European Journal of Accounting Auditing and Finance Research
Vol.5, No.9, Pp.81-91, October 2017
Published by European Centre for Research Training and Development UK (www.eajournals.org)

THE INDUSTRY 4.0 FACTOR AFFECTING THE SERVICE QUALITY OF COMMERCIAL BANKS IN DONG NAI PROVINCE

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ABSTRACT: *Vietnam has favorable conditions for access to join the 4.0 industrial revolution (Industry 4.0). Vietnam has a young population structure, most of them live in rural areas but the level of education and access to new technology services by Vietnamese people is quite high compared to other countries in the world. The percentage of people using mobile phones is also high, with more than one mobile subscriber per capita. In that context, the banking service quality sector in general as well as the payment sector in particular has witnessed the strong impact from Industry 4.0, together with the introduction of a number of new technology applications. In the field of finance - banking (Fintech); Commercial banks have brought many opportunities and challenges for the banking industry, including payment operations in Vietnam. The study results showed that there were 200 staffs related to commercial banks who interviewed and answered about 9 questions. Data collected from July 2016 to July 2017 for the staffs of commercial banks in Dong Nai province. The paper had been analyzed KMO test, Cronbach's Alpha and the result of KMO analysis which used for multiple regression analysis. Bank staffs' responses measured through an adapted questionnaire on a 5-point Likert scale (Conventions: 1: Completely disagree, 2: Disagree, 3: Normal; 4: Agree; 5: completely agree). Hard copy and online questionnaire distributed among 50.000 the staffs of commercial banks in Vietnam. In addition, the exploratory factor analysis (EFA) results showed that there were two factors, which included of factors following: Industry 4.0 human resources (X1) and Industry 4.0 network security (X2) with significance level 5 percent. In addition, all of two components affecting the service quality of commercial banks with significance level 5 percent. The research results processed from SPSS 20.0 software.*

KEYWORDS: Industry 4.0, Service Quality, Commercial Bank, LHU

INTRODUCTION

Nowadays, commercial banks have the digital banking model, operating on the basis of technology through digital devices connected to the computer software through the Internet environment, having in fact been and will change the entire structure of the system. The Industry 4.0 will also provide new insights into how communication and business processes are transformed through interaction and communication. Besides, commercial banks have the growing telecommunications infrastructure; the conversations tend to be video-calls with increased levels of quality and stability. Therefore, customer care at commercial banks may also require additional telemarketing skills. In the distant future, virtual-reality and holographic technology will be able to completely replace human communication. 3D calls like in fiction films may not be far off. For distribution channels and traditional banking products and services have changed quickly. The Industry 4.0 will completely change the distribution channel and traditional banking products. In the past 10 years, the emergence of

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

smart phones has changed the way people communicate and interact, resulting in changes in distribution channels, sales networks, and design. Service products of banks such as Internet banking, mobile banking, social networking, digital banking and paperless transactions will be a strong trend. The customer experience will be the dominant trend, in some developed countries; including developing countries appear more and more "paperless bank".

In addition, commercial banks will apply the digital conversion application; the bank's products can be integrated with a variety of supporting products to satisfy customers. Applying the principles of the Industry 4.0, issues such as application programming interfaces (APIs), seamless delivery, or intelligence analysis will be a common trend in application development. Commercial banks will have services especially high-tech products of banks. Besides, Big Data and customer behavior analysis are also becoming the future trend in the digital action, thanks to the fact that supportive technology can collect data inside and outside the organization. Customer behavior analysis aims to improve service quality, bring added value, contribute to cost reduction, and support decision-making processes. Facing this situation, the researchers had chosen topic **"*The industry 4.0 factor affecting the service quality of commercial banks in Dong Nai province***" as a paper. This paper helps policy makers who apply them for improving policy on the management of the service quality of commercial banks in Vietnam.

LITERATURE REVIEW

Industry 4.0 human resources: Industry 4.0 human resources play an important part of developing and making a company or organization at the beginning or making a success at the end, due to the labor provided by employees. Human resources is intended to show how to have better employment relations in the workforce. Also, Industry 4.0 human resources are to bring out the best work ethic of the employees and therefore making a move to a better working environment**.** Industry 4.0 is a name for the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things, cloud computing and cognitive computing. Industry 4.0 creates what has been called a "smart factory". In the future, teams will increasingly search for, qualify and motivate their members themselves. The human resources department must use new technologies and concepts to enable every area to identify suitable talents and deploy them in the best possible way. **Heneman III, Herbert; Judge, Timothy A (2005).**

Industry 4.0 network security: Network security consists of the policies and practices adopted to prevent and monitor unauthorized access, misuse, modification, or denial of a computer network and network-accessible resources. Network security involves the authorization of access to data in a network, which is controlled by the network administrator. Users choose or are assigned an ID and password or other authenticating information that allows them access to information and programs within their authority. Network security covers a variety of computer networks, both public and private, that are used in everyday jobs; conducting transactions and communications among businesses, government agencies and individuals. Networks can be private, such as within a company, and others which might be open to public access. Network security is involved in organizations, enterprises, and other types of institutions. It does as its title explains: It secures the network, as well as protecting and overseeing operations being done. The most common and simple way of protecting a

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

network resource is by assigning it a unique name and a corresponding password. **Shanka, Mesay Sata (2012).**

Service quality: Service quality (SQ), in its contemporary conceptualization, is a comparison of perceived expectations (E) of a service with perceived performance (P), giving rise to the equation SQ = P - E. This conceptualization of service quality has its origins in the expectancy-disconfirmation paradigm. A business with high service quality will meet or exceed customer expectations whilst remaining economically competitive. Evidence from empirical studies suggests that improved service quality increases profitability and long term economic competitiveness. Improvements to service quality may achieved by improving operational processes; identifying problems quickly and systematically; establishing valid and reliable service performance measures and measuring customer satisfaction and other performance outcomes. A customer's expectation of a particular service is determined by factors such as recommendations, personal needs and past experiences. The expected service and the perceived service sometimes may not be equal, thus leaving a gap. The service quality model or the 'GAP model' developed in 1985, highlights the main requirements for delivering high service quality. It identifies five 'gaps' that cause unsuccessful delivery. Customers generally have a tendency to compare the service they 'experience' with the service they 'expect'. If the experience does not match the expectation, there arises a gap. Ten determinants that may influence the appearance of a gap were described by **Parasuraman, Zeithaml and Berry**. We have the SERVQUAL model: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding the customer and tangibles.

METHODS OF RESEARCH

The purpose of paper is to discover answers to questions through the application of scientific procedures. The main aim of paper is to find out the truth which is hidden and which has not been discovered as yet. Though each study, the paper has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings: (1) To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulated research studies); (2) To portray accurately the characteristics of a particular individual, situation or a group (Studies with this object in view are known as descriptive research studies); (3) To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies); (4) To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

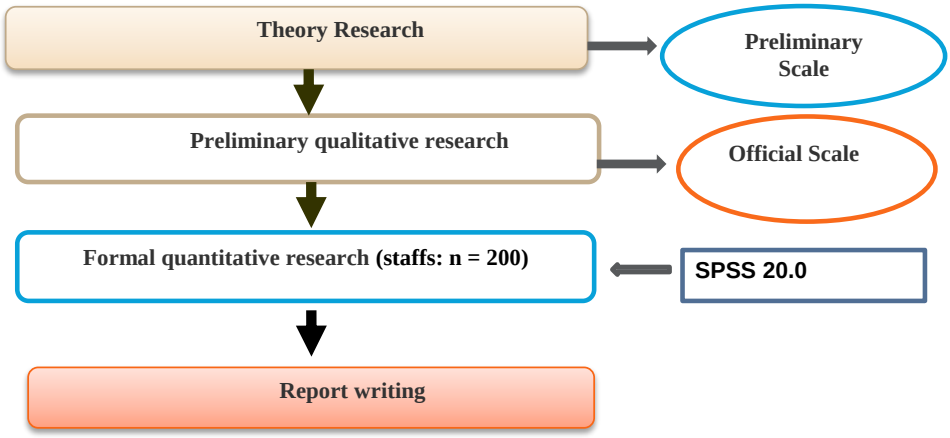

Figure 1: Data processing for the service quality of commercial banks in Dong Nai province

After the data have been collected, the researchers turn to the task of analyzing them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences. The unwieldy data should necessarily be condensed into a few manageable groups and tables for further analysis. Thus, researcher should classify the raw data into some purposeful and usable categories. (1) ***Coding*** operation is usually done at this stage through which the categories of data are transformed into symbols that may be tabulated and counted. (2) ***Editing*** is the procedure that improves the quality of the data for coding. With coding the stage is ready for tabulation. (3) ***Tabulation*** is a part of the technical procedure wherein the classified data are put in the form of tables. The mechanical devices can be made use of at this juncture. A great deal of data, especially in large inquiries, is tabulated by computers. Computers not only save time but also make it possible to study large number of variables affecting a problem simultaneously. Data collected were tested by the reliability index (excluding variables with correlation coefficients lower < 0.30 and variable coefficient Cronbach's alpha < 0.60). The hypothesis was tested through multiple regression analysis with linear Enter method. $Y = \beta_0 + \beta_1 X1 + \beta_2 X2$

Y: the service quality of commercial banks; β_0 - β_2: Regression coefficients. X1 – X2: Factors affecting the service quality of commercial banks. Independent variables are following: Industry 4.0 human resources (X1) and Industry 4.0 network security (X2). Hypothesis: two factors have positive relation to the service quality of commercial banks.

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RESEARCH RESULTS

Table 01: Cronbach's Alpha test for factors affecting the service quality of commercial banks

Code	Industry 4.0 human resource (HR)	Cronbach's Alpha
HR1	The Industry 4.0 human resource is sufficient to needs for the service quality of commercial banks for both professional banking and information technology	0.910
HR2	The Industry 4.0 human resource training is the task of business priorities of the service quality of commercial banks such as security vulnerabilities also increase	
HR3	Commercial Banks have capacity of forecasting labor demand and supply of the industry 4.0 is good for business in the service quality	
HR4	Commercial Banks encourages and facilitates employees to learn and control by industry 4.0 for the service quality of commercial banks	
Code	**Industry 4.0 Network security (NS)**	**Cronbach's Alpha**
NS1	The Commercial Banks have many modern technologies to meet for the service quality of commercial banks such as financial transactions by industry 4.0	0.929
NS2	The Commercial Banks have many modern technologies to make new products/Services for the service quality of commercial banks such as safety and security	
NS3	The Commercial Banks have invested many modern technologies to improve the service quality and network security	
Code	**THE SERVICE QUALITY OF COMMERCIAL BANKS (SQ)**	**Cronbach's Alpha**
SQ1	Industry 4.0 human resource (HR) is affecting the service quality of commercial banks	0.603
SQ2	Industry 4.0 Network security (NS) is affecting the service quality of commercial banks	

(Source: The researchers' collecting data and SPSS)

Table 01 showed that Cronbach's Alpha test for factors affecting the service quality of commercial banks include: all of variables in Industry 4.0 human resource (HR) surveyed Corrected Item-Total Correlation greater than 0.3 and Cronbach's Alpha if Item deleted greater than 0.6 and Cronbach's Alpha is very reliability. Table 01 showed that all of variables surveyed Corrected Item-Total Correlation greater than 0.3 and Cronbach's Alpha if Item deleted greater than 0.6 and Cronbach's Alpha is very reliability. Such observations make it eligible for the survey variables after testing scale. This showed that data was suitable and reliability for researching.

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Table 02: KMO and Bartlett's Test for factors of the service quality of commercial banks

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.756
Bartlett's Test of Sphericity	Approx. Chi-Square	1050.253
	df	21
	Sig.	.000

Total Variance Explained

Com.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.385	48.357	48.357	3.385	48.357	48.357	3.213
2	2.424	34.634	82.990	2.424	34.634	82.990	2.710
3	.364	5.204	88.194				
4	.302	4.313	92.508				
5	.261	3.723	96.231				
6	.177	2.526	98.757				
7	.087	1.243	100.000				

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

(Source: The researchers' collecting data and SPSS)

Table 02 showed that KMO and Bartlett's Test for factors of the service quality of commercial banks such as the results showed that KMO coefficient had: $0.5 \leq KMO \leq 1$ (KMO: Kaiser-Meyer-Olkin). KMO is an index used to examine the appropriateness of factor analysis. KMO value significantly larger factor analysis is appropriate. KMO coefficient is 0.756 and the level of significance (Sig) is 0.000. Exploratory Factor Analysis (EFA) is consistent with survey data of 200 the staffs of of commercial banks but 191 staffs processed by SPSS 20.0.

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Table 03: Structure Matrix for factors affecting the service quality of commercial banks

Code	Component	
	X1	X2
HR3	.918	
HR4	.903	
HR2	.893	
HR1	.839	
NS1		.967
NS2		.920
NS3		.919

(Source: The researchers' collecting data and SPSS)

Table 03 showed that structure Matrix for factors affecting the service quality of commercial banks such as there are two factors: Industry 4.0 human resources (X1) and Industry 4.0 network security (X2).

Table 04: KMO and Bartlett's Test for the service quality of commercial banks

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	24.434
	df	1
	Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.349	67.434	67.434	1.349	67.434	67.434
2	.651	32.566	100.000			

Component Matrix[a]

Code	Component
	1
SQ1	.821
SQ2	.821

(Source: The researchers' collecting data and SPSS)

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Table 04 showed that KMO and Bartlett's Test for the service quality of commercial banks such as the results showed that KMO coefficient had: KMO = 0.500 (KMO: Kaiser-Meyer-Olkin). KMO is an index used to examine the appropriateness of factor analysis. KMO value significantly larger factor analysis is appropriate. KMO coefficient of the service quality of commercial banks is 0.500 and the level of significance (Sig) is 0.000.

Table 05: Factors affecting the service quality of commercial banks

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.631[a]	.398	.392	.43736	1.593

a. Predictors: (Constant), X2, X1
b. Dependent Variable: Y

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.802	2	11.901	62.217	.000[b]
	Residual	35.962	188	.191		
	Total	59.764	190			

a. Dependent Variable: Y
b. Predictors: (Constant), X2, X1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
	(Constant)	1.768	.140		12.659	.000		
	X1	.316	.035	.522	9.125	.000	.979	1.021
	X2	.186	.024	.438	7.669	.000	.979	1.021

(Source: The researchers' collecting data and SPSS)

Table 05 showed that factors affecting the service quality of commercial banks such as column t > 2, smaller significance level 0.05 and statistically significant data to explain the variation of the the service quality of commercial banks, Adjusted R Square is 0.392 or 39.2 %.

Besides, the regression coefficient is positive. This means that the impact of the independent variables in the same direction with the service quality of commercial banks. Moreover, the regression results showed the Durbin - Watson stat = 1.593 said no autocorrelation phenomena. Variance Inflation Factor (VIF) is exaggerated coefficient variance, when VIF value exceeding 10.0 is shown signs of multicollinearity phenomenon. While table 05 results can assert no correlation between the independent variables in the equation. Meaning no multicollinearity phenomenon by VIF values less than 10.

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CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The Industrial Revolution 4.0 is a revolutionary change due to its breakthrough pace, its far-reaching scope and its tremendous social impact. Especially the banking sector will have many new changes such as changing the mode of banking operations such as Internet Banking, Mobile banking... This study objective is to identify the impact and development trend of banking operations in the process of the 4.0 industrial revolution helps commercial banks to better prepare the necessary resources and to move in the right direction. In the time of renovation, there are appropriate policies to seize the opportunities and overcome the challenges that help the banking system to ensure a safe and sustainable development in its business. The study results showed that there were 200 staffs interviewed and answered about 9 questions but 191 staffs of commercial banks processed, lack of 9 samples. The paper had been analyzed KMO test, Cronbach's Alpha and the result of KMO analysis which used for multiple regression analysis. Industry 4.0 human resources (X1) and Industry 4.0 network security (X2) affecting the service quality of commercial banks with significance level 5 percent. The research results processed from SPSS 20.0 software. We have recommendations following:

Recommendations

Recommendation for Industry 4.0 human resources

The 4.0 industry revolution allows banks to deploy and upgrade electronics to new heights with cost savings. Especially, this sector can cut down on human resources but the quality of human resources will be improved. Therefore, workers first need to seriously evaluate their own qualifications and must learn while doing to constantly improve their professional skills, foreign language, good at a profession, know many jobs to be ready to meet. There are requirements of the job in the new age. Each employee is trained to work both independently and can work collectively, even collaborating with the internet. In every stage of social development, people are central. The world has undergone many technological breakthroughs and every time people are put at risk of losing their jobs, but that has not happened due to the ability to adapt for many new jobs. Commercial banks support particularly for the training of personnel while sitting at universities, it is necessary to focus on the practical training, professional skills as well as soft skills. Universities need to analyze and direct their career paths, helping students to identify career paths that fit their abilities. Hence, the quality of human resources training before job application, reduce the unemployment. Universities are to do that, changing the human resources training method, towards the development of capacity and the full complement of advanced knowledge. Human resource training will be clearer and more appropriate, suitable with the scale and style of the commercial banks.

In addition, commercial banks should coordinate with organizations; centers specializing in personnel training to help staff can be trained professional. It helps employees improve their professional skills even when they are working. It is necessary to organize staff training courses, to be improved and developed according to human resources such as new and old ones, senior managers and subordinate personnel, etc. to have effective human resource training solutions. In order to meet the requirements of competition in the context of integration, personnel must not only meet the quantitative requirements but must ensure the

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

quality, not only in the staff but also in the management personnel. Because of only qualified human resources can operate the system well.

Recommendation for Industry 4.0 network security

The commercial banks continue to determine that banking technology will occupy an especially important position in the development strategy of the sector. In addition to requiring credit institutions, commercial banks must ensure the financial capacity and capacity of their staff to meet the needs of modernization. The commercial banks will proceed to create a full legal environment. For the safe development of technology, full coverage of new technology services and new service providers. Thus, despite the fact that IT is the pioneer in information technology, the commercial banks still need more quickly development to improve them, improve security and ensure network security. This issue not only determines the survival of the bank but also helps the bank to develop more services, attract customers and increase competitiveness in the context of global integration.

Besides, commercial banks need to be refreshed to meet the needs of integration through diversification of products and quality services, application of modern technology. In order to meet the demands of competition in the new era, commercial banks need to diversify the products and services in the direction of combining the promotion of traditional products and services while exploiting the development of new products such as products. Commercial banks need to increase the attractiveness of overseas remittance sources in coordination with labor export companies, remittance service companies, overseas remittance agencies, foreign correspondent banks, etc. Commercial banks should have policies to exploit and facilitate the development of remittance services through the banking system; Deploying asset management services, trusting investors, providing information and advice to clients, etc.

Product diversification is a strength and a key to developing banking services, especially personal banking. In particular, focus on high-tech products that have outstanding features in the marketplace to differentiate in competition, utilize new distribution channels to diversify products, expand and consumer credit development. Commercial banks need development cooperation with partners has many advantages in terms of customers, networks and technology, especially the cooperation with foreign banks to develop retail banking services, overseas remittance exchange... Besides diversifying products and services, raising the quality of banking services is a vital issue in the competitiveness of commercial banks. To improve the quality of services, banks should pay attention to measures such as: Improve the professional level, skills of exploiting the service, attitude to serve the staff of his staff and complete the business process.

The above-mentioned things, the next research should survey more than 200 staffs and managers of commercial banks in other provinces of Vietnam. This helps the data that is more significant. The study topic is very big area. The next research should survey more than 9 items in components affecting the service quality of commercial banks in Vietnam.

REFERENCES

Blanchet, Max; Rinn, Thomas; Thaden, Georg von; et al. (2014). *Industry 4.0. The new industrial revolution. How Europe will succeed*. Munich: Roland Berger Strategy Consultants.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

Cisco. (2011). *What is network security*?. Retrieved from cisco.com.
Daniels, J., Radebaugh, L., Sullivan, D. (2007). *International Business: environment and operations, 11th edition*. Prentice Hall. ISBN.
Ensher, E. A., Nielson, T. R., & Grant-Vallone, E. (2002). *Tales from the Hiring Line: Effects of the Internet and Technology on HR Processes*. Organizational Dynamics.
General Statistics Office (2007-2015). *Labor Force Survey*.
General Statistics Office (2016). *Labor Force Report of Vietnam: Current situation and solutions*.
Heneman III, Herbert; Judge, Timothy A (2005). *Staffing Organizations*. USA: McGraw-Hill. ISBN.
Hughes, Thomas P. (2004). *Human-Built World: How to Think About Technology and Culture*. Chicago: University of Chicago Press.
Jukka Ojasalo (2010). E-Service Quality: A Conceptual Model. *International Journal of Arts and Sciences*.
Kagermann, H., W. Wahlster and J. Helbig, eds., (2013). Recommendations for implementing the strategic initiative Industrie 4.0. *Final report of the Industrie 4.0 Working Group*.
Kaufman, Bruce E. (2008). *Managing the Human Factor: The Early Years of Human Resource Management in American Industry*. Ithaca, New York: Cornell University Press.
Lussier, R. N., & Achua, C. F., (2010). *Leadership, Theory, Application, & Skill Development. (4th ed)*. Mason, OH: South-Western Cengage Learning.
Markus Liffler; Andreas Tschiesner (2013). *The Internet of Things and the future of manufacturing | McKinsey & Company*. Mckinsey.com. Retrieved.
Merriam, S. (1998). *Qualitative research and case study applications in education*. San Francisco.
Ministry of Labor, Invalids and Social Affairs (2017). *Vietnam Labor Market Update Newsletter*. No. 12, Quarter IV / 2016.
Parasuraman, A., Valarie A. Zeithaml, and Arvind Malhotra (2005). E-S-QUAL A Multiple-Item Scale for Assessing Electronic Service Quality. *Journal of Service Research*.
Parasuraman, A.; Berry, Leonard L.; Zeithaml, Valarie A., (1991). *Understanding Customer Expectations of Service*. Sloan Management Review.
Shanka, Mesay Sata (2012). Bank Service Quality, Customer Satisfaction and Loyalty in Ethiopian Banking Sector. *Journal of Business Administration and Management Sciences Research*.
Shanka, Mesay Sata (2012). Measuring Service Quality in Ethiopian Airlines. *Journal of Educational and Social Research.*
Wright, Joe; Jim Harmening (2009). *Computer and Information Security Handbook.* Morgan Kaufmann Publications Elsevier Inc.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)