



The eminent effect of the business intelligence on the inner business processes and the role of the culture of the analytic decision making related (the subject of the study: Asia insurance of Zanjan province)

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Abstract. In the competitive world of today, the positive effect of the data presented by the business intelligence systems in the organizational decision making cannot be denied. Although the success of the business intelligence systems has been studied well, our understanding towards the state of the relations among the business intelligence system aspects and their method of effectiveness is restricted. The objective of this study is the surveying of the intra relation of the business intelligence systems along with the data quality, data accessibility and the data usage, and also specifying the role of the analytic decision making as the variance balancing of the relations. The results of the data analysis related to 109 personnel and the Asia insurance companies in Zanjan by the structural equation shows that the business intelligence systems can have a strong effect on the quality of the data content, the accessibility to the data and the data usage, whereas the culture of analytic decision making does not have any meaningful effect on the relationship.

Keywords: The business intelligence, data quality, data usage, the culture of the analytic decision making, success model.

1. INTRODUCTION

Along with the rise of comparative environments and the constant changes, the existence of systems able to provide the high amount of data concisely and on- time, seems important. The business intelligence is a collection of systems able to gather the different and scattered data and to provide the better decision making of the managers by the methods of analytic and multi-dimensional on-line records. Along with the making of the new chances, the business intelligence can also differentiate the business conditions by the money and time saving and as the result, it can help the organizational managers for a suitable decision making. The business intelligence can be regarded to the different computer and data conversion processes and then to the knowledge, which finally can be used for the organizational decision making (Williams, 2007 as cited in Ales popovic, 2012). It has been tried to make a comprehensive understanding of the existed relations between the successful aspects of business intelligence systems such as the content quality, data accessibility quality and the data use in the business processors and the culture of analytic decision making by the focus on the effective variants in the business intelligence. It is hopeful that this article can give a better understanding of key elements of the success by the specification of the mutual relations between the specific aspects and to get the attention of the Asia insurance managers more than before.

1.1. Research objectives

To survey and specify the eminence effect of business intelligence on the quality of the information content and also the quality of access and the use of information and the recognition of the role of analytic decision making in this regard.

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1.2. Research Questions

Does the eminence of the business intelligence affect the quality of the information content and the quality of the quality of access and the use of information? And does the analytic culture of decision making can balance the efficacy in this organization?

1.3. Review of the literature

The word “business intelligence” was for the first time used in IBM Company and it was under the attention as a communicative tool for a business which can guide the realities towards the realization of the objectives along with the mutual understanding of the realities. In 1971 at MTI university, it was suggested that the information management system attributed for the structural decision making and for the rest of the decisions (semi- structural or non-structural) the (DSS) decision support system is used. In 1989 Gartner research group presented the business intelligence as a supportive umbrella term to improve the business unit decision making based on the realities, which became a public term at the end of the 90s. Business intelligence consisting of a set of analytic and practical programs to take the advantageous decisions along with the management activities by the help of operating and analytic data bases (Williams, 2003).

Information quality: the information quality concept consisting of data quality indexes, data relations and data accessible features. If the organizations desire to have the qualified data in order to help their success, they should apply it towards the business processes of decision improvement, process performance or at least for the recognition of the consumer (Popovič et al, 2009).

Access to the data: the quality of data accessing is related to the data span, order making and reaction capability. Although technology affect the quality of data accessing, and has less effect on the data content quality, it is believed that by the better reaction of the personnel, content quality is accessible (P.S.Coelho et al,2009 as cited in Popovič,2012).

The use of the data provided by the business intelligence systems in the business processes: the use of the data can be defined as the data utilization in the organizational decision making. According to the various researches on the different aspects of data utilization such as the motivation and the intensity of the utilization on the decision making data bases, it is not surprising to use the data provided by the business intelligence system as one of the important touchstones to the temporary data system measurement. So the existence of the data and the access towards it is not lonely sufficient and it is needed to consider the essence, quality and the proportion of the data use.

The culture of the analytic decision making and its effect on the data utilization: for an effective use of data, the organizations not only should do their best in the establishment of the information technology, data management methods, data sharing and data integration methods that altogether will make a high level of quality, but also they should combine these features to the active use of the informative environment; this environment acts on the decisions which are based on the rationality that means they analyze the data comprehensively (Marchand,2000,69-80). Therefore it is important to pay attention on the on the analytic decision making culture as one aspect of the successful business intelligence systems. There are some studies related to the business intelligence below.

Haghighat Monfared and Malayeri (1389) have done a research by the title of “the effect of the business intelligence on the business processes and organizational performances in Ipco Company”. The result was that there is a meaningful and positive relation between the business intelligence and the business and organizational performance. The business intelligence has an meaningful and positive relation towards the two components of business intelligence (the

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organizational efficiency and the reaction of the organization with the consumers), but it does not have any relations towards the component of organizational relation to the provider.

In an study entitled “evaluation of the SMES manager’s business intelligence on the improvement of the new studies (SMES case study of Rasht)”, (1392) Roghani got the results that there is a meaningful relation between the business skills of the managers (business data processing of the managers, business skills of managers, business knowledge of managers and the business flexibility of them) and the improvement of the new productions.

Popovic et al (2012) in an article entitled “towards the success of the business intelligence systems: the effects of the maturity and the culture on the analytic decision making” shoed that the maturity of the business intelligence systems has a strong effect on the quality of the data accessibility. Moreover, the quality of data content can just affect the utilization of information. Although the effect of the data accessible quality is not that much considerable and can improve the analytic use of the data, it can annihilate the direct effect on the data content quality.

In a study entitled “the improvement of the organizational decision making by the business intelligent” (2008), Visit showed that the organizations measure the factors of decision making so different and in fact they make the decision without the sufficient use of all the surveying criterion.

1.4. The theoretical framework and the contextual model of the research

The theoretical framework is a descriptive and logical web consisting of the relations between the recognized variants. The theoretical framework of this study can be regarded as the model (Sakaran, 2008, cited in Saebi and Shirazi). The business intelligence eminency, data content quality, data accessible quality, data utilization and the culture of analytic decision making shape the variants of this study. The relations between the variants under the study in the contextual model of the study that is taken from the Frolick and ariyachandr,2006 is presented in the diagram below:

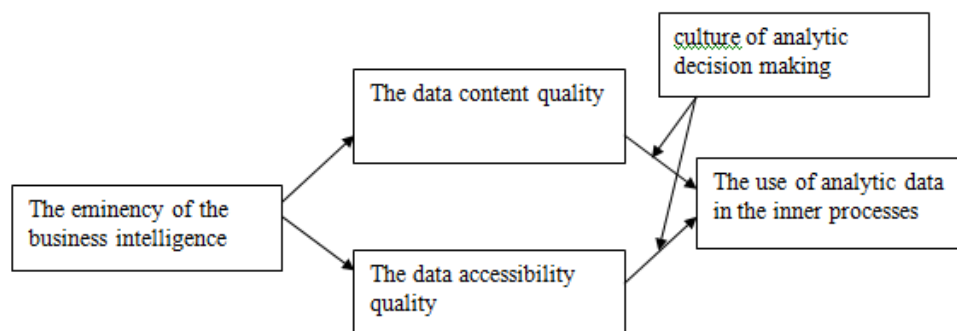


Figure 1. The conceptual model of the study, source: M.N. Frolick, T.R. Ariyachandra (2006).

1.5. Research methodology

From the viewpoint of the objective, this study is practical, descriptive from the viewpoint of the research subject features and it is a field survey method form the viewpoint of time and data gathering. In order to data gathering, and the information of review of literature, the books, articles, theses, and the internet data has been manipulated and the field method has been applied in order to survey the hypotheses by the use of questionnaires.

1.6. Statistical society, research and data analytic tools

Because of the smallness, the statistical society has been regarded the same as the sample bulk that is consisted of 109 personnels of Zanzan Asia insurance and the variant were calculated in a pre-test of 25 people by the spss software and Cronbach's alpha test. The sampling of this study is a whole calculated and to answer the research questions the library studies and questionnaires are used in which the specialized part containg of five swiches according to the likert scale. The descriptive and deduction statistics has been used for the data analysis and the smart-plus software and the structural equation model has been applied to specify the results.

1.7. Description of the research variant indexes

In the chart 1, the research variants related to the descriptive statistics are shown. As it is observed, the least score is 1.75 and the most is 5. The average of the eminency variant score of the business systems is 3.59 and the standard deviation is 0.69. The skewness is negative and the absolute value more than 2 shows the high skewness (Hill Drable 1986). The negative skewness is as the result of left distribution of the skew. The amount of Kurtosis is also equated to the fourth torque, in another words, the Kurtosis is a criterion of the sharp curve in the maximum point (Hasani Pak, 1386). The amount of Kurtosis for the normal distribution is 3 (Johnson et al, 2001).

The average score of data content quality variant is 3.93 and the standard deviation is 0.44. The average score of data accessibility quality variant is 3.58 and the standard deviation is 0.73. The average score of data utilization in business process variant is 3.76 and the standard deviation is 0.51. The average score of the culture of analytic decision making variant is 3.96 and the standard deviation is 0.58. The amounts of skewness and the Kurtosis represent the normal condition of this score’s variant. As it is observed the highest average among the research variants is related to the culture of analytic decision making with average of 3.96 and the least amount is related to the data accessibility quality with the average of 3.58.

Chart 1. Descriptive statistics of the research variants.

	Number	The minimum	The maximum	The average	Deviation standard	The skewness	The kurtosis
The business system eminency	94	1.75	5.00	3.59	0.69	-0.237	0.184
Content quality data	94	2.83	4.67	3.93	0.44	-0.853	0.470
Accessibility data quality	94	1.75	5.00	3.58	0.73	-0.461	-0.168
The use of business procedure data	94	2.14	4.57	3.76	0.51	-1.015	0.966
The culture of analytic decision making	94	3.00	5.00	3.96	0.58	-0.089	-0.891

In chart 2, the results of Kolmogorov–Smirnov test and the Shapiro- Wilk is presented. This tests are done in order to surveying the normal position of the data variant distribution. One of the most important hypotheses of the parametric tests is the normal position of the data variant distribution. According to the results of the chart 2, the amount of the statistics of the Kolmogorov–Smirnov test and the Shapiro- Wilk test of the variants higher than 0.05 is not meaningful. Therefore the zero hypothesis is verified which means that the existed data is normal and the parametric statistical tests can be used for the research hypothesis test.

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Chart 2. The results of Kolmogorov–Smirnov test and the Shapiro- Wilk.

The variants	Kolmogorov–Smirnov			Shapiro- Wilk		
	Statistics	The free degree	The meaningful level	Statistics	The free degree	The meaningful level
The business system eminency	0.123	94	0.200	0.945	94	0.416
Content quality data	0.222	94	0.134	0.852	94	0.115
Accessibility data quality	0.180	94	0.178	0.932	94	0.258
The use of business procedure data	0.218	94	0.140	0.844	94	0.111
The culture of analytic decision making	0.183	94	0.155	0.884	94	0.085

1.8. Hypotheses test

The path structural equation analysis has been used for the research hypotheses test. In order to calculate the indexes and the path factors the smart-plus software has been used. No need to use the high content of sample, has made the PLS method high usage. Whereas the previous methods (Lisrel), needed to a high amount of samples (more than 200) to perform the correct structural equation. The researches with the low content of samples, make two important problems in the structural equations (SEM) with the first generation methods:

1. Non- convergence
2. To present the unsuitable solutions

The researchers do not confront the two problems in the PLS method. The non-sensitivity to the content of the samples is to the extent that the number of the samples can even be less than the whole research variants. According to the fact that the samples are less than 100, the convergence and the model application of Lisrel become problematic. So the method of PLS has been used. The results of the modeling performance of the path structural equation is showed in the chart 3. As it is observed the agent loads of the questionnaire’s questions on the latent agents is higher than 0.5 and because of the higher amount of the calculated t than the critical t at the level of $(2.58)\alpha= 0.01$, the amount of t of the agent loads in the level of 0.01 Alpha is meaningful and it means the value of the variants in the performed model. The calculations of the smart-plus software show that the measuring tool has the sufficient validity to measure the research variants. The variance (AVE) for all the variants is more than 0.5 and it shows the convergence of the questionnaire. The composite reliability and the Cronbach's alpha is higher than 0.7 and it shows the questionnaires’ reliability. In the picture 1, the output of the model is presented.

Chart 3. Results of the modeling performance of the path structural equation.

The latent variant	R2	Cronbach's alpha	composite reliability	AVE	T amount	The agent loads	Questionnaire's questions
The culture of analytic decision making		0.7868	0.8560	0.60	10.1	0.82	Decision1
					5.1	0.65	Decision2
					10.4	0.86	Decision3
					8.2	0.75	Decision4
Accessibility data quality	0.15	0.9533	0.9663	0.88	35.2	0.90	access1
					72.2	0.95	access2
					93.4	0.96	access3
					54.5	0.93	access4
Content quality data	0.17	0.8681	0.9010	0.60	11.0	0.70	content1
					15.9	0.80	content2
					17.3	0.82	content3
					17.4	0.79	content4
					19.8	0.76	content5
					19.5	0.79	content6
the business system eminency		0.8352	0.8883	0.67	16.5	0.74	taali1
					23.5	0.84	taali2
					35.1	0.85	taali3
					28.4	0.84	taali4
The use of business procedure data	0.59	0.8990	0.9190	0.59	13.7	0.72	use1
					33.5	0.84	use2
					16.9	0.77	use3
					15.9	0.75	use4
					21.3	0.78	use5
					22.0	0.80	use6
					16.3	0.75	use7
					12.5	0.71	use8

1.8.1. First hypothesis test

H1= there is a statistical correlation between the business intelligence eminency and the data content quality.

H0= there is not a statistical correlation between the business intelligence eminency and the data content quality.

The correlation factor between the business intelligence eminency and the data content quality (positive 0.409) shows that there is a meaningful and positive relation between these two which is meaningful in a level amount of $t = 4.792$ in a meaningful level of 0.01. Therefore H0 is denied and H1 is verified. (Chart 4).

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Chart 4. The correlation factor between the business intelligence eminency and the data content quality

The variants	Correlation factor	Number	t	The meaningful level
Independent/ the business intelligent eminency Dependent/ the data content quality	0.409	94	4.792	0.01

1.8.2. Second hypothesis test

H1= there is a statistical correlation between the business intelligence eminency and the data accessibility quality.

H0= there is not a statistical correlation between the business intelligence eminency and the data accessibility quality.

The correlation factor between the business intelligence eminency and the data accessibility quality (positive 0.389) shows that there is a meaningful and positive relation between these two which is meaningful in a level amount of $t = 3.939$ in a meaningful level of 0.01. Therefore H0 is denied and H1 is verified. (Chart 5).

Chart 5. The correlation factor between the business intelligence eminency and the data accessibility quality.

The variants	Correlation factor	Number	t	The meaningful level
Independent/ the business intelligent eminency Dependant/ the data content quality	0.389	94	3.939	0.01

1.8.3. The third hypothesis test

H1= there is a statistical correlation between the business intelligence eminency and the data use.

H0= there is not a statistical correlation between the business intelligence eminency and the data use.

The correlation factor between the business intelligence eminency and the data use (positive 0.326) shows that there is a meaningful and positive relation between these two which is meaningful in a level amount of $t = 3.789$ in a meaningful level of 0.01. Therefore H0 is denied and H1 is verified. (Chart 6).

Chart 6. The correlation factor between the business intelligence eminency and the data accessibility quality.

The variants	Correlation factor	Number	t	The meaningful level
Independent/ the business intelligent eminency Dependent/ the data content quality	0.389	94	3.939	0.01

1.8.4. The fourth hypothesis test

H1= there is a statistical correlation between the data content quality and the data use.

H0= there is not a statistical correlation between the data content quality and the data use.

The correlation factor between the data content quality and the data use (positive 0.158) shows that there is a meaningful and positive relation between these two which is meaningful in a level amount of $t = 2.12$ in a meaningful level of 0.05. Therefore H_0 is denied and H_1 is verified. (Chart 7).

Chart 7. The correlation factor between the business intelligence eminency and the data accessibility quality

The variants	Correlation factor	Number	t	The meaningful level
Independent/ the business intelligent eminency Dependent/ the data content quality	0.158	94	2.12	0.05

1.8.5. The fifth hypothesis test

H_1 = there is a statistical correlation between the data accessibility quality and the data use.

H_0 = there is not a statistical correlation between the data accessibility quality and the data use.

The correlation factor between the data accessibility quality and the data use shows that there is a meaningful and positive relation between these two which is meaningful in a level amount of $t = 5.386$ in a meaningful level of 0.01. Therefore H_0 is denied and H_1 is verified. (Chart 8)

Chart 8. The correlation factor between the data accessibility quality and the data.

The variants	Correlation factor	Number	t	The meaningful level
Independent/ the business intelligent eminency Dependent/ the data content quality	0.361	94	5.386	0.01

1.8.6. The sixth hypothesis

The culture of analytic decision making improve the inner processes of the data content quality effect. The correlation factor between the culture of analytic decision making \times the data content quality is -0.148 which is not meaningful with the amount of $t = 1.869$ in a meaningful level of 0.05. Therefore H_0 is verified and H_1 is denied. According to the result it can be stated that the culture of analytic decision making does not have a meaningful effect on the relation of the data content quality and the inner processes data use, so the seventh hypothesis is denied. (Chart 9)

Chart 9. The culture of analytic decision making improve the inner processes of the data content quality effect.

The variants	Correlation factor	Number	t	The result
The culture of analytic decision making \times The data content quality and the use of data in inner processes	-0.148	94	1.869	Non-meaningful effect

1.8.7. The seventh hypothesis

The culture of analytic decision making improve the inner processes of the data accessibility quality effect. The correlation factor between the culture of analytic decision making \times the data accessibility quality is 0.004 which is not meaningful with the amount of $t = 0.07$ in a meaningful level of 0.05. Therefore H_0 is denied and H_1 is verified. According to the result it can be stated that the culture of analytic decision making does not have a meaningful effect on the relation of the data accessibility quality and the inner processes data use, so the seventh hypothesis is denied (chart 10).

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Chart 10. The culture of analytic decision making improve the inner processes of the data accessibility quality effect.

The variants	Correlation factor	Number	t	The result
The culture of analytic decision making × the data content quality and the use of data in inner processes	0.004	94	0.07	Non-meaningful effect

2. DISCUSSION AROUND THE RESULTS OF ANALYTIC DATA

Hypothesis number one: the business intelligence eminency has an effect on the data content quality.

As it is presented in chart 4, there is a positive and meaningful relation between the business intelligence eminency and the data content quality. The result of this test can be interpreted as along with the increase of business intelligence eminency, the data content quality will increase too, and by the increase in the usage of the business intelligence in the organization, the data content quality will improve. The result of this hypothesis verify the results of the researches done by the Popovič(2012), alnoukari(2009) and Shojaei Kiasari et al (1390).

Hypothesis number two: the business intelligence eminency has an effect on the data accessibility quality.

As it is presented in chart 4, there is a positive and meaningful relation between the business intelligence eminency and the data accessibility quality. The result of this test can be interpreted as along with the increase of business intelligence eminency, the data accessibility quality for the insurance personnel will increase too. The application of the business intelligence can help to the faster data accessibility, the easier analysis along with the higher level of mutual relation. The result of this hypothesis verify the results of the researches done by the Popovič(2012), alnoukari(2009), Shojaei Kiasari et al (1390), Hannula(2003) and pirttimaki .

Hypothesis number three: the business intelligence eminency has an effect on the data usage of the inner processes.

As it is presented in chart 6, this hypothesis has been verified and there is a positive and meaningful relation between the business intelligence eminency and the data usage. The result of this test can be interpreted as along with the increase of business intelligence eminency, the data usage will increase too, as it was verified in the last two hypotheses, it can provide the personnel an increase of the accessibility with a higher content and accessibility quality and so increase the motivation. The result of this hypothesis verify the results of the researches done by the alnoukari(2009) and Shojaei Kiasari et al (1390).

Hypothesis number four: the data content quality can affect the data usage of the inner processes.

As it is presented in chart 7, there is a positive and meaningful relation between the data content quality and the data usage. The result of this test can be interpreted as along with the increase of data content quality, the personnel will use the data more and this can result in a better decision making to gain the objectives. The result of this hypothesis verify the results of the researches done by the Popovič(2012), al Citroen(2011), petter et al(2008), makdonof(2013), Roghani (1392), and Bahrami et al(1391).

Hypothesis number five: the data accessibility quality can affect the data usage of the inner processes.

As it is presented in chart 8, there is a positive and meaningful relation between the data accessibility quality and the data usage. The result of this test can be interpreted as along with the increase of data accessibility quality, the personnel will use the data more and this can result in a better decision making to gain the objectives. The result of this hypothesis verify the results of the researches done by the Popovič(2012), makdonof(2013), and Bahrami et al(1391).

Hypothesis number four: the culture of analytic decision making will improve the data usage of the inner processes.

As it is presented in chart 9, this hypothesis was denied that means the culture of analytic decision will not affect the data usage of the inner processes. The result of this test states that the culture of analytic decision will not balance the data usage of the inner processes. In another word, the culture of analytic effect on the data content quality and the data usage is not meaningful. The result of this hypothesis verify the results of the research done by the Popovič(2012).

The hypothesis number seven: the culture of analytic decision quality can improve the data accessibility of the inner processes.

According to the chart 10, this hypothesis was not verified that means the culture of analytic decision cannot affect the data accessibility. The results of the hypothesis indicate that by the increase in the culture of analytic decision cannot result the accessibility of the data and in fact the increase of the decision culture does not have a meaningful effect on this act.

3. THE RESULT

The insurance companies keep a huge amount of data in their informative banks such as car, life, social insurances. Often this data is accessible only for that company's personnel and the integration of the organizational data is a kind of nightmare for the information technology team and is restricted to the information retrieval from different information banks and data transformation to the wide scale software and we can solve the problems by the help of business intelligence and with the objective of effective decision factors. This study is used for the study of the relations between the business intelligence eminency, data qualities, the culture of the analytic decision making and the use of the data as an important element of the business intelligence systems. The analysis of the insurance personnel data has been done by the descriptive statistics and the structural equation modelling and the result indicates that the business intelligence eminency has a meaningful and positive effect on the data quality consisting the content and accessibility of data. It means that the increase on the use of business intelligence will increase the data quality that results in the more use of the data and total result of the better decision making is done. On the opposite side, the increase of the analytic decision making has not shown a meaningful change in any of the aspects of the business intelligence success.

4. THE SUGGESTIONS ACCORDING TO THE RESEARCH RESULT

It is suggested that the insurance company make the use of high speed net and the inner organizational web in order to intelligence making and the growth and improvement and also the insurance company provide the sufficient motivation and the acknowledgement to heighten the data quality and the method of its use in the organizational inner processes. According to the innovative aspect of the research, the research field is open to the more studies and any related research seems new.

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