The Adoption and Use of Human Resource Information System (HRIS) in Ghana

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Abstract: The study looked at the adoption of Human Resource Information System (HRIS) among Ghanaian firms. A survey was conducted on 129 firms out of the 150 samples randomly selected from both the public and the private sectors in the country with a response rate of 86%. The findings first revealed that the adoption rate of HRIS in enterprises is not a common practice in Ghana since two-thirds of the organizations have never adopted HRIS use. Major general denominators for adoption and use of HRIS include firm size, organization type (i.e. profit making limited liability companies and profit making government organization) and age as well as the industry to which firms belong. Firms attributed the slow rate of adoption to reasons including the low numbers of employees, high cost of system installation, unawareness and low priority for such a system. Again, it was realized that the companies' readiness to adopt such a system was not encouraging. There were some technical, organizational and environmental factors that affect HRIS adoption which were unearthed.

1 INTRODUCTION

Business effectiveness and organizational efficiency, performance and profitability have increasingly been dependent on Information Technology (Ball, 2001; Lippert and Swiercz, 2005; Troshani et al., 2010; Yusoff et al., 2010). Information Technology (IT) has provided the enabling innovative environment which has assisted HR professionals to provide efficient and effective service (Hendrickson, 2003). The shift is partially attributed to emergent technologies such as Human Resource Information System (HRIS) also known as Electronic Human Resource Management (e-HRM) which consists of systematic procedures and functions for acquiring, storing, manipulating, retrieving, analyzing and disseminating pertinent information concerning organization's HR (Lippert and Swiercz, 2005). An HRIS is a set of interrelated components working together to collect, process, store and disseminate information (Dessler, 2011), to support decision making, coordination, control, analysis and utilization of an organization's Human Resource Management (HRM) activities.

Gueutal and Stone (2005) acknowledged the use of technologies for HRM practices and policies as maturing within organizational life. However, academic involvement in HRIS started relatively late and is still trying to catch up with practice (Stanton and Coovert, 2004; Townsend and Bennett, 2003; Viswesvaran, 2003). Again, HRM (Absar and Mahmodd, 2011) and IT have drawn the attention of researchers (Saleem et al., 2011), industry and academia, nevertheless linkage between the two disciplines is still at cutting edge and need more exploration (Mishra and Akman, 2010) especially in developing economies. Despite these signs of a growing academic interest (Gueutal and Stone, 2005) with correspondent growth in literature, there is a broad agreement that research in the area of HRIS adoption is inadequate (Henriksen and Mahnke, 2005; Blount and Castleman, 2009; Troshani et al., 2010), especially the discriminating factors determining HRIS adoption in developing countries (Strohmeier and Kabst, 2009; Sateem, 2012; Chen, 2014).

Surveys of HR consultants posit that the number of organizations adopting HRIS within organizations elsewhere in Europe and other advanced economies were continually increasing (CedarCrestone, 2005; Strohmeier and Kabst, 2009). It is estimated that about two-thirds of all organizations of developed

nations such as the United States are far ahead in the adoption of HRIS (Palvia et al., 2002; Strohmeier and Kabst, 2009), but the situation is different with newly industrializing and developing nations (Thong, 1999). Research on adoption of HRIS is still in its "youthful phase" especially in Africa. Developing economies like Ghana are slowly adopting technological innovation including HRIS.

The purpose of this study was to investigate the adoption of HRIS in a developing country like Ghana leveraging technological, organizational and environmental factors as a crucial endeavour for adoption success. Specifically, this paper looked at the adoption of HRIS among Ghanaian firms to gain better understanding of the contextual factors that influence HRIS adoption. The research questions to be addressed are (1) Have Ghanaian firms adopted the use of HRIS? (2) If they have not, how prepared are the firms in the adoption of HRIS? (3) What TOE factors affect the adoption of HRIS?

2 ADOPTION OF HRIS

Indisputably, the role of Information Technology or Information Systems (IT/IS) in industry and commerce cannot be over-emphasized (Wilson-Evered and Härtel, 2009). The literature delineates HRIS as the application of IT/IS in performing HR tasks (Strohmeier, 2007). HRIS has essentially helped many organizations with the effective management of its human assets (Troshani et al., 2011). Like all information systems, the use of HRIS is crucial for the success and profitability of any organization. Profitability can significantly be improved by reducing extant monitoring and controlling the cost of HRM processes (Sateem, 2012). This is evident from the fact that, firms that use HRIS have enough time to plan, gain sustainable competitive advantage by applying the system to influence strategic decision making (Thong, 1999), organization's value creation (Shani and Tesone, 2010; Rangriz et al., 2011) and inform or address many of the key policy and management questions (Kumar et al., 2013).

There is a gap between HRIS in a technical sense and its adoption and use by employees and line managers (Ruël et al., 2007). Adopting HRIS can be challenging and costly. Again, it can take long periods of time before pre-adoption benefits become reality after HRIS is fully assimilated (Ashbaugh and Miranda, 2002). Actual usage or adoption can lag by up to about three years what is available. Firms that undertake technology initiatives with a

view to enable the HR function to focus more on value-added activities are the ones most likely to realize its full potential (Shrivastava and Shaw, 2004).

HRIS adoption refers to the adoption of IT/IS in HRM (Jeyaraj et al., 2006; Strohmeier and Kabst, 2009). Adoption is distinguished into individual level (technology adoption by individual persons) and organizational level (technology adoption by organizations or organizational units) (Jeyaraj et al., 2006). Adoption also constitutes a process that comprises of several phases including initiating and implementing (Jeyaraj et al., 2006; Rogers, 2003). Other researchers depict the adoption of technological innovations in three-stage sequence of initiation, adoption, and implementation (Thompson, 1969; Pierce and Delbecq, 1977) with adoption as the stage where a decision is made about adopting the technological innovation.

2.1 Theoretical Framework

One of the most established approaches in studying innovation adoption entails identifying contingency factors that can affect adoption decisions in organizations (Fichman, 2004). A useful model that can be used for the structured analysis of innovation adoption in organizations have been proposed (DePietro et al., 1990). Specifically, this model suggests that decisions to adopt innovations are shaped by the influence and interaction of generic factors. Also known as "innovation configuration" (Fichman, 2004), these factors can jointly explain adoption outcomes in organizations, and are commonly classified into three broad categories, namely, Technology, Organization; and Environment (TOE) (Tornatzky and Klein, 1982; DePietro et al., 1990).

Though, the search for relevant and adequate theory to fully grasp the concept of HRIS and present fragmented empirical evidence is still apparent, there are continual demands in the literature to extend TOE approaches to unexplored domains including HR/HRIS (Teo, 2007; Dedrick and West, 2004; Lippert and Swiercz, 2005). Contrary to general factors, previous research in HRIS adoption does not refer to contextual factors alone (Strohmeier and Kabst, 2009). Some researchers declared that there were abundant fund of factors offered by previous research which makes it difficult to select meaningful factors accurately for HRIS adoption (Jeyaraj et al., 2006). As technology adoption is complex and context sensitive, specific factors of each category can vary across different
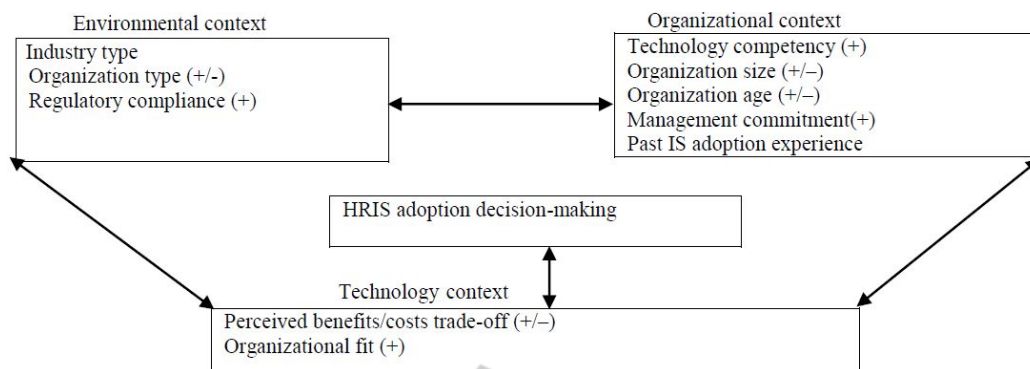
Figure 1: Innovation Adoption (TOE) Framework.

domains (Kuan and Chau, 2001). This can help to distinguish between intrinsic innovation characteristics, organizational capabilities and motivations, and broader environmental dimensions that impact on adopters (Dedrick and West, 2004).

For example, contextual variables such as organizational characteristics, IS characteristics, environmental characteristics and decision-maker characteristics as primary determinants of IS adoption has been proposed (Thong, 1999). This study, therefore, adopted the TOE framework developed by Tornatzky and Fleischer (1990) using HRIS adoption as a dependent variable with identifiable set of factors that influence adoption to include in the model as independent variables: firm size, industry type, type and age of organizations. Others were regulatory compliance, technology competence, management commitment, past IS adoption, perceived benefit/cost trade off and organizational fit as shown in figure 1 below.

3 METHODOLOGY

This study was designed to collect data from both primary and secondary sources. The population for the study was firms in both the public and private sector in Ghana. Out of 150 companies randomly selected, 129 responded and formed part of the sample size. Though these companies were scattered across the country, the study was based on convenience or accessibility sampling since all the respondents forming majority of the sample were conveniently accessed in Accra. Organizations were selected randomly from the Accra Metropolitan Area from the following broad categories: Technology/Telecommunication, Services, Manu-facturing/Production, Mining/Extracting and Trade/ Commerce organizations.

The survey method was used for the research. A

key strength of the survey method involves using questionnaires, a technique in the data gathering process which validity could be proven. Whiles the main research instrument for the primary data collection was questionnaires, the secondary source techniques focused on review of textbooks and some periodicals like journals, reports and magazines as well as useful reference materials including electronic databases from the Internet.

150 questionnaires were distributed to firms in the country. The questionnaires consisted of both open-ended and closed-ended questions. These questionnaires were self-administered to the respondents who completed the questionnaires without assistance from the researcher after they had been pilot-tested on five (5) colleagues. Respondents wereHR or IT managers or their representatives and had knowledgeable expertise in their fields. They were encouraged to complete and hand over the questionnaires in some few minutes to the researcher. However, respondents who could not instantly complete the questionnaires were allowed to keep them and complete at their convenience. The researcher, therefore, allowed some three days for this purpose. This made it easy and faster to distribute the questionnaire widely among respondents. Follow-ups through personal contact, phone calls and email notices were cautiously planned to retrieve the remaining questionnaires. This made it possible for the researcher to retrieve greater proportion (86%) of the questionnaires from the respondents.

The data was cleaned and coded using Statistical Package for Social Sciences (SPSS) version 16 programme. Both quantitative and qualitative techniques were used to create the appropriate frequency tables and charts like the bar graph to give a visual or pictorial representation of facts and to examine the relationships among variables. This also allowed simple inferences to be made to describe

variables, summarize and display the data collected for analyses. Again, descriptive statistical methods were employed to analyze the data. This made the presentation vivid for easy conclusions to be drawn.

4 RESULTS

Respondents were asked to indicate whether they have adopted a system or software to manage their HR, 51 of them representing 39.5% affirmed the situation while 78 representing 60.5% stated otherwise. Generally, it could be seen that the ratio of companies which have not adopted any system to manage their HR as against those who have is 3:2 as shown in the Figure 2 below. This means there were lots of companies in Ghana which have no system in place to manage their HR.
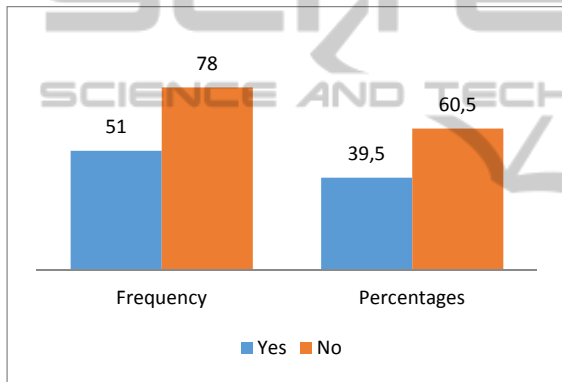

Figure 2: Adoption of HRIS.

As a confirmation of the above results, respondents were asked to state any alternative method of managing their HR apart from the use of HRIS, a whopping proportion of almost 95% indicated that they use the manual system. The low number of respondents who chose outsourcing (about 1%) shows that the practice is not common with Ghanaians as seen from Figure 3 below.
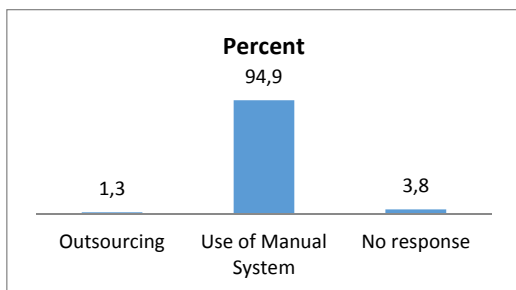

Figure 3: Alternative method of managing HR.

The details from the different organizations were depicted in the Figure 4 below. 45.1% of the private corporate companies have adopted HRIS while 43.6% of them did not have. With private SMEs, 9.8% indicated they have a system as against 28.2% which has no HRIS. For the companies limited by guarantee, all the 7.7% which formed part of the sample did not have any system they use to manage their HR. Again, all the 17.6% of the public companies forming the sample indicated they have. With the government and para-governmental organizations otherwise known as the public sector, 27.5% indicated they have while 20.5% indicated they did not have.
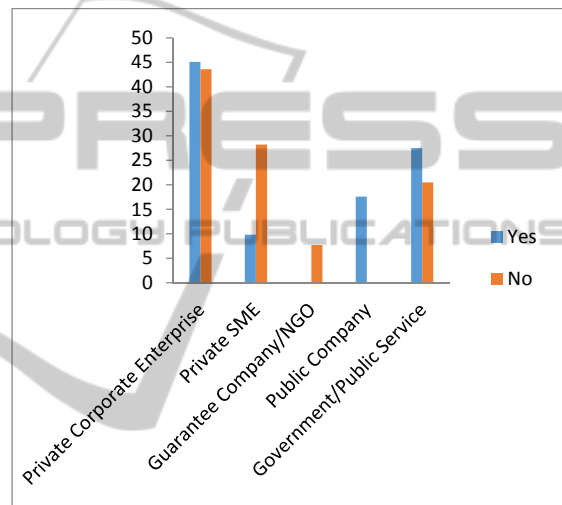

Figure 4: Distribution of Companies by Organizations.

Like most developing economy, the figure 5 below depict that the Ghanaian industry is dominated by the service sector with an average of 65%. It is, however, uncommon to find trade and commerce sector which has an average 15.5% following the service sector. This is because, as a developing country, petty trading and commerce is the livelihood of many of the citizens of the nation. The low proportion of technology, telecommunication and manufacturing sectors with an average of 7.8% apiece tend to reveal the low level of industrialization that characterizes developing countries like Ghana. An average of 3.9% goes for the extracting and processing industry.
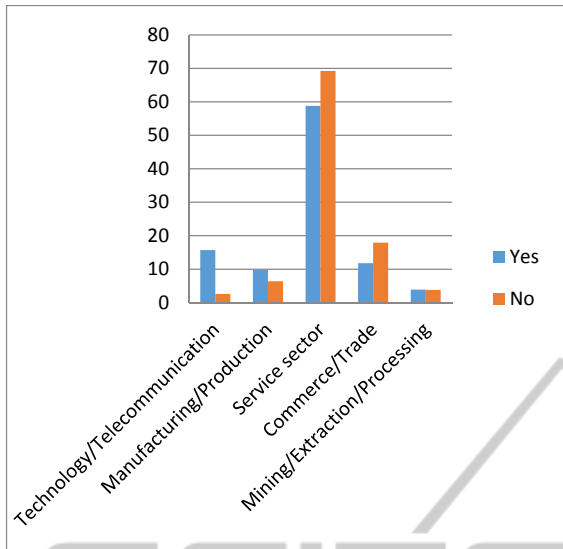
Figure 5: Distribution of Companies by Industry.

From the Figure 6 below, it could be seen that companies which employed less than 50 employees have as many as about 56% who have not yet adopted HRIS with only about 10% adopting it. On the contrary, adoption rate tended to be high with over 80% adoption rate for companies that employed over 100 staff. The higher the employment level, the bigger the size of the company and the better the adoption rate.
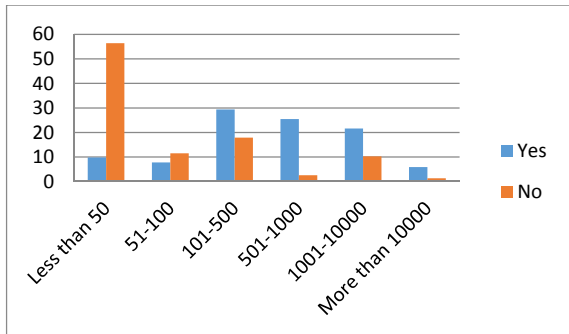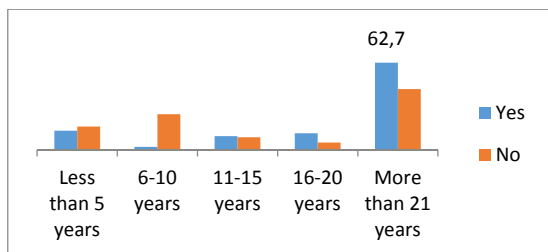

Figure 6: Size of the organization.

Figure 7: Age of organizations.

When the respondents were asked to provide the age of their firms, it was shown that the older the firm, the higher the adoption rate. The companies who were above 11 years tended to have a high rate of adoption as compared to those with few years of operation. Out of the 51% which were more than 21 years old, 62.7% have adopted HRIS in their organizations.

Figure 8 below shows the various reasons given by respondents for not adopting HRIS in their workplace. Among the reasons, a whopping number of about 36% indicated they were not ready to adopt such a system. About 32% thought they have low number of staff and therefore it is neither appropriate nor profitable to adopt such a system. 14% of the respondents were not aware of such a system while 7.7% apiece of the respondents attributed their non adoption of HRIS to either the exorbitant cost of acquisition and installation or as it was, were indifferent and as such did not answer this question.
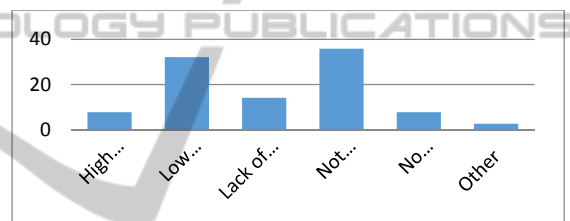

Figure 8: Reason for non-adoption of HRIS.

In response to the issue of whether respondents were ready to adopt the use of HRIS in their organizations, about 53% indicated they were ready while about 39% were not. About 9% did not respond to the question as shown from the Figure 9 below.
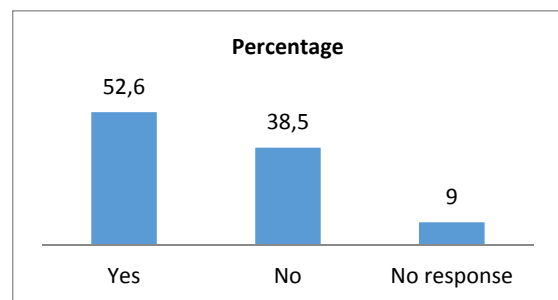

Figure 9: Readiness to adopt the use of HRIS.

From the Table 1 below, respondents were requested to indicate their extent of readiness and the period within which they were expected to implement HRIS. A cursory glance at the figure depicts that, out of the 53% of the respondents who

Table 1: Expected period of organization's readiness to adopt HRIS.

Organizational readiness	Expected period to start implementing HRIS				Total
	Less than 12 months	More than 12 months	Not sure/aware	Other	
Not planned	0	0	7	5	12
Currently exploring	5	6	3	0	14
Currently planning	4	1	2	2	9
Implementation stage	1	0	0	0	1
Other (Please specify)	0	0	0	1	1
Total	10	7	12	8	37

affirmed their readiness to adopt an HRIS, only one firm hope to implement HRIS within 12 months. 14 of them were currently exploring while 9 were currently planning. Out of the numbers above, only 10 firms were ready to implement HRIS within the next 12 months. 7 were ready to implement it after 12 months but within 24 months. 12 have not planned at all for the implementation of HRIS in their organization. The 12 who have no plans were also not aware or sure of when they would ever implement HRIS.

Finally, respondents were asked to state the factors that either facilitate or hinder the adoption of HRIS in their organizations and the following results were obtained:

- Staff resistance/reluctance to the use of the systems as a result of lack of understanding of the application
- Improper coordination and duplication of data problems
- Customization and adoptability problems including interfaced with other systems
- Lack of technical expertise to regularly support the system
- Managers are not ready to support an installation of a system.
- Wrong data input problems like inconsistency, inaccuracy, data confusion, loss of data, mismanagement of data, etc.
- Foreign nature of software makes it difficult to be used locally
- Inadequate support services for the systems from the vendors
- Access denial due to infrastructural unavailability like hardware, software, LAN, WAN and server breakdown
- Configuration of the system to conform to company's policies and procedures

- Systems failure and delay due to internet failure, power supply failure, etc.
- Migration of data from the old system to the new.
- The employees are comfortable with the manual system.

5 DISCUSSION

Undoubtedly, the study first established that about 40% of the firms in Ghanaian business environment have adopted HRIS though, this was not enough. In other words, a seeming number of about 60% of the firms have not adopted HRIS. This means that there was more room for improvement in the adoption of HRIS in Ghana. It was therefore realized from the study that most of these companies (about 95%) use the manual system to manage their HR. These companies include the Small and Medium Enterprises (SMEs) and the limited guarantee companies. A cursory look at figure 4 above indicates that the private corporate enterprises dominate in the organization type, followed by the government organizations and SMEs in that order. Though, the number of SMEs from the findings is small, it must be emphasized that some of the private corporate enterprises are registered as corporate entities but have the characteristics of SMEs, as portrayed in figure 4 above. It has, lucidly, been established that about 90% of companies registered in Ghana like most developing economies are micro, small and medium enterprises (UNIDO, 1999; Aryeetey, 2001)

This was clearly confirmed by over half of the firms which employ less than 100 employees as depicted in figure 6. In Ghana, SMEs have been recognized to be companies that employ less than 100 employees (Abor and Biekpe, 2009). Therefore, the type of registered company and the staff strength

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is very crucial having both positive and negative effect on HRIS adoption. Profit making private limited liability companies and firms with large staff strength, for instance, could afford and would purchase an information system to manage their HR requirements. This is because these firms are large and have the resources to afford such a system and its maintenance. After all, it would not be proper or useful to invest in such a system without ensuring that its maintainability and usage will provide owners sustainable competitive advantage.

On the contrary, most SMEs might not be in the position to use an information system like HRIS, from the study, due to size. This means the low number of staff employed by SMEs might not adequately satisfy the purpose for which such a system may be implemented. Despite this, it is very capital intensive to implement such a system which the SMEs might not afford. Firm size has been viewed as a determining factor of a firm's capital structure. Empirical evidence on the relationship between size and capital structure of SMEs supports a positive relationship (Sogorb-Mira, 2005). This means, the larger the firm, the bigger the capital structure and vice versa. Larger firms tend to be more diversified and hence have lower variance of earnings, making them able to tolerate high debt ratios (Wald, 1999).

Like most developing economy, Ghanaian industrial sector is dominated by the service sector, followed by trade and commerce sector. It is customary as a developing country to experience low technological, telecommunication and manufacturing sectors. The findings from the study depicted that industry has no linkage to the tendency to adopt HRIS in Ghana. The adoption rate does not reveal any positive or negative influence on HRIS adoption in the country.

However, the age of firms can impact positively or negatively on HRIS adoption. From the figure 7 below, it could be seen that firms with over 11 years experience tended to adopt HRIS compared with those less in age. The relationship depicted by age and adoption is crucial for successful HRIS implementation. The age of the firm is a standard measure of reputation (Abor and Biekpe, 2009). The use of firm reputation is the good name a firm has built over the years. This is important as it shows the firms' level of credibility and reputation in the industry and or country. If organizations have passed the test of time, then they are credible and so have high adoption capabilities.

Though respondents attributed the low number of staff as reason for not adopting an HRIS, it could

be seen from the above figure that many of them have not yet adopted it as a result of ignorance of the existence of the system and its importance or that they were not just ready for such a system.. It is interesting to note that some of these firms do not even know about HRIS let alone to adopt it. In fact, one of the respondents from the SMEs commented that discussions were ongoing in the organization to adopt such a system. Another stated that, they used to have one in place which was given problems so they never used it. They have, however, started negotiations with the vendor for an improved one.

Though majority of 53% of the respondents indicated that they were ready to adopt the use of HRIS, a significant number of about 39% were not ready. This high figure of non-readiness may be attributed to the fact that, respondents may be affirming their earlier response of low number of employees as a reason for not adopting HRIS. Again, this tells of the firms' inability to acquire the system due to higher implementation cost or their ignorance of the importance of the system. Adopting HRIS can be challenging as it can be costly and it can take long periods of time before pre-adoption benefits become reality after HRIS are fully assimilated (Ashbaugh and Miranda, 2002). Actual usage and adoption can lag by up to three years what is available. This is supported by the fact that, even those who believe they were ready to use such a system, about one third of them were not sure or aware of such a system and, therefore, had no plans on when to implement one.

6 CONCLUSION

Using theories from the technological innovation literature, this paper used quantitative data to validate HRIS adoption in Ghanaian companies. Out of the three contexts identified in the model, organizational characteristics are of primary importance in determining the decision to adopt HRIS. Factors such as the size of firms, the type of organization and the age of the organization are more likely to influence adoption of HRIS. Environmental factor, for example, industry type have no direct effects on the decision to adopt HRIS. Again, open-ended questions brought out information to answer other factors including technological characteristics like perceived cost benefits trade off and organizational fit which also affect HRIS adoption in Ghana. Other factors including organizational competence and past IS adoption could also be realized from these responses

to be other organizational factors which affect HRIS adoption. It was also seen that most firms were not ready to adopt HRIS due to cost of HRIS acquisition or implementation and the low number of staff especially for the SMEs. Apparently, most of the SMEs have not adopted HRIS from the study because of ignorance of the existence of the system and its importance and therefore, had no plans of implement one soon.

The results of this study have implications for HRIS adoption in Ghana and other developing countries. First, the study highlights the essentials of HRIS adoption and its implication to developing countries. Organizations that appreciate HRIS adoption and are willing to invest limited resources will be able to take advantage of the necessary benefits of HRIS adoption including improved organizational efficiency and effectiveness (Thong, 1999). It will assist managers to appreciate and apply the potential benefits from the use of the HRIS to all functional areas in HRM and also integrate it to the core business of the organization. HRIS adoption will also elucidate stakeholders including the government to be aware of its potential usefulness in order to formulate policies and strategies that will encourage its adoption locally. The study would enable researchers, practitioners and professionals worldwide to have a fair knowledge about opportunities and challenges associated with the application of HRIS in firms in developing economies like Ghana in order to advice accordingly.

The usefulness of HRIS cannot be overemphasized. Organizations can do well to adopt it to gain sustainable competitive advantage in whatever industries they find themselves. In using this, it is important to identify all of HR functions and develop the system to integrate these features into the system for use. It is also relevant that the system is designed in such a way as to be applied to the core business of organizations. When this happens, the system's use will not only be optimal, but also profitable to all stakeholders like customers, suppliers, partners, users, owners, managements, etc.

Nonetheless, the following areas are suggested for further research initiatives including:

- An empirical study of the extent of HRIS use of HRIS in firms in developing countries

- The perception of users on outsourcing of HRIS in organizations.

- HRIS adoption and use of HRIS in SMEs in developing countries

- Challenges and benefits from the use of HRIS in developing countries

REFERENCES

Abor, J. and Biekpe, N. (2009). How do we explain the capital structure of SMEs in sub-Saharan Africa?: Evidence from Ghana, *Journal of Economic Studies*, Vol. 36 No 1, pp. 83–97

Absar M. M. N. and Mahmood M. (2011), "New HRM Practices in the Public and Private Sector Industrial Enterprises of Bangladesh: A Comparative Assessment", *International Review of Business Research Papers*. Vol. 1 No. 2, pp. 118-136.

Aryeetey, E. (2001), "Priority research issues relating to regulation and competition in Ghana", *Working Paper Series, Centre on Regulation and Competition*, Manchester.

Ashbaugh, S. and Miranda, R. (2002), "Technology for human resources management: seven questions and answers", *Public Personnel Management*, Vol. 31 No.1, pp. 7-20.

Ball, K. S. (2001), "The use of human resource information systems: a survey", *Personnel Review*, Vol. 30 No. 6, pp. 677-93.

Blount, Y. and Castleman, T. (2009), "The curious case of the missing employee in information systems reserach", *Proceedings of the 20th Australasian*.

CedarCrestone. (2005). "Workforce technologies and service delivery approaches survey", *8th Annual Edition*.

Chen, W. (2014), "A Framework for Human Resource Information Systems Based on Data Streams", International *Journal of Hybrid Information Technology*, Vol.7, No.3, pp.177-186

Dedrick, J. and West, J. (2004), "An exploratory study into open source platform adoption", Proceedings of the 37th Hawaii International Conference on System Sciences, IEEE, Big Island, HI, USA.

DePietro, R., Wiarda, E. and Fleischer, M. (1990), "The context for change: organization, technology and environment", in Tornatzky, L.G. and Fleischer, M. (Eds), *The Process of Technological Innovation*, Lexington Books, Lexington, MA, pp. 151-75.

Dessler G. (2011), *Human resource management* 12th ed., Prentice Hall, New Jersey.

Fichman, R. G. (2004), "Going beyond the dominant paradigm for information technology innovation research", *Journal of the Association for Information Systems*, Vol. 5 No. 8, pp. 314-55.

Gueutal H. G. and Stone D. L. (2005), The Brave New World of e-HR, Jossey-Bass,San Francisco.

Henriksen, H. Z. and Mahnke, V. (2005), "E-procurement adoption in the Danish public sector", *Scandinavian Journal of Information Systems*, Vol. 17 No. 2, pp. 85-106.

Hendrickson A.R. (2003). Human Resources Information Systems: Backbone Technology of Contemporary Human Resources. *Journal of Labor Research.* 24(3): 382-394.

Jeyaraj, A., Rottman, J. and Lacity, M. (2006), "A review of the predictors, linkages and biases in IT innovation

adoption research", *Journal of Information Technology*, Vol. 21 No. 1, pp. 1-23.

Kuan, K. K. Y. and Chau, P. Y. K. (2001), "A perception-model for EDI adoption in small business using a technology-organization-environment framework", *Information and Management*, Vol. 38 No. 8, pp. 507-12.

Kumar et al., (2013), "The human resource information system: a rapid appraisal of Pakistan's capacity to employ the tool", BMC Medical Informatics and Decision Making, Vol. 13 No. 104, http://www.biomedcentral.com/1472-6947/13/104

Lippert, S. K. and Swiercz, P. M. (2005), "Human resource information systems (HRIS) and technology trust", *Journal of Information Science*, Vol. 31 No. 5, pp. 340-53.

Mishra A. and Akman I. (2010). Information Technology in Human Resource Management: An Empirical Assessment. *Public Personnel Management*. Vol. 39 No. 3: pp. 243-262.

Palvia, P. C., Palvia, S. C. J. and Whitworth J. E. (2002), "Global information technology: a meta analysis of key issues", *Information & Management* Vol. 39, pp. 403–414.

Pierce, J. L., and Delbecq, A. L. (1977), Organizational structure, individual attitudes and innovation, *Academy of Management Review*, Vol. 2 No. 1 pp. 27-37.

Rangriz H., Mehrabi J and Azadegan A. (2011). The Impact of Human Resource Information System on Strategic Decisions in Iran. *Computer and Information Science*. Vol. 4 No. 2 pp. 81-87.

Rogers, ü. M. (1983), Diffusion of Innovations, 3d ed. New York: Free Press.

Ruël, H. J. M., Bondarouk, T. and Van der Velde, M. (2007), "The Contribution of e-HRM to HRM Effectiveness", *Employee Relations*, Vol. 29 No. 3, pp. 280–291.

Saleem, I. et al., (2011), "Role of Information and Communicational Technologies in perceived Organizational Performance: An Empirical Evidence from Higher Education Sector of Pakistan", *Business Review*. Vol. 6 No. 1 pp. 81-93.

Sateem I. (2012), Impact of adopting HRIS on three tiers of HRM: Evidence from Developing Economy, University of Central Punjab, Lahore, Vol. 7 No. 2

Shani A. and Tesone D. V. (2010), "Have human resource information systems evolved into intemal e-commerce?" *Worldwide Hospitality and Tourism Themes.* Vol. 2 No. 1 pp. 30-48.

Shrivastava, S. and Shaw, J. B. (2004), "Liberating HR through technology", *Human Resource Management*, Vol. 42 No. 3, pp. 201-222.

Sogorb-Mira, F. and How, S. M. E. (2005), "Uniqueness affects capital structure: evidence from a 1994-1998 Spanish data panel", *Small Business Economics*, Vol. 25 No. 5, pp. 447-57.

Stanton, J. M. and Coovert, M. D. (2004),"Turbulent waters: The intersection of information technology and human resources",*Human Resource Management*, Vol. 43 No. 2, pp. 121−125.

Strohmeier, S. (2007), "Research in e-HRM: Review and Implications", *Human Resource Management Review*, Vol. 17, No. 1, pp. 19-37.

Strohmeier, S. and Kabst R. (2009), "Organizational adoption of e-HRM in Europe: An empirical exploration of major adoption factors", *Journal of Managerial Psychology,* Vol. 24 No. 6.

Teo, T. (2007), "Organizational characteristics, modes of internet adoption and their impact: a Singapore perspective", *Journal of Global Information Management*, Vol. 15 No. 2, pp. 91-117.

Thompson, V.A. (1969), Bureaucracy and Innovation. Huntsville: University of Alabama Press.

Thong, J. Y. L, (1999), An Integrated Model of Information Systems Adoption in Small Businesses. Journal of Management Information Systems, Vol. 15, No. 4 pp. 187-214

Tornatzky, L. and Fleischer, M. (1990), The Processes of Technological Innovation, Lexington Books,New York, NY.

Tornatzky, L.G. and Klein, K.J. (1982), "Innovation characteristics and innovation adoption implementation: a meta-analysis of findings", *IEEE Transactions on Engineering Management*, Vol. EM-29 No. 1, pp. 28-45.

Townsend, A. M. and Bennett, J. T. (2003),"Human resources and information technology",*Journal of Labor Research*, Vol. 24 No. 3, pp. 361−363.

Troshani, I., Jerram, C. and Gerrard, M. (2010), Exploring the organizational adoption of human resources information systems (HRIS) in the Australian public sector, *Proceedings of the 21st Australasian Conference on Information Systems (ACIS2010)*, Brisbane, Australia.

Troshani I., Jerram C. and Hill S.R. (2011). Exploring the public sector adoption of HRIS. *Industrial Management & Data Systems*. Vol. 111 No. 3 pp. 470 – 488.

UNIDO, (1999) SMEs in Africa Survive against all Odds, http://www.unido.org/doc/view?document_id=3927&language_code=en.

Viswesvaran, C. (2003), "Introduction to special issue: Role of technology in shaping the future of staffing and assessment", *International Journal of Selection and Assessment*, Vol. 11 No. 2-3, pp. 107−112.

Wald, J. K. (1999), "How firm characteristics affect capital structure: an international comparison", *Journal of Financial Research*, Vol. 22 No. 2, pp. 161-87.

Wilson-Evered, E. and Härtel, C. E. J. (2009). Measuring attitudes to HRIS implementation: a field study to inform implementation methodology. Asia Pacific *Journal of Human Resources,* Volume 47, Issue 3, pp. 374–384.

Yusoff, Y., Ramayah T. and Ibrahim H. (2010), E-HRM: A proposed model based on technology acceptance model, *School of Management*, University Sains Penang, Malaysia.