
Definition of KPIs	0.246	40	0.024
Measurement of KPIs	0.053	40	0.005
Access to Strategic objectives	0.443	40	0.038

Data analysis: In order to determine the relationship between variables, we will use correlation coefficient. The correlation coefficient may be used in 2 ways: one for quantitative data called Pearson coefficient and another qualitative data called coefficient of Spearman. Obviously the Pearson correlation coefficient has the higher accuracy. The interesting thing about this is that if qualitative data have a normal distribution, the correlation between them can be calculate the correlated by Pearson's correlation coefficient. So, in this section before perform the main calculations, it is necessary to check the data distribution normality for each of variables. One of the most popular statistical tests for this work is the Kolmogorov-Smirnov test. Hypothesis related to this test are as follows:

- H_0: Distribution is not normal
- H_1: Distribution is normal

No statistical hypothesis cannot be accepted or rejected with 100% of confidence. So, often these tests performed with confidence that make decision-makers compelled. In this study, 95% of confidence value is considered. The results of normality test on the main variables are presented in Table 5.

As can be seen, the significant for all variables is <0.05. It means that H_0 can be rejected with 95% of confidence and as a result, it can be assumed normal distribution of data.

In the following, according to normal distribution of all distributions of data, Pearson correlation coefficient calculations used for testing the relationship between the main variables. In these calculations, the correlation coefficient test calculated and its reliability is assessed too. It means that if there is a non-linear relationship between variables (although it may be a high numerically), it has no reliability. Hypothesis related to the following test are:

- H_0: r = 0
- H_1: r#0

Judging by the outcome of this test will be performed at 95% of confidence. The results of the correlation coefficient calculation and related tests are shown in Table 6.

As can be seen, the correlation coefficient between the main variables is positive. Also, by rejecting all the H_{0s}, It can be seen that the linearity of the relationship between variables is confirmed. In some cases the correlation coefficient is very small and ignorable.

There is another statistic called the coefficient of determination that it shows the majority of changes in variables that are associated with another variable. Therefore, the coefficient of determination shows influence of variables on each other in a better way states. A numerical value of this statistic is equal to the square of the correlation coefficient. For all relations between variables, coefficient of determination was calculated and the result illustrated in Table 7.

As can be seen in many cases the coefficient of determination is very small and can be ignored. In other cases it is accepted that there is a relation between main variables. The numbers of these items are shown in bold. For example the number 0.537 in the first row 6th column shows that when the variable Accuracy changes (the change can be affected by various factors), at the same time variable "Definition of KPIs" changes too but 0.537 of these changes are simultaneous and 0.463 of them affected by other variables.

The hypothesis are formulated as:
- H_a: Data quality can effect on KPI (definition and measurement) in Iranian large universities
- H_b: The (definition and measurement of) KPI effects on monitoring of organizational strategy in Iranian large universities. The research hypothesis are illustrated in the following Fig. 3

Table 6, presented the Pearson correlation test results with testing hypotheses related to each of the correlation coefficients. For example, the relationship between accuracy (as one of the sub-variables of data quality) with the definition of KPIs (as one of the sub-variables of KPI)is calculated equal to 0.733. This number showed a strong relationship between the variables. Also, significant is 0.004 that cause to rejection the hypothesis that states non-linear relationship between variables. According to these numbers, it can be accepted that there is a significant relationship between accuracy and definition of KPIs in the big universities of Iran. According to the figure above, this means that Ha1 be accepted. In case of any of $H_{a(s)}$ and $H_{b(s)}$, the same analysis can be done. The result of all these analyzes are presented in the following Table 8.

As can be seen, all the assumptions related to H_a and H_b are accepted. Then it can be said that these assumptions were reasonable. In other words, data quality has a significant relationship with KPI and KPI also has a significant relationship with Access to strategic objectives. But the main Hypothesis (H) cannot be stated

Table 6: Correlations

Variables	Accuracy	Completeness	Consistency	Timeliness	Definition of KPIs	Measurement of KPIs	Access to strategic objectives
Accuracy							
Pearson correlation	1.000	0.038	0.208	0.419	0.733	0.859	0.273
Sig. (2-tailed)		0.003	0.007	0.012	0.004	0.041	0.017
N	41	41	41	41	41	41	41
Completeness							
Pearson correlation	0.038	1.000	0.157	0.334	0.757	0.702	0.268
Sig. (2-tailed)	0.003		0.014	0.020	0.005	0.005	0.017
N	41	41	41	41	41	41	41
Consistency							
Pearson correlation	0.208	0.157	1.000	0.086	0.908	0.941	0.430
Sig. (2-tailed)	0.007	0.014		0.037	0.017	0.037	0.030
N	41	41	41	41	41	41	41
Timelines							
Pearson correlation	0.419	0.334	0.086	1.000	0.637	0.626	0.432
Sig.(2-tailed)	0.012	0.020	0.037		0.048	0.003	0.002
N	41	41	41	41	41	41	41
Definition of KPIs							
Pearson correlation	0.733	0.757	0.908	0.637	1.000	0.336	0.714
Sig. (2-tailed)	0.004	0.005	0.017	0.048		0.024	0.013
N	41	41	41	41	41	41	41
Measurement of KPIs							
Pearson correlation	0.859	0.702	0.941	0.626	0.336	1.000	0.772
Sig. (2-tailed)	0.041	0.005	0.037	0.003	0.024		0.032
N	41	41	41	41	41	41	41
Access to strategic objectives							
Pearson correlation	0.273	0.268	0.430	0.432	0.714	0.772	1.000
Sig. (2-tailed)	0.017	0.017	0.030	0.002	0.013	0.032	
N	41	41	41	41	41	41	41

Table 7: Coefficient of determination

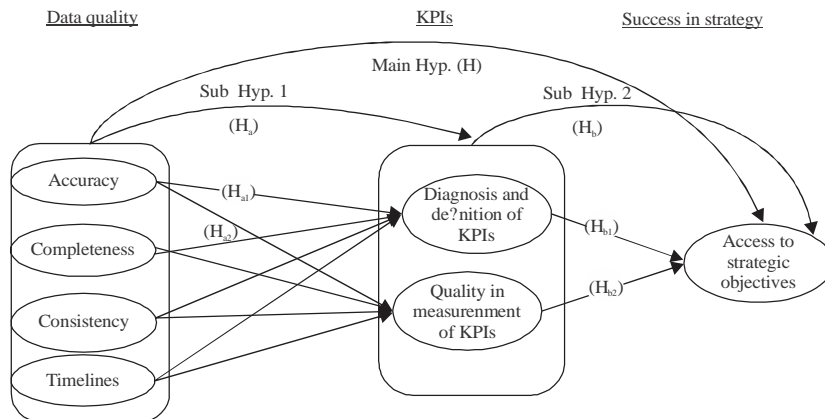| Variables	Accuracy	Completeness	Consistency	Timelines	Definition of KPIs	Measurement of KPIs	Access to strategic objectives
Accuracy	1.000	0.001	0.043	0.167	0.537	0.738	0.075
Completeness	0.001	1.000	0.025	0.112	0.573	0.493	0.072
Consistency	0.043	0.025	1.000	0.007	0.824	0.884	0.185
Timelines	0.167	0.112	0.007	1.000	0.406	0.392	0.187
Definition of KPIs	0.537	0.573	0.824	0.406	1.000	0.113	0.510
Measurement of KPIs	0.738	0.493	0.884	0.392	0.113	1.000	0.596
Access to strategic objectives	0.075	0.072	0.185	0.187	0.510	0.596	1.000

Fig. 3: Research hypothesis diagram

with certainty. The reason for this is that accuracy and completeness were not significantly associated with Access to strategic objectives. Although, consistency and timelines variables significantly related with the Access to strategic objectives but consistent conclusions about the variable "data quality" cannot be provided. Therefore, the

Table 8: The results of test hypothesis

Decision about sub-hypothesis	Definition of KPIs	Measurement of KPIs	Access to strategic objectives
Accuracy	Accepted (H_{a1})	Accepted (H_{a2})	Rejected (H_1)
Completeness	Accepted (H_{a3})	Accepted (H_{a4})	Rejected (H_2)
Consistency	Accepted (H_{a5})	Accepted (H_{a6})	Accepted (H_3)
Timelines	Accepted (H_{a7})	Accepted (H_{a8})	Accepted (H_4)
Definition of KPIs	-	-	Accepted (H_{b1})
Measurement of KPIs	-	-	Accepted (H_{b2})

main hypothesis cannot certainly gave a concrete answer. The results show that although there is significant relationship between data quality and access to strategic objectives but there are not a direct relationship between these variables. Instead, it is high meaningful relationship between data quality and organization KPI and the relation between Access to strategic objectives and KPI is also strong. So, it follows that data quality may be non-linear effect on Access to strategic objectives.

In addition, the relationship between each pair of variables were calculated in Table 6. This table shows that all relationships, whether strong or weak, are meaningful (sig <0.05). This show that there is a relationship between all of the variables and there is auto-regression between sub-variables for each of main variables. This means that the variables are linearly related to each other in a specified range and after that, the intensity and (or) direction of the relationship will change. In these cases, it is recommended to change the variables to the extent that the maximum impact on the target variable which more than that is a waste of resources.

RESULTS ANS DISCUSSION

The results show that there is not a direct connection between DQ and achievement of strategic objectives in major universities in Iran (Or at least that exists but is non-linearly). This result is consistent with Morbey but it is not compatible with Samitsch. Morbey said that DQ can make senior managers more intelligent and it can Helps the organization achieve its goals successfully, but just if; the relationship between DQ expert and board member is fully established and continuous and the share of other variables in the success of the organization also considered. In the other words, DQ for the success of any organization is necessary but not sufficient. According to Samitsch, DQ has a direct impact on decisions that they have significant impact on organizational success, therefore, there is a significant relationship between them.

The study was developed 39 indicators to assess the performance of major Iranian universities. This result is consistent with Adriana etc. However, differences can be seen in categorizations. Since, the current classification is based on the categories considerations and rules communicated by Iranian Ministry of Science and it is based on the methods that are used in Iranian universities,

therefore, this category does not fully compatible with the above-mentioned categories. For example, in the category CUC Report there is further emphasize on Educational fields and Process is not considered. Also Adriana mentioned the areas of customer, process, growth and the financial. Categories that are provided by Broadbent and chen have given less attention to aspect of the research and this areas is not considered as a main area of performance. Instead, a strong emphasis on process and have placed more weight to this area. Research of Cave and Terenzini emphasis on financial aspects and education and there is no fields for Human capital and research.

The results of this research in the field of relationship between the achievement of strategic objectives and KPIs, are consistent with Brewer and Selden, Bird etc.., Barrick, Carmona and Sieh. In all these researches the relationship between KPI and the organizational success in achieving organizational goals can be seen. In addition, in the present study KPI definition and KPI measurement were evaluated separately. In none of the above study, except for Bird etc., in such a case is not mentioned.

CONCLUSION

Research's side product: In addition, to answering the research questions that were mentioned in previous matters, this research achieved to a side product, too. There is a comprehensive-native model that can measure Performance of major universities in Iran. This model does this work by using 39 KPIs in 5 categories contains of human capital, financial, process, educational and research.

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