

**THE EFFECT OF QUALITY OF BUSINESS INTELLIGENCE SYSTEM ON  
QUALITY OF DECISION MAKING (SURVEY ON FINANCIAL INSTITUTIONS IN  
MEDAN CITY – NORTH SUMATERA)**

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**ABSTRACT:** *This study aims to examine the effect of quality of business intelligence systems on quality of decision making at financial institutions in Medan City, North Sumatra. Survey conducted on 54 operational managers to gather information and to test the hypothesis of a study. Data was collected using questionnaires. The data analyzed with simple regression analysis, while hypothesis testing used was t-test. Results of this study shown that quality of business intelligence system have significant effects on the quality of decision making.*

**KEYWORD:** Quality, Business Intelligence System, Decision Making

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## **INTRODUCTION**

Information systems and technologies are vital components of successful businesses and organizations (Obrien and Marakas, 2010:4). Information systems are an integral part of organizations, there would be no business without an information system (Laudon and Laudon, 2012:18). Information systems have become as integrated into our daily business activities as accounting, finance, operations management, marketing, human resource management, or any other major business function (Obrien dan Marakas, 2010:4)

Business intelligence system is one type of information management system (Venkatadri et.al, 2010). ISs whose purpose is to glean from raw data relationships and trends that might help organizations compete better are called business intelligence (BI) systems (Effy Oz, 2009:20).

Business decisions depend on the quality of the information used to make such decisions (Haag et.al, 2008:63). BI helps a company to create knowledge from that information to enable better decision making and to convert those decisions into action (Chuck et.al, 2006:23). BI refers to all applications and technologies in the organization that are focused on the gathering and analysis of data and information that can be used to drive strategic business decisions (Obrien and Marakas, 2010:11). The main purpose of business intelligence systems is to provide knowledge workers with tools and methodologies that allow them to make effective and timely decisions (Carlos, 2009:5).

This study aimed to examine the effect of quality of business intelligence systems on quality of decision making at financial institutions in Medan City, North Sumatera.

## **LITERATURE REVIEW**

### **Quality of Business Intelligence System**

According to Laudon and Laudon (2012:49) business intelligence is a contemporary term for data and software tools for organizing, analyzing, and providing access to data to help managers

and other enterprises user make more informed decision. Furthermore, Valacich and Schneider (2012:265) stated that business intelligence systems can provide business decision makers with a wide variety of analyses to support decision making. Whereas, Turban and Volonino (2011:325) stated that business intelligence refers to a collection of ISs and technologies that support managerial decision making or operational control by providing information on internal and external operations. Gelinias and Dull (2008:589) stated that business intelligence is the integration of statistical and analytical tools with decision support technologies to facilitate complex analyses of data warehouse by managers and decision makers. Moreover, Effy Oz (2009:20) stated that ISs whose purpose is to glean from raw data relationships and trends that might help organizations compete better are called business intelligence (BI) systems.

Based on some previous statement it can be concluded that business intelligence system is a collection of ISs and technologies that support managerial decision making or operational control by providing information on internal and external operations and help organizations compete better.

In general, BI tools correspond to one or several of the following categories: data warehouse tools, data mining tools and Online analytical processing (Harison, 2012).

Venkatadri et.al (2010) stated that BI System build upon the integration of databases, data warehousing technologies, Web services, and Advanced advanced visualized interface.

Datawarehouse containing details and summary data in one year and are used to process transactions. Data mining is the use of advanced analysis tools including intelligence techniques to reveal relationships between data (Romney and Steinbart, 2012: 108-109). While online analytical processing is a complex process quickly and multidimensional analysis of existing data in the database to obtain optimal results in particular using software tools in the form of graphs (Valacich and Schneider, 2012: 250)

Adamala and Cidrin (2011) mentioned the most obvious first choice when trying to discover BI success factors is to look at information systems (IS) in general. Petter et.al (2013) stated that system quality considers the technical aspect of system, including convenience of access, system functionality, reliability, response time, sophistication, navigation ease, and flexibility among other. Zaied (2012) explained that measures of system quality typically focus on performance characteristic of the system under study. In this work, the selected system quality element are: reliability, usability, adaptability, trust and maintainability. Gorla et.al (2010) stated the indicator of system quality: flexibility and sophistication. Petter et.al (2008) explained that system quality-the desirable characteristics of an information system. For example: ease to use, system flexibility, system reliability, and ease to learning, as well as system features of intuitiveness, sophistication, flexibility, and respon time. Wixon and Todd (2005) stated, characteristics of quality information system is reliability, flexibility, integration, accesibility and timelines. DeLone and McLean (2003) stated, system quality: adaptability, availability, reliability, response time and usability. Srinivasan (1985) use dimensions: respon time, system reliabiity, and ease to access. Bailey dan Pearson (1983) use dimensions: system access time, system flexbility, system integration and system response time.

This study use four indicators to measure of quality of business intelligence system: flexibility, reliability, accessibility dan integration.

## **Quality of Decision Making**

Several experts has been explain about of decision-making. According to Haag et al (2005:133) the decision is one of the most important business activities. Moreover, McShane and Glinow (2010:198) stated that decision making is the conscious process of making choise among alternatives with the intention of moving toward some desired state of affairs. Furthermore, Turban et.al (2011:41) stated that decision making is a process of choosing among two or more alternative courses of action for the purpose of attaining one or more goals. Whereas, Carlos (2009:24) stated that the decision-making process is part of a broader subject usually referred to as problem solving, which refers to the process through which individuals try to bridge the gap between the current operating conditions of a system (as is) and the supposedly better conditions to be achieved in the future (to be).

Based on the statements of the above it can be concluded that the decision making is a conscious process that is carried out by someone in determining choice of a wide range of alternative actions to achieve the goal of moving from the present into the future conditions better.

Decision quality refers to the technical aspects of a decision. A decision is considered to be of high quality to the extent that its concistent with the organizational goals to be attained and with potentially available information (Gibson et.al, 2009:342). ) stated that the quality of decision making construct is composed of items such as: a perceived increase in the quality of decisions and reduction of the time required for decision making (Caniels and Bakens, 2012)

Based on the statements of the above it, this study use three indicators to measure of quality of decision making, namely: concistent with the organizational goals, a perceived increase is in the quality of decisions, and the reduction of the time required for decision making

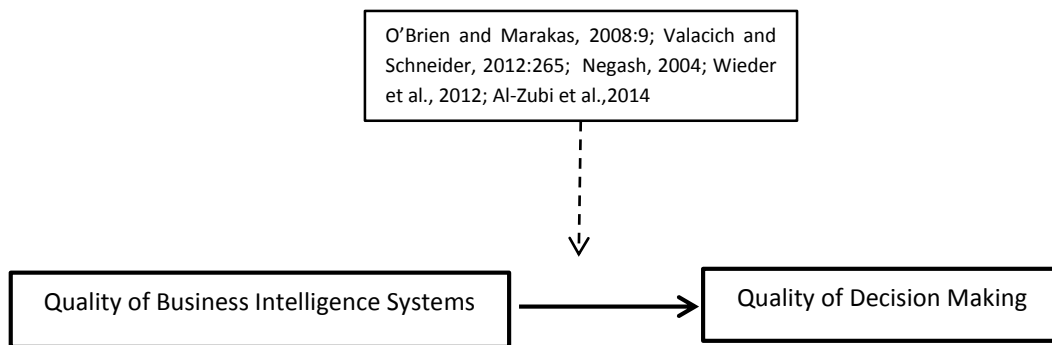
## **Theoretical Framework and Hypotheses Development**

### **The quality of business intelligence system and quality of decision making**

O'Brien and Marakas (2008:9) stated that information system also help store managers and other business professionals make better decisions. Valacich and Schneider (2012:265) stated that business intelligence systems can provide business decision makers with a wide variety of analyses to support decision making. Negash (2004) stated that a business intelligence system can improve the timelines and quality of the input to the decision making process.

Some previous researchers have studied the effect of the quality of business intelligence systems on the quality of decision-making, such as Wieder et.al (2012) and Al-Zubi et.al(2014). Their results proved that the quality of business intelligence systems affect the quality of decision making.

Based on the description in the above framework, the model of this study can be seen as follows:



**Figure 1: The Study Model**

Furthermore, the hypothesis proposed in this study is quality of business intelligence system have effects on quality of decision making.

## METHODOLOGY

The method used in this study is explanatory survey method. The population in this study were financial insitutions at Medan City, North Sumatera. The companies chosen in this study have been implementing business intelligence system application. The participants of the study were operational managers. Eighty questionares were distributed to the numbers of the sample, 54 questionares were returned and used in the statistical analysis by using Statistical Product and Service Solutions. The instrument used for the collection data was a questionnaire. The questionnaire included dimensions quality of business intelligence system and quality of decision making. This study used a Likert five point scale ranges from “strongly disagree” to “strongly agree” to examine participants responses to questionnaire statements. The questionnaires to be used previously tested for validity and reliability. Furthermore, the analysis method used simple regression analysis, while hypothesis testing used t test. All analyzes were performed using the program Statistical Product and Service Solutions.

## Finding and Discussions

Recapitulation validity test results on research instrument (questionnaire) can be seen in table 1 below:

**Tabel 1: Recapitulation Validity of Test Results**

Variabe	Item	Validity		
		Corrected Item-Total Correlation	Critical R	Explanation
Quality of Business Intelligence System	QBIS1	0,683	0,2007	Valid
	QBIS2	0,749	0,2007	Valid
	QBIS3	0,524	0,2007	Valid
	QBIS4	0,697	0,2007	Valid
	QBIS5	0,317	0,2007	Valid
	QBIS6	0,641	0,2007	Valid

Quality of Decision Making	QDM1	0,928	0,2007	Valid
	QDM2	0,787	0,2007	Valid
	QDM3	0,928	0,2007	Valid
	QDM4	0,563	0,2007	Valid
	QDM5	0,928	0,2007	Valid

From tabel-1 above shows coefficient values for all variables the overall study is greater than the value of r (table = 0,2007). This means that the whole point statement has good validity so that the data collected can be analyzed at a later stage.

Recapitulation reliability test results with Cronbach's Alpha on research instrument (questionnaire) can be seen in table 2 below:

**Table 2: Recapitulation Reliability of Test Results**

No	Variabel	Cronbach's Alpha	Critical point	Explanation
1	Quality of Business Intelligence System	0,820	0,700	Reliable
2	Quality of Decision Making	0,927	0,700	Reliable

From Table 2 above shows the value of the coefficient of reliability for the entire variabel tested also above the critical point of 0.70, This means that the questionnaire used to have good reliability so that it can be concluded that the data collected in this study is reliable and can be used for analysis stage

Furthermore, the results of multiple regression analysis using is seen in the following table 3:

**Table 3: Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8,477	1,591		5,327	,000
	Quality of Business Intelligence System	,290	,106	,355	2,741	,008

a. Dependent Variable: Quality of Decision Making

Based on the table 3 above can be composed of simple regression equation as below:

$$QBIS = 8,477 + 0,290 QDM + e$$

The simple regression equation above can explain the role of quality of business intelligence systems on quality of decision making as seen from the magnitude of the regression coefficients. The above equation shows that the regression coefficient of quality of business intelligence system of 0,290

Furthermore, to measure ability of model to explain effects of independent variables on dependent variable seen from the magnitude of the coefficient of determination ( $R^2$ ) as shown in the table 4 below:

**Table 4: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,355 <sup>a</sup>	,126	,109	2,87412

a. Predictors: (Constant), Quality of Business Intelligence System

The table 3 above shows the value of R square ( $R^2$ ) of 0,126 means ability of independent variables in explaining dependent variable of 12,6%, while 87,4% of independent variables described other variables that are not included in this study.

The hypothesis testing of effect the quality of business intelligence systems on quality of decision making can be seen from the t value and significance values. The table 3 above shows the t value of 2,741 while the df n-2 (54-2 = 52) found the value of t table of 2.0066. When compared  $t_{count} > t_{table}$  so that it can be concluded  $H_0$  rejected or  $H_1$  accepted. This conclusion can also be proven that the significant value of quality of business intelligence system  $0.008 < 0.05$ , which means the quality of business intelligence systems have significant effect on the quality of decision making. If the quality of business intelligence systems increases, it will improve the quality of decision-making. In other words, improving the quality of business intelligence systems lead to improved quality of decision-making. Carlos (2009:5) explained if decision makers can rely on a business intelligence system facilitating their activity, we can expect that the overall quality of the decision-making process will be greatly improved.

Results of this study support previous studies that stated quality of business intelligence system effect on quality of decision making, such as research: Wieder et.al (2012) and Al-Zubi et.al (2014)

## CONCLUSION

This study aimed to examine the effect of quality of business intelligence systems on quality of decision making at financial institutions in Medan City, North Sumatera. The results of this study shown that the quality of business intelligence systems have significant effects on quality of decision making.

## REFERENCES

Adamala, Szymon and Linus Cidrin (2011). Key Success Factors in Business Intelligence. Journal of Intelligence Studies in Business. 1. pp.107-127

- Al-Zubi, Ziad; Osama Samih Shaban and Nabil Alnaser (2014). The effect of Business Intelligence Tools on Raising the Efficiency of Modern Management Accounting. *International Review of Management and Business Research* Vol. 3 Issue.1 pp:68-77
- Bailey, James E. and Sammy W. Pearson (1983). Development Of A Tool For Measuring And Analyzing Computer User Satisfaction. *Management Science*. Vol.25. No.5. May, pp. 530-545
- Caniels Marjolein and Ralph J J M Bakens. 2012. The Effects Of Project Management Information Systems On Decision Making In A Multi Project Environment. *International Journal of Project Management* 30 pp 162–175.
- Carlos Vercellis (2009). *Business Intelligence: Data Mining and Optimization for Decision Making*. United Kingdom. John Wiley & Sons, Ltd.
- Chuck Ballard; Daniel M. Farrell; Amit Gupta; Carlos Mazuela and Stanislav Vohnik (2006). *Dimensional Modeling: In a Business Intelligence Environment*. First Edition. USA. International Business Machines Corporation
- DeLone, William H. and Ephraim R. McLean (2003). The DeLone and McLean Model of Information System success: A Ten-Year Update. *Journal of Management Information Systems*. Spring. Vol.19. No.4. pp. 9-30
- Effy Oz (2009), *Management Information Systems*. Sixth Edition. USA. Cengage Learning Inc.
- Gibson James L, John M. Ivancevich, James H Donnelly Jr and Robert Konopase. (2009). *Organizations: Behavior, Structure, Process*. Thirteenth Edition. New York. The McGraw Hill Companies Inc
- Gorla, Narasimhaiah, Toni M. Somers and Betty Wong (2010). Organizational Impact Of System Quality, Information Quality, and Service Quality. *Journal of Strategic Information System*. 19. pp.207-228
- Haag Stephen, Pauge Baltzan and Amy Phillips (2008). *Business Driven Technology*. Second Edition. New York. McGraw Hill Companies Inc.
- Haag, Stephen. Maeve Cummings and Donald J. McCubbrey Hill (2005). *Management Information System for the Information Age*. New York: McGraw Hill.
- Harison, Elad (2012). Critical Success Factors of Business Intelligence System Implementation: Evidence from the Energy Sector. *International Journal of Enterprise Information System*. April-June 8 (2) pp:1-13
- Laudon. Kenneth C and Jane P. Laudon (2012). *Management Information System: Managing the Digital Firm*. Twelfth Edition. New York. Prentice Hall
- McShane, Steven L. And Mary Ann Von Glinow. 2010. *Organizational Behavior: Emerging Knowledge, Global Reality*. Fifth Edition. USA: McGraw-Hill Education
- Negash, S. (2004). Business Intelligence. *Communication of the Association for Information System*. Vol. 13. pp 177-195
- O'Brien, James A. and George M. Marakas (2010). *Introduction To Information Systems*. Fifteenth Edition. New York. The McGraw-Hill Companies Inc.
- Petter, Stacie; William Delone and Epharim Mclean (2008). Measuring Information System Success: Model, dimensions, measures, and interrelationship. *European Journal of Information System*. 17. pp.236-263
- Petter, Stacie; William Delone and Epharim Mclean (2013). Information System Success: The Quest for the Independent Variabels. *Journal of Management Information System*. Spring. Vol.29. No.4.pp.7-61
- Romney, Marshall B and Paul J. Steinbart (2012). *Accounting Information System*. Twelfth Edition. London. Pearson Education Limited

- Srinivasan, Ananth (1985). Alternative Measures of System Effectiveness: Associations and Implications. *MIS Quarterly*. September. pp.243-253
- Turban, Efraim dan Linda Volonino (2011). *Information Technology for Management Improving Strategic and Operational Performance*. 8th Edition. United State of Amerca. John Wiley & Sons Inc.,
- Valacich, Joe and Christoph Schneider (2012). *Information Systems Today Managing in the Digital World*. Fifth Edition. New York. Prentice Hall
- Venkatadri, M; Hanumat G. Sastry; and Manjunath G (2010). A Novel Business Intelligence System Framework. *Universal Journal of Computer Science and Engineering Technolog.* 1 (2). 112-116
- Wieder, Bernhard; Maria-Luise Ossimitz and Peter Chamoni. (2012). The Impact of Business Intelligence Tools on Performance: A User Satisfaction Paradox?. *International Journal of Economic Sciences and Applied Research*. 5. (3): 7-32
- Wixon, Barbara H and Petter A. Todd. 2005. A Theoretical Integration of user satisfaction and technology acceptance. *Information sytems research*. Vol.16, No.1, March. pp.85-102
- Zaied, Abdel Nasser H. (2012). An Integrated Success Model for Evaluating Information System in Public Sectors. *Journal of Emerging Trends in Computing and Information Sciences*. Vol.3. No.6. July. pp.814-825