

Effects of Human Resource Information Systems on Human Resource Management Practices and Firm Performance in Listed Commercial Banks at Nairobi Securities Exchange

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Abstract

Globally, information systems have been adopted in various sectors of the economy. The trend is more entrenched in developed countries. Developing countries have adopted information systems in a lukewarm manner. Almost every task can be computerized, thereby making it very easy to accomplish various jobs. Human resource information systems are used to make the various human resource management practices easy to accomplish and consequently saving on time and costs. The systems can be used in recruitment and selection, training and development, HR planning, reward management and in performance management to mention but a few. This study sought to establish whether there is a link between the use of information systems in human resource practices and ultimately firm performance. Specifically, this paper looks at the influence of HRIS on training and development. The performance of a firm was looked at in its entirety in the sense that a balanced score card was employed to view all manifestations of performance of a firm. Kaplan and Norton in designing the balanced score card posited that performance of a firm can be determined by; financial measure, learning and growth of employees, customer satisfaction and internal business processes. All these aspects were used to find out whether there is a relationship between HRIS and the performance of a firm. The study was quantitative as well as qualitative in nature. Both primary and secondary data were used in this research. Secondary data was collected from the Capital Markets Authority. The data was in form of financial statements of listed companies from the year 2001 to 2011. Primary data was collected by the use of questionnaires and through interviews. Statistical Package for the Social Sciences (SPSS) software, descriptive and inferential statistics was used to analyze the data in this research.

Keywords: Human capital, Human resource information systems, Human resource planning and Information systems

1. Introduction

Information Technology has revolutionized the mode of conducting business all over the world. It is applied in virtually every sector of the world economy. It is used in healthcare, agriculture, manufacturing, service industries to mention but a few. With the upsurge of computerized management information systems (MIS) in industrialized countries' firms in the 1980s, HR functions increasingly started to deploy human resource information systems in their daily work. HRIS were primarily seen as MIS sub functions within HR areas intended to support the "planning, administration, decision making, and control activities of human resource management. The invention of Windows operating system prompted the birth of smaller software houses writing affordable, easily customizable, modular HRISs (Ball, 2001).

During the 1990s, along with the adoption of more complex HR practices focused on a company's overall performance goal, HRIS correspondingly evolved into more sophisticated information expert systems featuring analytical tools to support decision-making in managing human capital (Ostermann, Staudinger & Staudinger, 2009).

In HR planning process, it is easier to follow workforce gaps, the quantity and quality of the labour force and to plan future workforce requirements with the help of HR knowledge systems (Dessler, 2005). HRIS can support long range planning with information for labour force planning and supply and demand forecast for manpower. Staffing can be effectively done with information on equal

employment, separations and applicant qualifications; and development with information on training programs, salary forecasts, pay budgets and labour/employee relations with information on contract negotiations and employee assistance needs (Shibly, 2011). Risk and security management is another crucial function which can be derived by HRIS by following private and highly sensitive individual data and multiplatform security aspects which are perhaps the most serious factors that need to be taken into consideration when designing a human resource information system (Karakanian, 2000).

A HRIS can perform a number of functions from the simple storage and communication of information, to more complex transactions. As technology advances, the range of functions that an HRIS can undertake increases. Actually HRIS is directed towards the HR department itself (Ruël, Bondarouk & Looise, 2004), but the use of HRIS can provide a number of benefits not only to the HR function, but also line managers, and the wider organization (Parry, 2009). The use of HRIS has been advocated as an opportunity for human resource professionals to become strategic partners with top management. HRIS allow HR function to become more efficient and to provide better information for decision making (Beadles, Lowery & Johns, 2005). The increased use of web technology to deliver HR will leave HR specialists more time for strategic decision making and that outsourcing of people-management activities will liberate HR specialists to perform more strategic activities (Kulik & Perry, 2008). According to Ulrich (2009) as one of the strategic partners, the HR manager derives benefit from HRIS, to disseminate and execute the strategy within the organization. These systems enable employees to manage much of their own HR administrative work. They can take care of many routine transactions whenever they wish, because automated systems don't keep office hours.

In addition to their former operational role, HR professionals can also act as a competency manager by arranging the right people to the right positions in the right time with their new strategic architecture role (Gürol, Wolff & Ertemsir, 2010). HRIS is thought to contribute to overall business performance by fulfilling or at least supporting the tasks of data storage and retrieval, of serving as primary administrative support tools, of reporting and statistics as well as of program monitoring (Ostermann, Staudinger & Staudinger, 2009). HRIS plays an important role for any organization to effectively manage its human assets. Many organizations have adopted HRIS to assist their daily human resources operations. HRIS must align and satisfy the needs of the organization and its users in order to be successful (Noor & Razali, 2011).

However, HR departments need to recognize some of the current limitations of web technology and its integration to the HRIS backbone. Similar to most e-business ventures, security of private HR information is a top priority. Organizations looking seriously into Internet enabling of their HR businesses should evaluate the authentication, security, access rules, and audit trails related to service providers' networks, servers, and applications (Karakanian, 2000). The threat of hackers, malware and phishing is so real that if unattended the HRISs will come down crumbling. There also can be undesired and unexpected consequences of HRIS. Undesired consequences refer, for instance, to an increase of quantity but a decrease of quality of applicants in e-recruiting (Strohmeier, 2009). Another important aspect of using information systems is user satisfaction. It is often suggested as an indicator of IS success. Many IS empirical researchers have regarded user satisfaction as important proxy of IS success and it is the most employed measure of IS success due to its applicability and ease of use.

Globalization, rapid technological advancement, the move towards a knowledge-based economy and a host of other trends are changing the face of the modern organization and having a major impact on the role of the human resources (HR) department (Park, Gardner & Wright 2004). Successful adoption and implementation of innovations within the HR department to deal with these challenges and opportunities can be critical determinants of organizational success. An important innovation within the human resources management (HRM) function is the use of information technology (IT), which has led to the development of computer-based human resources information systems (HRIS).

In many organizations, the focus of the HRIS is on administrative efficiency. However, as organizations seek to grow and compete in the rapidly evolving knowledge-based economy, the pressure continues to grow for HR to play a more strategic role in the organization (Sheehan, Holland & De Cieri 2006). The growing link between HR and business strategy has organizations looking to their HR professionals for innovative programs and practices to build a more competitive workforce.

It is time to say "goodbye" to the golden age of transactional HRIS and software – payroll and benefits (Sommer, 2006) and "hello" to the new age of strategic HRIS and software performance management, succession planning, competency based compensation and workforce analytics (Greengard, 2005). As HR aims to transform to a more efficient and strategic function, it must learn how to leverage technology and use it as a competitive advantage. If strategy is the real driver behind technology, HR Managers actively pursuing a global strategy will be able to guide the organization, the system and the vendors to create new solutions.

Systems have continued to evolve over the years and more sophisticated HRISs are being developed. New solutions have lately been developed to identify and manage talent. The use of Human Resource

Information Systems and by extension workforce analytics has been used in critical talent management (Harris et al, 2011). Companies can use analytics to identify key segments of employees. Statistical analysis of good data yields useful segmentation – of employees, workforces, talent pools, or key skills. For example, analytics can be used to systematically and rigorously identify critical talent (such as key recruiting targets, high-potential employees and top performers). Companies make a whole range of investments aimed at finding, keeping, engaging and training the people who work for them. An analytical approach to these investments can help organizations discover which ones generate the biggest performance payoffs – and to use that knowledge to focus their talent investments.

Recent human Resource information system simulations have also been used to even predict future performances of employees (Harris et al, 2011). It is only a handful of firms which have embraced this level of HRISs. Workforce analytics module in Human Resource Information Systems can be used to give crucial information about return on investment on employees. All this information allows for proper decision making in an organization.

In Kenya, ICT has been widely used in Human Resource information systems from the late 1960's. The technology has changed with time. In the 1960's, it was the main frame type which was used in processing the payroll and Government accounts. In the late 1970's and early 1980's, it was the microcomputers which were used in word processing. Client servers came into use in the 1990's and were used in information sharing and online transactions. (Wachira, 2010). ICT has been used in organizations to add value in transactions by improving the efficiency of transactional services, back office and the production time of staff and in offering choice of delivery channels from face-to-face, online or through telephone. It adds value in interactions by maximizing the use of ICT technologies such as Internet, Intranet, emails, telephones, teleconferencing etc. and in Information sharing through building IT systems with technology that enables information to be shared across departments which means citizens or customers can receive a faster and more transparent service (Wachira, 2010). This shows that even though there has been use of HRIS, most organizations in Kenya engage the use of human resource information systems to carry out very mundane tasks at a very basic level.

In their seminal paper titled "New Directions in the Management of Human Resources in Africa" in 2012, Kamoche *et al.* argue that researchers constantly lament about the challenges of doing business in Africa, pointing to problems like poor infrastructure, corruption, ethnic chauvinism and so forth. They continue to say that, these problems of course continue to pose a challenge to economic rejuvenation, employment creation, poverty alleviation and improvements in living standards. However, they conclude that there is no denying that Africa is now generating enviable success stories across a wide range of sectors. Examples include Safaricom in Kenya that revolutionized mobile telephony, the Azalai hotel chain based in Mali, the Dangote conglomerate based in Nigeria, South African Airways and many others. Some of these successes have been reported widely in the media, including magazines such as *The Economist*. However, there has not been a matching academic interest in the form of exemplary case studies and journal articles in order that the relevant 'best practices' can be disseminated, taught and discussed, and brought into the mainstream as learning and research opportunities, the authors conclude. This study will address this research gap.

2. Statement of the Problem

A lot of literature has predominantly focused on the impact of HRIS in organizations (Alcázar et al. 2005; Browning et al.2009; Rodríguez & Ventura 2003). It takes HRIS in organizations for granted with relatively little systematic attention being paid to the issues that surround their adoption. Yet, adopting HRIS can be challenging as it can be costly and it can take a long time before espoused pre-adoption benefits become available after HRISs are fully adopted (Ashbaugh & Miranda 2002). To date, HRIS adoption remains under-researched both in public and private sectors, and therefore, addressing it can provide a valuable contribution to both research and practice (Blount & Castleman 2009; Henriksen & Mahnke 2005). Also, research has shown that most organizations still appear to use technology merely to automate routine administrative tasks (Ball, 2001; Groe, Pyle & Jamrong, 1996; Kinnie & Arthurs, 1996; Yeung & Brockband, 1995). This does not help leverage on the huge benefits of HRIS. If properly used, HRIS can transform how business is carried out in organizations and ultimately improve efficiency and profitability of a firm.

Phases of adopting HRIS have been classified into three stages (Kovach & Cathcart, 1999). The first phase is the operational impact of IT of automating routine activities, alleviating the administrative burdens, reducing costs, and improving productivity internal to the HR function itself. The second phase, after the operational impact of IT is the relational impact, it is providing managers and employees' remote access to HR databases and services, reducing response times, and improving service levels. Finally, the transformational phase of Information Technology is the redefinition of the scope and function of the HR organization to focus more on strategic issues. Many organizations use HRIS up to a very basic level. They use it only for operational, administrative duties. Some use it at the relational level but very few use it at the transformational level.

Listed companies at the Nairobi Securities Exchange (NSE) are very competitive and their Human

resource managers should be at the fore front to ensure that HRIS is adopted and used optimally in their organizations so that they can leverage on its benefits. However, there is scanty research done in Kenya, to establish the relationship between human resource information systems and firm performance. The study will focus more on companies listed at NSE. The listed companies are very competitive and the pressure for them to remain profitable by the stakeholders makes them leverage on information systems. The objective of this research is to investigate the factors affecting the success of HRIS adoption in the listed companies at the Nairobi Securities Exchange and how the use of HRIS, strategically and positively impacts on firm performance.

3. Purpose of the Study

The purpose of this study is to establish the relationship between human resource information systems use in training and development and its effect on firm performance with regard to listed companies at the Nairobi Securities Exchange. The specific objectives of the study were to establish to what extent does HRIS (Human Resource Information Systems) affects training and development and hence performance.

4. Literature Review

This research has the following underpinned theoretical foundations:

4.1 Resource Based View Theory

How information technology can help improve firm performance is an important research issue in information systems research. The resource-based view (RBV) proposed by Wernerfelt in 1984 is a major theory that has been adopted to analyze the issue. The basic argument of RBV is that firm performance is determined by the resources it owns. When RBV is applied to analyze the effect of information technology (IT), IT is considered an organizational resource that can enhance organizational capabilities and eventually lead to higher performance.

When RBV is applied to analyze the value of IT, information systems are usually considered to be a type of resources. Barney (1991) argues that organizational resource that can create advantage must have the following attributes: (i) Valuable (the resource can enable a firm to conceive or implement strategies that improve its efficiency or effectiveness), (ii) Rare (the resources should not be possessed by a large number of competing firms), (iii) Imperfectly Imitable (the resources should not be easily imitated due to unique historical conditions, causally ambiguous, or social complex) and (iv) Non-Substitutable (The resource should not be easily replaced by other substitutes).

In addition to financial indicators, many researchers also use indicators for measuring efficiency improvement such as productivity (Zhu, Kraemer et al. 2004; Zhuang and Lederer 2006), cost reduction (include COG/S, SGA/S and so on) (Zhu and Kraemer 2002; Ranganathan, Dhaliwal et al. 2004; Banker, Bardhan et al. 2006; Wang, Tai et al. 2006) to examine the impact of IS on the operational efficiency of a firm. There are other special indicators being used in certain circumstances such as customer satisfaction (Devaraj and Kohli 2000; Ranganathan, Dhaliwal et al. 2004; Ray, Muhanna et al. 2005), and market share (Sircar, Turnbow et al. 2000; Byrd and Davidson 2003).

Wade and Hulland (2004) included industrial factors as moderating variables towards choice of IS resources as inside out or outside in. The factors were environmental munificence, environmental turbulence and complexity. Restricting resource based view to only firm level variables will only give a restraining picture. The reason is IS resources usually span across organizational boundaries and thus become more sensitive towards being exposed to the dynamism of discontinuous and cataclysmic environmental changes. Bhatt and Grover (2005) measured three types of capabilities that could be linked to IT resources. They are creating value, competitive summary capabilities, and dynamic capabilities. While value strictly deals with creating and sustaining competitive advantage, competitive capabilities views the organization as an entity within the greater ecosystem, where the capabilities of IT resources spans across organizational boundaries. And dynamic capabilities mention the organizations competence to renew itself against environment.

4.1.1 Resource Based view in context of Information Systems

Mata, Fuerst, and Barney (1996), extended Barney's (1991) work and superimposed the resourced based analysis and studies of the capabilities of IT as a resource in creating sustained competitive advantage. In other words they developed the resource based model, identified some attributes of IT as a resource and mentioned if they are source of sustained competitive advantage. They identified that early literature lined sustainable advantage can be reached through deployment of IT by locking customers.

Mata et al. however, argued that firms cannot gain advantage by playing games with customers. They will sooner or later find a better substitute or another supplier could find opportunity by offering improved services. Further, they mentioned that since Information Technology can easily be duplicated, like any other resources, it will not create any value that is sustainable competitively. The four attributes they studied as possible sources of sustained competitive advantage are; access to capital, proprietary technology, technical IT

skills and IT managerial skills. They found that access to capital is not a source of sustainable competitive advantage, because capital can be raised through numerous means. Similarly, diffusion of IT and expiration of patents, and gradual commonality makes IT quite easily imitable, making it diverge from being a prerequisite to sustained competitive advantage.

The mobility of technical IT skill shows that such skills are explicit and easily codifiable, and thus cannot generate competitive advantage. IT managerial skills, which are a skill that is very tacit by nature, developed through years of understanding or realizing the ability of IT and requirements of business can become a source of sustained competitive advantage according to the researchers.

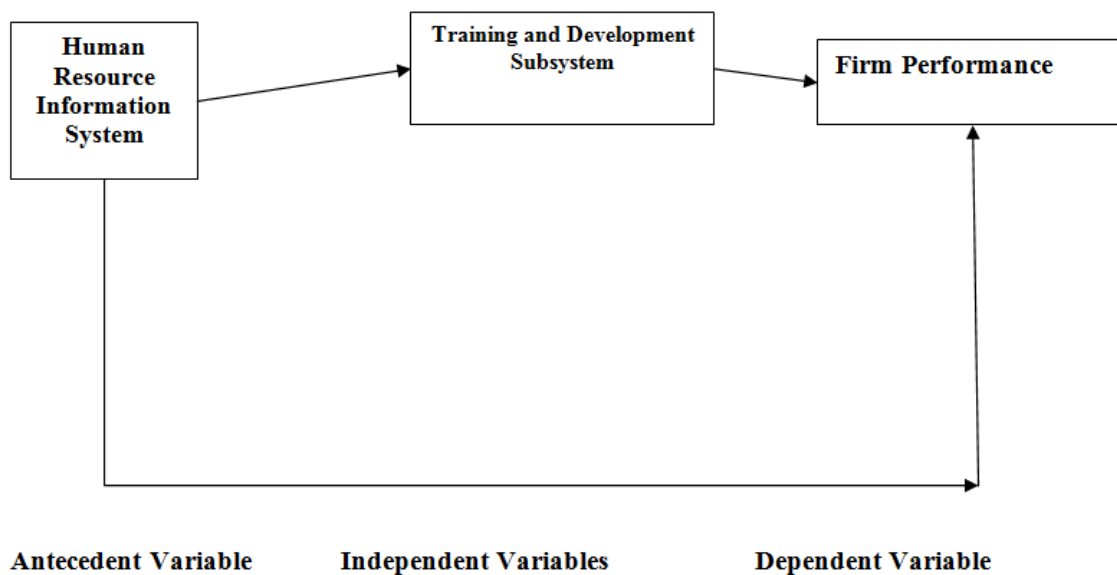
Bharadwaj (2001) linked the IT capability with firm performance. IT capability according to her is the ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities. She classified IT resources into three categories: Firstly, IT infrastructure: This is simply the physical IT infrastructure that forms the core of the firm's IT assets. She criticized Mata et al.'s (1996) work that IT per se cannot be a source of sustained competitive advantage. She mentioned that such view is nothing but reductionist that seeks to value the infrastructure solely in terms of individual components, ignoring the synergistic view of benefits from integrated systems. The author compares integrated versus non-integrated IT and mentioned that the non integrated category constrains an organization's choices and clearly has little impact on a firm's overall performance.

Secondly, human IT resources: It comprises both Technical and managerial skills. She agreed with Mata et al.'s view that managerial skills are tacit in its nature and cannot be codified. Some of the core functions of the Human IT resources were: integrate IT with business planning processes more effectively, develop reliable and cost effective applications that support business needs of the firm faster than competition, communicate and share work with other business units more efficiently, and anticipate future business needs of firm, innovate valuable new product features before competitors. Thus we see that it is from the Human IT resources that IT can start to become imperfectly imitable by making the link between resource and performance ambiguous and through sharing and collaboration construction of a socially complex procedure.

Thirdly, IT enables Intangibles: Citing Brynjolfsson and Hitt (1998), Bharadwaj mentions that usage of IT can result in improved customer service, enhanced product quality, increased market responsiveness and better coordination between buyers and suppliers. The author integrates research findings and classified the Intangibles in three categories: customer orientation (IT-enabled relationship management through CRM), development of knowledge assets and synergy, that that is ability to collaborate and among departments (groupware systems).

All these researchers use resource based view theory to show how information systems are used to improve firm performance. They have not investigated how it affects human resource practices though. This study will tackle this aspect.

Conceptual Framework



5. Research Methodology

This study adopted a descriptive research design. The target population of this study was all the commercial banks listed at the Nairobi Securities Exchange (NSE) in Kenya. The total number of listed banks at the NSE is

10 and quota sampling was deployed to get 50 % of the 10 banks to get a sample of 5 banks. Human resource managers were targeted for this study in these commercial banks. Purposive sampling was used to get the sample of 5 respondents from the population of 10, that is, one respondent in each bank that was in the sample. Self-administered questionnaires were used to back up the secondary data collected from the Capital Markets Authority Kenya which is the regulating body.

6. Findings

Effect of Human Resource Information Systems on Training and Development and firm performance in companies listed at NSE

Findings of the study revealed that human resource information systems affected training and development and firm performance at NSE listed companies to a high extent as shown by 73%.

On the extent to which respondents agreed with various HRIS training and development issues, majority of the respondents felt that utilizing training resources to the best advantage, companies must put a fair amount of effort in training needs assessment as shown by a mean of 4.6 and a standard deviation of 0.7958; that training and development is concerned with ensuring that the organization has the knowledgeable, skilled, engaged and committed workforce it needs, shown by a mean of 4.6 and a standard deviation of 0.7958; that for the training investment to pay-off, it should be carefully designed and implemented and linked to organizational goals and strategy as shown by a mean of 3.8 and a standard deviation of 1.0086; that the training approach is continuous, systematic and strategy oriented as shown by a mean of 3.5 and a standard deviation of 0.6323 and that the training and development function is essential for changing of behaviour and culture and reinforcing the new behaviour and culture as shown by a mean of 2.7 and a standard deviation of 0.6880

Linear regression model for Human Resource Information Systems and Training and Development

The linear regression analysis models the relationship between the dependent variable which is Human Resource Information Systems and independent variable which is training and development. The antecedent variable was HRIS. The coefficient of determination (R^2) and correlation coefficient (R) shows the degree of association between the various training and development practices and Human Resource Information Systems in companies listed at the Nairobi Securities Exchange (NSE). The results of the linear regression indicate that $R^2=0.593$ and $R= 0.771$. This is an indication that there is a strong linear relationship between Human Resource Information Systems and training and development in companies listed at the Nairobi Securities Exchange (NSE).

This implies that an increase in Human Resource Information Systems adoption leads to an increase in training and development.

Model of Human Resource Information Systems and Training and Development

Model Summary

R	R Square
.771	.593

The independent variable is Managerial Skills

The table above shows the results of ANOVA test which reveal that Human Resource Information Systems have a significant effect on training and development. The p-value was 0.002 which is less than 5% implying that the model is reliable to predict the influence of Human Resource Information Systems on training and development and hence performance

The linear regression model is therefore $Y=B_0+B_1X_1+E$ where X_1 is HRIS while Y is training and development.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1725.922	1	431.480	18.899	.002 ^b
	Residual	136.987	8	22.831		
	Total	1862.909	9			

a. Dependent Variable: Training and development

b. Predictors: (Constant), Human Resource Information Systems

Findings as indicated in table 3 below shows that there was positive gradient which reveals that an increase in the adoption of Human Resource Information Systems leads to increased training and development and hence firms performance

Model

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	3.332	.165		.000
	Human Resource Information Systems	.072	.036	.145	.009

A correlation matrix was also obtained establish the relationship between training and development and various aspects of firm performance, which included FINANCIAL PERFORMANCE (X1), CUSTOMER SATISFACTION (X2), REDUCED SERVICE TIME (X3) AND REDUCED CUSTOMER COMPLAINS (X4) Y was the TRAINING AND DEVELOPMENT VARIABLE

Correlations

		Y	X1	X2	X3	X4
Y	Pearson Correlation	1	.836**	.454	.647*	.764**
	Sig. (2-tailed)		.001	.161	.031	.006
	N	11	11	11	11	11
X1	Pearson Correlation	.836**	1	.223	.239	.671*
	Sig. (2-tailed)	.001		.510	.478	.024
	N	11	11	11	11	11
X2	Pearson Correlation	.454	.223	1	.711*	.332
	Sig. (2-tailed)	.161	.510		.014	.318
	N	11	11	11	11	11
X3	Pearson Correlation	.647*	.239	.711*	1	.428
	Sig. (2-tailed)	.031	.478	.014		.189
	N	11	11	11	11	11
X4	Pearson Correlation	.764**	.671*	.332	.428	1
	Sig. (2-tailed)	.006	.024	.318	.189	
	N	11	11	11	11	11

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

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

From the findings, training and development had a strong positive correlation with the financial performance of the banks as shown by a correlation coefficient of 0.836.

Findings also revealed that training and development was also strongly correlated to the number of customer complains, service time, and customer satisfaction. This was shown by Pearson correlation coefficients of 0.764, 0.647, and 0.454.

Correlation coefficients between the variables were ignored since correlation does not always indicate causality.

7. Conclusions and Recommendations

Based on the above findings, the study concludes that human resource information systems affect training and development and firm performance at NSE listed companies to a high extent; that utilizing training resources to the best advantage, companies must put a fair amount of effort in training needs assessment; that training and development is concerned with ensuring that the organization has knowledgeable, skilled, engaged and committed workforce it needs; that for the training investment to pay-off, it should be carefully designed and implemented and linked to organizational goals and strategy; that the training approach is continuous, systematic and strategy oriented and that the training and development function is essential for changing of behaviour and culture and reinforcing the new behaviour and culture. The findings indicate strongly that training which is integrated in the human resource information systems has a greater impact since the employees can easily access it in their own opportune times. This ensures that employees can attain skills to develop themselves any time. Overall, the findings revealed that there is a strong linear relationship between Human Resource Information Systems and training and development in companies listed at the Nairobi Securities Exchange (NSE).

In light of these observations, the study recommends that since there is a strong linear relationship between Human Resource Information Systems and training and development in companies listed at the Nairobi Securities Exchange (NSE), the management of the banks should keep up with emerging trends in Human Resource Information Systems. This will help to impact positively on human resource development and ultimately greater firm performance.

8. Areas for further Research

Since this study concentrated on the effects of human resource information systems on human resource management practices and firm performance in listed Commercial Banks at Nairobi Securities Exchange, it cannot be conclusive to say that Human Resource Information Systems and training and development in all companies are always in a linear relationship.

To this end, further research should be launched in other types of companies listed in the Nairobi Securities Exchange, to establish if the same findings hold.

References

- Ashbaugh, S., & Miranda, R. (2002). Technology for Human Resources Management: Seven Questions and Answers, *Public Personnel Management*, 31(1).
- Ball, K. S. (2001). The use of human resource information systems: a survey. *Personnel Review*, 30(5/6): 677-693.
- Ball, K. S. (2001). The Use Of Human Resource Information Systems: A survey. *Personnel Review*, 30(6).
- Banker, R. D., I. R. Bardhan, et al. (2006). "Plant Information Systems, Manufacturing Capabilities, and Plant Performance." *MIS Quarterly* 30(2): 315-337.
- Barney, J. B., & Wright, P. M. (1998). On becoming a strategic partner: The role of human resources in gaining competitive advantage. *Human Resource Management*, 37(1): 31-46.
- Beadles, N. A., Lowery, C. M., & Johns, K. (2005). The Impact of Human Resource Information Systems: An Exploratory Study in the Public Sector. *Communications of the IIMA*, 5 (4).
- Bharadwaj, A. S. (2000). "A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation." *MIS Quarterly* 24(1): 169.
- Bharadwaj, A. S. (2000). A Resource Based Perspective on Information Technology Capability and firm performance: An Empirical Investigation. *MIS Quarterly*, 24(1).
- Bhatt, G., & Grover, V. (2005). Types of Information Technology Capabilities and Their Role in Competitive Advantage: An Empirical Study, *Journal of Management Information Systems*, 22(2).
- Blount, Y., & Castleman, T. (2009). *The Curious Case of The Missing Employee In Information Systems Research*. Proceedings of the 20th Australasian Conference on Information Systems, Monash University, Melbourne, Australia.
- Brynjolfsson, E., & Hitt, L. (1998). Information Technology and Organizational Design: Evidence from Microdata. *MIT, Sloan School of Management Working Paper*.
- Dessler, G. (2005). *Human Resource Management*, (10th ed). New Jersey: Prentice Hall.
- Devaraj, S. and R. Kohli (2000). "Information Technology Payoff in the Health-Care Industry: A Longitudinal Study." *Journal of Management Information Systems* 16(4): 41-67.
- Greengard, S. (2005). Putting it All Together. *Workforce Management*, 83(11).
- Groe, G. M., Pyle, W., & Jamrong, J. (1996). Information Technology and HR. *Human Resource Planning*, 19(1).
- Gürol, Y., Wolff, A., & Ertemsir Berkin, E. (2010). E-HRM in Turkey: A case study. In I. Lee (Ed.). *Encyclopedia of E-Business Development and Management in the Global Economy*.
- Harris, E. C., & David A. L. (2011). Talent and analytics: new approaches, higher ROI, *Journal of Business Strategy*, 32(6).
- Henriksen, H.Z., & Mahnke, V. (2005). E-procurement Adoption in the Danish Public Sector. *Scandinavian Journal of Information Systems*, 17(2).
- Karakanian, M. (2000). Are human resources departments ready for E-HR? *Information Systems Management*, 17(4).
- Kinnie, N. J., & Arthurs, A. J. (1996). Personnel Specialists' Advanced Use of Information Technology: Evidence and Explanations. *Personnel Review*, 25(3).
- Kovach, K. A., & Cathcart, C. E. (1999). Human resource information systems (HRIS): Providing business with rapid data access, information exchange, and strategic advantage. *Public Personnel Management*, 28(2), 275-282.
- Kovach, K. A., & Cathcart, C. E. (1999). Human Resource Information Systems (HRIS): Providing Business With Rapid Data Access, Information Exchange, and Strategic Advantage. *Public Personnel Management*, 28(2).
- Kulik, C. T., & Perry, E. L. (2008). When Less is More: The effect of devolution on HR's Strategic Role and Construed Image. *Human Resource Management*, 47(3).
- Mahmood, M. A. and G. J. Mann (1993). "Measuring the organizational impact of information technology investment: An exploratory study." *Journal of Management Information Systems* 10(1): 97.
- Mata, F.J., Fuerst, W. L., & Barney, J. B. (1995). Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis. *MIS Quarterly*, 19(4).

- Noor, M. M., & Razali, R. (2011). Human Resources Information Systems (HRIS) for Military Domain-A Conceptual Framework. *International Conference on Electrical Engineering and Informatics, 17–19 July, 2011, Indonesia.*
- Ostermann, H., Staudinger, B., & Staudinger, R. (2009). *Benchmarking human resource information systems.* In T. Coronas & M. Oliva (Ed.), *Encyclopedia of Human Resources Information Systems: Challenges in E-HRM.* Hershey, PA: IGI Global.
- Park, H. J., Gardner, T. M., & Wright, P. M. (2004). HR Practices or HR Capabilities: Which Matters? Insights from the Asia-Pacific Region. *Asia-Pacific Journal of Human Resources, 42(3).*
- Ranganathan, C., J. S. Dhaliwal, et al. (2004). "Assimilation and Diffusion of Web Technologies in Supply-Chain Management: An Examination of Key Drivers and Performance Impacts." *International Journal of Electronic Commerce 9(1): 127-161.*
- Ray, G., Muhanna, W. A., & Barney J.B.(2005). Information Technology and the Performance of the Customer Service Process: A Resource-Based Analysis. *MIS Quarterly, 29(4).*
- Ray, G., W. A. Muhanna, et al. (2005). "Information Technology And The Performance Of The Customer Service Process: A Resource-Based Analysis." *MIS Quarterly 29(4): 625-651.*
- Ruël, H., Bondarouk, T., & Looise, J. K. (2004). E-HRM: Innovation or Irritation. An Explorative Empirical Study in Five Large Companies on Web-based HRM. *Management Revue 15(3).*
- Segars, A. H., & Grover, V. (1993). Re-Examining Perceived Ease Of Use and Usefulness: A Confirmatory Factor Analysis. *MIS Quarterly, 17(4).*
- Sheehan C., Holland, P., & De Cieri, H. (2006). Current Developments in HRM in Australian Organizations. *Asia Pacific Journal of Human Resources, 44(2).*
- Shibly, H. (2011). Human Resources Information Systems Success Assessment: An Integrative Model. *Australian Journal of Basic and Applied Sciences, 5(5).*
- Sommer, B. (2006), *Divergence or Alignment: State of HR and HR Technology.* Boston, MA: IHRIM Global Conference.
- Strohmeier, S. (2009). Concepts of E-HRM Consequences: a Categorization, Review and Suggestion. *International Journal of Human Resource Management, 20(3).*
- Wachira F.N (2010). Improving the Management of Human Resources in the Public Service through application of Information and Communication Technologies (ICTs). *Capacity Building Workshop for Public Sector Human Resource Managers in Africa on Strengthening Human Resource Capacities for the Achievement of the Millennium Development Goals and Africa's Development Cotonou, Republic of Benin – 12 to 16 April 2010*
- Wade, M., & Hulland, J. (2004). The Resource Based View and Information Systems Research: Review, Extension and Suggestion for Future Research. *MIS Quarterly, 28(1).*
- Wright, P.M., McMahan, G.C., & McWilliams, A. (1994) 'Human Resources and Sustained Competitive Advantage: A Resource-based Perspective', *International Journal of Human Resource Management, 5:* 301–26.
- Yeung, A., & Brockbank, W. (1995). *Reengineering HR through information technology. Human Resource Planning, 18(2), 24-37.*
- Yeung, A., & Brockbank, W. (1995). Reengineering HR Through Information Technology. *Human Resource Planning, 18(2).*
- Zhu, K. & K. L. Kraemer (2005). "Post-Adoption Variations in Usage and Value of E-Business by Organizations: Cross-Country Evidence from the Retail Industry." *Information Systems Research Journal 16(1): 61-84.*
- Zhu, K., K. L. Kraemer, et al. (2004). "Information Technology Payoff in E-Business Environments: An International Perspective on Value Creation of E-Business in the Financial Services Industry." *Journal of Management Information Systems 21(1): 17-54.*