RIMCIS International and Multidisciplinary Journal of Social Sciences

Hipatia Press
www.hipatiapress.com

Instructions for authors, subscriptions and further details:

http://rimcis.hipatiapress.com

Performance of Banking Sectors Due to Adoption of Information Technology (IT)

Ajay Kumar Behera[1], Narayan C. Nayak[2] and Harish C. Das[1]

1) Siksha O Anusandhan University. India
2) Indira Gandhi Institute of Technology. India

Date of publication: March 30th, 2014
Edition period: March 2104 – July 2014

To cite this article: Behera, A.K., Nayak, N.C. and Das, H.C. (2014). Performance of Banking Sectors Due to Adoption of Information Technology (IT). *International and Multidisciplinary Journal of Social Sciences, 3*(1), 91-110. doi: 10.4471/rimcis.2014.30

To link this article: http://dx.doi.org/10.4471/rimcis.2014.30

RIMCIS – International and Multidisciplinary Journal of Social Sciences Vol. 3 No.1 March 2014 pp. 91-110

Performance of Banking Sectors Due to Adoption of Information Technology (IT)

Ajay Kumar Behera
Siksha O Anusandhan University

Narayan C. Nayak
Indira Gandhi Institute of Technology

Harish C. Das
Siksha O Anusandhan University

Abstract

The aim of this paper is to provide an analysis on the relationship between Information Technology (IT) usage, CRM and performance of bank (state bank group) in Bhubaneswar, Odisha, India. Most of the banks in INDIA are geared for comprehensive banking solutions with extensive branch networks. Empirical data collection was done in the year 2012 and analyzed with the theoretical data. A sample of 18 branches was selected using the non-probability sampling technique. Perceptions of branch managers, staff members and customers were collected using a survey method. All 18 branches selected are of an equivalent grade according to the grading set by the bank. Three different types of questionnaires were designed for branch managers, branch staff and customers. Both structured and semi structured questions were included in the questionnaires with 7 point likert scale. Using bivariate correlation and linear regression, data analysis was done. The linear relationship between variables was measured by using Pearson's correlation coefficient. The analysis suggested that IT usage has a positive linear relationship with financial performance and quality performance of bank branches. Bank performance was found to have a correlation with factors such as staff attitude towards IT usage, IT literacy level of bank staff and scope and complexity of the IT applications.

Keywords: Information technology usage, bank performance, quality performance, IT literacy level, financial performance

ISSN: 2014-3680
DOI: 10.4471/rimcis.2014.30

RIMCIS – International and Multidisciplinary Journal of Social Sciences Vol. 3 No.1 March 2014 pp. 91-110

Productividad del Sector Bancario Debida al Uso de Tecnologías de la Información (TI)

Ajay Kumar Behera
Siksha O Anusandhan University

Narayan C. Nayak
Indira Gandhi Institute of Technology

Harish C. Das
Siksha O Anusandhan University

Resumen

El objetivo de este artículo es proporcionar un análisis de la relación entre el uso de Tecnologías de la Información (TI), CRM y la productividad de los bancos (grupo estatal de bancos) en Bhubaneswar, Odisha, India. La mayoría de los bancos en India están diseñados para aplicar soluciones comprehensivas a partir de redes extensas de sucursales. La recolección de datos empíricos se hizo en 2012 y se analizó desde la teoría. Se seleccionó una muestra de dieciocho sucursales a partir de una técnica de muestreo no probabilístico. Mediante una encuesta se recogió la percepción de directores, personal y clientes de las sucursales. En los cuestionarios de escalas de Likert de siete puntos se incluyeron tanto preguntas estructuradas como semiestructuradas. El análisis se realizó en base a correlaciones bivariadas y regresiones lineales. La relación linear entre las variables se midió con un coeficiente de correlación de Pearson. El análisis sugirió que el uso de TI tiene relación lineal directa con la productividad financiera y con una productividad de calidad de las sucursales bancarias. Se halló que la productividad de los bancos correlaciona con factores cómo la actitud de los trabajadores hacia las TI, su grado de alfabetización en TI y el alcance y complejidad de las aplicaciones de TI.

Palabras clave: uso de tecnologías de la información, productividad de los bancos, grado de alfabetización en TI, productividad financiera, CRM

ISSN: 2014-3680
DOI: 10.4471/rimcis.2014.30

Introduction

Information Technology (IT) is fast becoming a dynamic channel that drives the Indian economy. IT is becoming increasingly important for the growth of our economy as a whole. The availability and usage of adequate IT skills are important factors, which influence the competitiveness among commercial banks in this era of e-Economy.

There are multiple factors which govern the performance of an organization. Of those, IT has a significant positive impact on the organizational performance (O'Mahony & Robinson, 2003). Growth and competitiveness of banks are dependent on the successful application of new technologies. Availability of skilled labor is a questionable resource requirement. There is a qualitative and quantitative imbalance in the supply of skilled labor. It depends on the demographic factors, business cycles and rapid technological advancements taking place around us. Due to the vast development in the area of e-Banking it is essential that the policy makers should focus on the growing demand in IT skills and take corrective steps to prepare the required numbers and quality beforehand. e-Banking enables to conduct banking business electronically over the Internet where the costs are minimal and it is no longer bound by time or geographical boundary.

How can the Indian banks keep abreast of these changes? How can the banks stay ahead and introduce next generation of banking products? The answers to these questions would be to have employees fluent in digital language and people who are innovative and creative. They should be capable in introducing new banking products and understanding the future banking needs of our society. This research provides information to the stakeholders of commercial banks to allocate required funds for the much-needed IT training on employees. Further, IT literacy level of the decision makers has a huge impact on the total customer satisfaction and thereby achieving growth in performance.

There were many constraints and hardships experienced by bank branches in the era of pre-IT usage. The total number of accounts handled manually by branches with the allocated staff members was limited. Hence the opening of new accounts was restricted in most of the high level

branches. Today there is no restriction as such and systems allow the opening of any number of accounts. Before the implementation of Automatic Teller Machines (ATMs) customers had to visit their own branch to withdraw cash. Anytime banking was not available. Unavailability of any-where banking features was due to the unavailability of ATM banking, Internet banking, SMS and phone banking. Branches were opened only during the specified time durations. Banking hours were restricted. Branch staff could not leave the branch until they balance their day's accounting. In some instances, balancing was extended to late nights. Daily balancing, month-end balancing and year-end balancing were tedious tasks to operational staff of the branch. Branches had to offer more restricted ban king hours during such periods.

If a customer wanted to withdraw money from his savings account, he had to fill a savings debit form, present it to the cashier, obtain a token and wait till the number is called. When the token number is called, he had to place the signature again on the same debit voucher confirming cash receipt from the cashier. Accordingly he had to visit the cashier at least twice to receive his own money. There were no single point transactions. Branch staff had to check signatures, mandates and ledger sheets and they need to make necessary entries manually before disbursing or after accepting cash from customers. There were long waiting queues at branches on special days when the branch staff could not handle the workload. Fund transfer between two accounts belonging to separate branches or banks was a complicated task and it took several days to effect the transaction. Reconciliation of main accounts took many days and they were usually two to three days behind. Extraction of past records was a task of searching through huge paper files and documents. But today, a customer can receive cash from the branch teller at the first appearance. Tellers are given authority to pay up to a higher level without seeking officers approval. Tellers can review all the information on-line using the teller terminals before taking decisions. Debit voucher forms are validated on- line using teller printers.

Customer advices and statements were type written. Even the balance inquiry was a complex task. Job expertise was a mandatory requirement to work at the branch. Customers were given lengthy account numbers as the

branch codes and ledger numbers were incorporated in account numbers for easy identification. There was no easy way to extract instant ad-hoc MIS reports for decision-making. There were no cashless shopping, marketing or holidaying. People had to carry cash with them. Credit cards and debit cards were not available.

Banks are spending huge sums of money in acquiring IT competence. They need to invest huge amounts in foreign currency for hardware, software and soft skills. Also they invest money to train bank staff and maintain and retain the group of knowledge workers. Do the banks gain the expected return on expenditure? Have they achieved the maximum value for the money spent? Do they have a specific plan to collect the return? Also, does the bank prepare its entire staff to accept IT challenges and innovations ahead?

The main objective of this research is to find out the impact of IT usage on bank performance. With respect to a leading commercial bank in India, this study attempts to measure the impact of IT usage on bank performance. It also tries to find out the level of IT usage at branches. Further the study attempts to explore the IT literacy level of banking staff.

The research was carried out within a set of sample branches belonging to state bank group involved in commercial banking business in Bhubaneswar, Odisha, India.

There are many factors governing the overall performance of banks. It is necessary to study all the factors and their effectiveness on the performance. In this era of e-Banking IT definitely plays a major role in performance. Almost all the banks in India geared with complex IT systems to handle core-banking functionalities. Branches use those functionalities provided by the central core banking applications. However, the usage of IT at the branch, other than the core banking application is to be studied. Also it is necessary to motivate and encourage branch managers and the staff to be equipped with IT skills to use IT in a broader way.

The results of this research will enable the banks to take corrective decisions on fund allocations for IT training of their staff. They can include alterations to the recruitment and promotion criteria to consider IT skill levels. This can result in making it a general requirement to acquire IT skills for employment in the banking industry. This will also create

awareness in the general public that it is important to acquire basic IT skills before seeking employment. Finally, it can contribute in turn to improve the IT literacy level of the general public.

If banks are willing to include IT literacy skills in the performance evaluation and promotion criteria, it will be an added motivation for the existing bank staff to acquire required IT skills. When the branch staff is IT literate, they can propose and suggest innovative banking products which align with banking business. It will be easy for the specialized IT staff to have fruitful discussions during policy reforms.

IT is a main factor which influences globalization. Globalization is a 'social process'. Various companies from different countries with different cultural values and ideas tend to converge together. Business and society as a whole rely heavily on IT. IT is a means to communicate data and valuable information that is used in organizational processes for crucial decision making. With the development of the Internet there is an increased opportunity enabling organizations to succeed financially (Jun & Cai, 2001). IT has become an essential resource to business activities due to the development of high bandwidth telecommunications networking, integrated distribution systems, and database systems that allow businesses to operate in a global way. IT enables communication between different companies via state-of-the-art technology, consisting of telecommunications equipments such as high-tech web cameras and ultra-fast networks, resulting in high-speed data transmission1.

Now that many firms around the world have taken to globalization through IT, it has caused an increase in competition. As a result there is a benefit to the consumer. The prices set on the Internet are frequently lower than the prices set in retail stores (Cui, Lewis, & Park, 2003). In the book 'The Search' (Dewhurst, Lorente, & Rodrigues, 2003) Battelle explained how the search engine 'Google' and its rivals changed the rules of traditional business and transformed our global culture.

Assessment of IT literacy means not just knowledge of technology, but the ability to apply technology to solve problems (Needle, 2006). Findings of an e-skills study of IT user skills in workplace in the UK demonstrated very bad gaps for employees. The study has found that many employees lacked sufficient IT user skills to perform effectively in their day-to-day

roles thus impacting negative business productivity (Oliver & Towers, 2000).

Aim of Customer Relationship Management (CRM) is to produce Customer Equity. Three major drivers of customer equity are: 1. Value Equity 2. Brand Equity 3.Relationship Equity

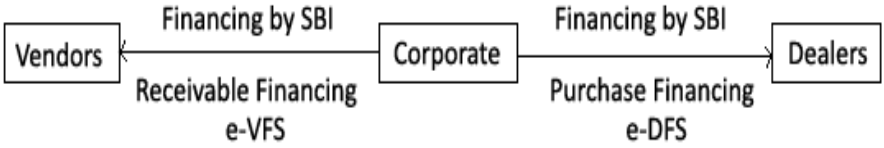

Figure 1. *Supply chain of SBI Finance*

Electronic Vendor Financing Scheme (e-VFS) and Electronic Dealer Financing Scheme (e-DFS) State Bank of India introduces Supply Chain Finance by leveraging its state of the art technology for the convenience of the customers. SCF will strengthen the relationship of SBI with the Corporate World by financing their supply chain partners. Under Supply Chain Finance Unit we have established an online platform for financing the Supply Chain partners of various reputed Corporate. The paper has established the relationship between CRM, IT usage & IT literacy level.

Dramatic changes are happening in financial products and services. Other than the traditional banking business of liquidity provision, banks have acquired competencies to perform variety of other financial and non-financial activities. Deregulation and innovation have opened up the financial sector. Bankers must ensure that they are ready for this technological change (Rockman, 2005).

The drive towards self-service and automated customer care has allowed organizations to reduce costs and handle an ever-increasing number of consumer transactions efficiently. However, the profile of end customer is ever changing. They are becoming mobile and not relying on a single communication device. Companies should grasp this and maintain a competitive edge. They should recognize the growing user-centricity of consumer communications (Berger, 2008).

The paradigm is shifting. The organizations that can move quickly to respond to this change can gain a bigger market share and reduce customer churn purely by enhancing the experience of customers who now expect anytime, anywhere access to services (Berger, 2008). A research carried out in the UK has used the "Growth Accounting Approach" to multi factor productivity estimation to estimate the impact of IT on productivity (O'Mahony & Robinson, 2003). Identification of suitable metrics to assess IT impact on business performance is a difficult task. Further work have to be carried out to determine whether measures such as IT usage, user satisfaction could be used as an indicator of business performance attributed to the use of IT in a competent and innovative way (Mutula & Brake, 2007).

There are many factors governing the performance of decision-making units that are to be considered in benchmarking (Mutula & Brake, 2007). Some of them can be listed as customer attitude towards IT usage, scope of IT applications used, level of IT service quality, IT security level, complexity of IT, unreliability of IT, job satisfaction of the staff, profitability, considering IT as a strategic tool, level of customer relationship management, customer satisfaction, cost reduction, operational efficiency and operating efficiency. A study done on comparison of service quality states that the IT usage on branch performance can be measured using the use of the Internet as a marketing intelligence tool, perceived usefulness and perceived ease of use, system quality (information quality), attitudes towards web retailing, compatibility, personality, working experience, educational level, Internet access availability, training received and frequency of use and trust (Rajan, 1996).

In a research done by Davis (Gaffney, 2007) in 1989 using the Technology Acceptance Model (TAM) as a basis, a questionnaire was completed by employees. Structural Equation Modeling (SEM) was used to analyze the data, and this confirmed the relationships proposed by the TAM (Gaffney, 2007). In that research, the TAM was modified and applied to bank customers in Estonia, because Estonia, a country with a developing economy, has focused on Internet banking as an important distribution channel. A total of 268 commercial bank customers responded to a Greek and Turkish translated version of the SERVQUAL (a multiple-item scale for measuring perceptions of service quality instrument) (Arasli, 2005).

Methodology

The research was carried out on quantitative design to measure IT usage level at branches. Interviews were carried out to collect data from key stakeholders in the banking sector who are also with IT expertise. Functionalities that the branch staff can perform using IT skills in order to increase the bank performance were analyzed by conducting interviews with industry experts. A sample set of branches were selected for the survey. Three types of questionnaires were prepared and distributed among the branch managers, staff and customers.

In order to measure the branch performance, the following channels were used to acquire data: Published data, Customer views, Interviews with veteran bankers, Interviews with bank staff, Results obtained from the questionnaire.

Branch performance was measured in two ways such as quality performance and financial performance. Based on the previous literature, those two performances were measured using multiple sets of variables as explained in Table 1.

Table 1.
Variables used to measure branch performance

Financial Performance (FP)	
1	Total deposits
2	Total advances
3	Branch profit
Quality Performance (QP)	
1	Customer attitude on branch performance
2	Customer complaints
3	Job satisfaction of the branch staff

Data analyzed and presented in descriptive and narrative forms using statistical methods and SPSS (Statistical Package for Social Sciences) and finally the impact of IT usage on bank performance was measured.

Table 2.
Variables used to measure IT usage at branches

IT Application (Application)	
1	Scope of IT applications
2	Availability of Internet
3	ATM availability
4	Level of e-mail communication
5	Level of office package usage
Attitude Towards IT (Attitude)	
1	Attitude of branch managers towards IT usage
2	Attitude of branch staff towards IT usage
3	Attitude of customers towards IT usage
IT Literacy Level (Literacy)	
1	IT literacy level of manager
	IT literacy level of branch staff
3	IT literacy level of customer

Results

Bank branch performance was the dependent variable in the study. It is measured in two ways such as financial performance and quality

performance of the branch. Independent variables are grouped under IT usage at bank branches. Independent and dependent variables used for the analysis are detailed in Tables 1 and 2.

Pearson's correlation analysis was used to identify the relationships of performance variables with IT usage variables to test the hypothesis. Results obtained are shown in the Tables 3, 4, 5, 6 and Table 7.

Table 3.
Correlation analysis between IT usage and increase in deposits

	Increase in deposits	Application	Attitude	Literacy
Increase in Pearson Correlation	1	0.461	518(*)	0.401
Deposits sig. (2-tailed)		0.054	0.028	0.099
N	18	18	18	18

*Correlation is significant at the 0.05 level (2-tailed)

Table 4.
Correlation analysis between IT usage and increase in advances

Variable	Pearson Correlation	Significance (2- tailed)
Increase in Deposits		
IT Application	0.461	0.054
Attitude towards IT	0.518(*)	0.028
IT literacy Level	0.401	0.099
Increase in Advances		
IT Application	0.459	0.055
Attitude towards IT	0.557(*)	0.016
IT literacy Level	0.557(*)	0.022
Increase in Profit		
IT Application	0.474(*)	0.047
Attitude towards IT	0.661(**)	0.003
IT literacy Level	650(**)	0.003
Quality Performance		
IT usage	727(**)	0.001

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Table 5.
Correlation analysis between IT usage and increase in profit

	Increase in deposits	Application	Attitude	Literacy
Increase in Pearson Correlation	1	0.474(*)	0.661(**)	0.650(**)
Deposits sig. (2-tailed)		0.047	0.003	0.033
N	18	18	18	18

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Table 6.
Correlation analysis between IT usage and increase in profit

Correlation Analysis Between IT Usage and Quality Performance		
	QP	IT Usage
QP Pearson Corre	1	0.727(**)
Sig.(2-tailed)		0.001
N	18	18

**Correlation is significant at the 0.01 level (2-tailed)

Hypothesis Testing

The following hypotheses were tested.

Hypothesis 1

"Higher the IT application at bank branch, higher the impact on increase in branch deposits". Correlation analysis showed that there is no strong relationship. Accepted H0, Rejected H1

Hypothesis 2

Greater the positive attitude towards IT, higher the impact on increase in branch deposits at the bank branch". Correlation analysis showed a positive relationship. Rejected H0, Accepted H2

Hypothesis 3

"Higher the IT literacy level of branch staff and customers, higher the impact on increase in bank branch deposits". Correlation analysis showed that there is no strong relationship. Accepted H0, Rejected H3

Hypothesis 4

"Higher the IT application at bank branch, higher the impact on increase in advances". Correlation analysis showed that there is no strong relationship. Accepted H0, Rejected H4

Hypothesis 5

"Greater the positive attitude towards IT, higher the impact on increase in advances at the bank branch". Correlation analysis showed a positive relationship. Rejected H0, Accepted H5

Hypothesis 6

"Higher the IT Literacy level of branch staff and customers, higher the impact on increase in bank branch advances". Correlation analysis showed a positive relationship. Rejected H0, Accepted H6

Hypothesis 7

"Higher the IT application at bank branch, higher the impact on increase in the branch profit". Correlation analysis showed a positive relationship. Rejected H0, Accepted H7

Hypothesis 8

"Greater the positive attitude towards IT, higher the impact on increase in Profit of bank branch". Correlation analysis showed a strong positive relationship. Rejected H0, Accepted H8

Hypothesis 9

"Higher the IT Literacy level of the branch staff and the customers, higher the impact on the increase in bank branch profit". Correlation analysis showed a strong positive relationship. Rejected H0, Accepted H9

Hypothesis 10

"Higher the IT usage level, higher the impact on Quality Performance improvement at the bank branch". Correlation analysis showed a strong positive relationship. Rejected H0, Accepted H10

Discussion

There is a significant positive relationship between the attitude of the branch staff plus customers towards the IT usage and the increase in bank performance. There is a weak positive relationship between the IT application and the increase in deposits. The relationship between IT literacy level of the staff and the customers and the increase in branch deposits is also weak. It is noted that this bank could use IT as a marketing intelligence tool to increase deposits.

The relationship between the increase in advances of the branch and the attitudes of the staff plus customers towards IT is significant. Increase in advances with the IT literacy level of staff and customers are also significantly related. However, the IT application has only a weak relationship with the increase in advances of branch. With the use of IT, it was possible to evaluate the customer credit worthiness in granting advances. However, according to the results it can be stated that this bank

was utilizing the power of IT to increase the loan and advance portfolio of the bank. They could get the advantages of data warehousing and data mining to evaluate customers and increase loan portfolio.

All three independent variables listed as IT application, attitude towards IT and IT literacy level have strong relationships with the dependent variable named as increase in branch profit. The relationship with attitude towards IT and IT literacy level is stronger. It is seen that the relationship between IT usage and quality performance of a branch is also significant. Branch staff is able to attend to customer needs in a better way as they could access customer information online. They could verify the signatures online. Total customer profile could be viewed with a single key stroke. IT has made the work easy for the branch staff.

The research study showed that there is a substantial influence of IT usage on the bank performance improvement. In conducting this research it was found that usage levels of IT in the branches differed significantly. Some branches were using IT in many of their business functions whereas in others the IT usage was limited to core banking applications. For example, some branches have not explored the possibility of using e-mail communication with customers to further improve customer service levels and reduce delays in correspondence.

Some of the causes of such differentiation are non availability of Internet and personal computers for the related staff, lack of IT knowledge and poor investments on IT at branch level. Some senior staff members were very comfortable with the way they practiced their work for past 10 to 15 years and not willing to accept changes. It was also stated that some personal computers were very slow in performance. Slowness in Internet browsing was also a concern. Some staff members were complaining about not having Internet access, because managers had the opinion that it is not possible to open Internet for all staff as it can have an adverse effect on normal work.

Conclusion

The analysis proved that the use of IT has a huge impact on the overall branch profit. Establishment of the core banking application system with on-line inter branch network covering most of the branches in Bhubaneswar has increased the convenience of customers. Anytime banking and anywhere banking has reduced customer visits to his/her own branch.

Most of the customers have not seen the web site of the bank. It is possible to have a display desktop at the reception counter of the branch with bank web site as home page for customer use. It is also necessary to address the issue of bank branch staff not having access to the Internet. Some staff members have not even accessed the web site of the bank.

The IT literacy level of the branch staff can be further improved and facilities should be available at the branch to use IT for branch work. Core banking application to be further strengthened to reduce staff time spent on routine work. Staff should be free to use IT for new avenues such as to enhance the deposit mobilization, the advance portfolio and recovery of non-performing loans.

From the research findings it was revealed that ATM usage is very popular among customers. However, customers are not happy with the level of ATM availability in the country. ATM locations are limited and it is not easy to find another ATM machine when the closest one is not functioning. Banks need to address this issue collectively. Banks can incorporate other functionalities like cash deposits and acceptance of clearing cheques via ATMs. It is necessary to amend and incorporate required legal policies pertaining to these functionalities in order to serve the customer. Bank branches are the critical decision making units of the bank. IT usage can be used to measure benchmark and identify low performing branches.

Future Work

In future, the entire bank branch networks in India will be equally equipped with latest IT functionalities. Hence the competition will lie on special

attention given to customers by his or her own branch and ultimately it will be the human relationship that will bring back customers and not the technology. It will be mainly the human connection, love and care of serving customers that will attract and retain customers to the branch.

References

Arasli, H. (2005). A comparison of service quality in the banking industry. Some evidence from Turkish- and Greek-speaking areas in Cyprus. *International Journal of Bank Marketing, 23*(7), 508-526.

Battelle, J. (2005). *The search. How Google and its rivals rewrote the rules of business and transformed our culture*. New York, NY: Penguin Group.

Berger, P. (2008). ICT Literacy Assessment. *Infosearcher*. Retrieved from http://infosearcher.typepad.com/infosearcher/2005/04/ict_literacy_as.html

Broderick, J.A., & Vachirapornpuk, S. (2002). Service quality of Internet banking: The importance of customer role. *Marketing Intelligence and Planning, 20*(6), 327-335. doi: 10.1108/02634500210445383

Cui, C.C., Lewis, B.R., & Park, W. (2003). Service quality in the banking sector in South Korea. *International Journal of Bank Marketing,21*(4), 191-201. doi: 10.1108/02652320310479187

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technologies. *MIS Quarterly, 13*(3), 319-340. doi: 10.2307/249008

Dewhurst, F.W, Lorente, A.R.M., & Rodriguez, C.S. (2003) An initial assessment of the influence of IT on TQM: a multiple case study. *International Journal of Operations & Production Management, 23*(4), 348-374. doi: 10.1108/01443570310467302

Ginige, H.R., & Samarasinghe, S.M. (2008). Impact of ICT on total quality mgt. *Proceedings of the 5th International Conference on Business Management*, Colombo.

Gaffney, A. (2007). Improving customer satisfaction through more effective ICT strategies. *TechZine, 1*(2). Retrieved from http://www3.alcatel-lucent.com/enrich/v1i22007/article_c3a2.html

Jun, M., & Cai, S. (2001). The key determinants of Internet bank service quality: A content analysis. *International Journal of Bank Marketing, 19*(7), 276-291.

Mutula, S.M., & Brake, P.V. (2007). ICT skills readiness for the emerging global digital economy among small businesses in developing countries. *Library Hi Tech, 25*(2), 231-245. doi: 10.1108/07378830710754992

Needle, D. (2006). *Business in context: An introduction to business and its environment, 4th edition*. Hampshire: Cengage Learning-Thomsons Learning.

O'Mahony, M.O. & Robinson, C. (2003). The growth of ICT and industry performance. *National Institute Economic Review, 184*(60). doi: 10.1177/002795010318400100 6

Oliver, R., & Towers, S. (2000). Benchmarking ICT literacy in tertiary learning settings. *ASCILITE 2000 Conference, A.S.F. Computers*, Australia. Retrieved from http://www.ascilite.org.au/conferences/coffs00/papers/ron_oliver.pdf

Rajan, R.G. (1996). Why banks have a future: Towards a new theory of commercial banking. *Journal of Applied Corporate Finance, 9*(2), 114-128. doi: 10.1111/j.1745-6622.1996.tb00119.x

Rockman, I.E. (2005). Editorial ICT literacy. *Reference Services Review, 33*(2),141-143. doi: 10.1108/00907320510597345

Wainwright, D.G.G.M., & Yarrow, D. (2005). Towards a framework for benchmarking ICT practice, competence and performance in small firms. *The International Journal for Library and Information Services, 6*(1), 39-52. doi: 10.1108/14678040510588580

Ajay Kumar Behera is Research Scholar in the Department of Mechanical Engineering at the Siksha O Anusandhan University (India)

Narayan C. Nayak is Professor in the Department of Mechanical Engineering at the Indira Ghandi Institute of Technology (India)

Harish C. Das is Professor in the Department of Mechanical Engineering at the Siksha O Anusandhan University (India)

Contact Address: Send direct correspondence to Ajay Kumar Behera, Plot nº 1501/1679, Khandagiri Bari, Bhubaneswar, Odisha, 751030, India. E-mail: mail2ajaybehera@yahoo.co.in