THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON THE EFFICIENCY OF HUMAN RESOURCE MANAGEMENT IN CAMEROON: CASE OF LITTORAL DELEGATION OF SECONDARY EDUCATION

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Abstract
The objective of this study is to determine the impact of Information and Communication Technology (ICT) on the efficiency of Human Resource Management in the Ministry of Secondary Education in Cameroon. It specifically seeks to investigate how the use of ICT affects the following human resource management practices; Human resource planning, training and development, selection and recruitment, census, human resource evaluation and compensation. An exploratory research design was employed in the study. A random sample of 100 management and junior staffs working under the Littoral Delegation of Secondary Education responded to a structured questionnaire. Percentages were used to establish the responses of the respondents over the use of ICT tools in HRM in their Delegation and Ministry. The results show a recent significant positive relationship between the use of ICT in selection, recruitment, placement, census and compensation of workers of this delegation but not on training and development, Human resource planning, evaluation and general efficiency of human resource management. It is recommended that regular Information and Communication Technology training and development programmes be enhanced in the Ministry of Secondary Education through short courses, symposia and seminars so as to ensure proper interactions between Human Resource Management in the Ministry of Secondary Education and its different delegations which will lead to the efficiency of the Ministry in discharging its HR functions. The Ministry of Secondary Education should also impose the study of ICT in all programmes of Higher Teachers' Training Colleges so as to equip the personnel of its Ministry with knowledge that can ensure the effective and efficient HRM functioning through the use of the ICT tools. Junior as well as Management staffs of this ministry already working should make an endeavor to study the use of ICT tools so as to equally improve on their knowledge and skills of executing HR functions.

Keywords: Information and Communication Technology, Human Resource Management and efficiency

Introduction

Schuler, (1990) opines that the past decades have witnessed the transition of employees becoming the most precious capital in organizations and the ascent of Human Resource Management (HRM). The problem in technological changes is frequently that people and

technology do not meet and people do not participate. Walker and Watson (2002) argue that clear and precise models of operation must be presented when a technology is introduced, and leading advocates should be recruited. The development of ICTs brought about a major shift in the world. The Information Age is a contemporary meta-narrative that guides many studies in all fields.

As a theoretical space within which to conduct contemporary research, the information age suggests that we are moving beyond the industrial age into an era where the sharing of knowledge and ideas is the new driver of power and the world economy. Whether one discusses the emergence of global financial systems or growing citizen solidarity networks, one thing remains common and is at the core of the new society, the solicitation and exchange of the world's most valuable resource; "information".

The Information Age affects us through its media and images, which alters our lives, communities, nations and states, and have tremendous impacts on our identities and our imaginations (Appadurai, 1996). Cultural flows are travelling in all directions, to and from both developed and developing countries. As a result of digital divide, the use and benefits of ICTs are a reality and a strategy that still remains out of the reach of many people in the world (Shields, 2003), but we can imagine that few are truly sheltered from the impacts of ICTs. The communications that occur through these channels do spread beyond their initial medium through other means and therefore tend to reach much wider audiences. The contents of online communications have the ability of travelling between the physical and virtual worlds, and back again, both in developed and developing countries (Lim, 2003).

Therefore, it remains evident that if technology is to foster the effective management of HRM performance in organizations, it has to be able to support not only access to documented knowledge but, most importantly, knowledge held by individuals who are the main resources (assets) of the organization. In addition to enhancing the visibility and traceability of such knowledge, technology needs to aim at catalyzing collaboration and knowledge transfer among its holders both within and among organizations. It is with these premises that the research topic: "The impact of ICT on the efficiency of HRM in Cameroon" is conceived.

Some decades back since the introduction of information and communication technology in Cameroon, the impact on the Ministry of Secondary Education of the country is still very little. The recruitment, placement, training, appointment, transfer and compensation of its workers is still almost entirely traditional characterized by too much laborious paper work and a long administrative procedure thus making the whole process slow and cumbersome. Until the recent teachers strike action of 2021, once a worker of the Ministry of Secondary Education was recruited and trained till the end, it took him or her another 2 years or more to taste the first salary and is possible for him or her to work until retirement without advancement or promotion. This is due to the cumbersome manual procedure involved in processing documents in this

Ministry. ICT tools are not used to schedule the increment in wages and promotion of workers as the case may be.

The impact of ICT has received little research attention, particularly in Cameroon. For this reason, the objective of this paper is to assess the extent to which the full adoption of ICT tools can improve on human resources management in the Ministry of Secondary Education drawing inferences from the Littoral Delegation of Secondary Education, and to contribute to empirical literature by investigating how ICT affects the efficiency of HRM in Cameroon (i.e. the ability of HRM to operate faster and at a lower cost).

Conceptual Clarification

Information and Communication Technology (ICT)

Jimoh (2007) defines Information and Communication Technology (ICT) as the handling and processing of information (texts, images graphs, and instructions) for use, by means of electronic and communication devices such as computers, cameras and telephones. ICT can also be considered to be an electronic or computerized device, assisted by human and interactive materials that can be used for wide range of teaching and learning as well as for personal use.

Again, Castells (2000) defines ICT as the new social morphology of our society which is both a structure and a process that enables the exchange, the redirection, and the reception of information, on a global scale, without restraints of space or time. Distance is rendered irrelevant, allowing direct, simultaneous, decentralized, and expanding relations of collaboration, advocacy, trade, production, and innovation, generating new forms of power constellation and distribution.

Human Resource Management

This has to do with everything concerning the selection, recruitment, training and development, placement, and induction of workers, Human resource planning, evaluation and compensation. Human resource management (HRM) has recently been re-defined by Armstrong (2009) as a "strategic, integrated and coherent approach to the employment, development and well-being of the people working in organizations… it covers activities such as strategic human resource management, human capital management, corporate social responsibility, knowledge management, organization development, resourcing (human resource planning, recruitment and selection, as well as talent management), performance management, learning and development, reward management, employee relations, employee well-being and health and safety and the provision of employee services". In short it involves the strategic administration of the **3Ms i.e. MEN, MATERIALS and MONEY** in the organization.

According to Valverde et al. (2006), Human Resource function is "all managerial action carried out at any level regarding the organization of work and the entry, development and exit of people

in the organization so that their competencies are used at their best in order to achieve corporate objectives". It includes the actors as well as their relevant responsibilities and tasks.

The Efficiency of Human Resource Management (HRM)

The efficiency of HRM in this study refers to the ability of an organization to effectuate its activities faster and at a lower cost. To meet the demands of today's needs, there is an increasing pressure on HRM to support strategic objectives and to focus on value-adding activities, which consequently leads to the change in the job content and the expectations on Human Resource (HR) professionals. Shrivastava and Shaw (2004), Stone et al. (2006) noted that one of such changes is the wide, contemporary use of Information Technology (IT) supporting various HR activities. Moreover, researchers expect that the increasing use of Human Resource Information Technology (HRIT) can improve the performance of HR professionals and make them involve in the company's internal consulting activities (Albers et al. 1997). In addition, Ulrich (1997) mentions that the use of HRIT provides value to the organization and raises HR professionals' status in the organization. Contemporary HRM sees the use of ICT as a catalyst to operational efficiency. This view has been supported by ever increasing investment in developing countries in ICT related management devices (Kuyoro et al., 2012).

Theoretical Framework

The most important theory selected for this paper is the Public Institutional Framework. Applied to the study of Public Administration in 1989 by James Q. Wilson (Frederickson, G. et al, 2012:68), Institutionalism sees organizations as bounded social constructs of rules, roles, norms, and the expectations that constrain individual and group choice and behavior. As a result, Institutionalism accounts for how and why institutions behave and perform the way they do.

Institutionalism is premised on the assumption that collective outcomes and individual behavior are structured by the institution. It however, focuses on **HIGH RELIABILITY** having to do with: the adoption of rigid rules, high level of training and retraining of workers, achieving high level efficiency, having a hierarchical system of the organization, highly networked with many institutions linked in the production chain. Institutionalism focuses also on **LOW RELIABILITY** which is simply the opposite of **HIGH RELIABILTY.**

Public Institutional Framework is also built on the assumption of diffusion which is the spread of something from the source like behavior, technology and beliefs to the adopters who are equally part of the system.

Public Institutional Framework has been criticized for lack of parsimony, including dozens of variables and hypotheses and for lacking in a simplifying core premise such as the rational pursuit of self interest (Frederickson, G. et al, 2012). Despite these criticisms, institutionalism is relevant to this study because the paper seeks to examine the extent to which the Ministry of Secondary Education can link its Regional Delegations in a net work chain, train and retrain its

workers in the use of ICT, adopting a uniform rule from the Ministry to run down to all the Regional Delegations and realizing efficiency in the performance of HR functions. The **HIGH RELIABILITY, LOW RELIABILITY AND DIFFUSION** premises of the Public Institutional Framework all echoes this.

Review of related Literature

Davis (1989: 320) came up with the Technology Acceptance Model (TAM) aimed at predicting and explaining ICT usage behavior, that is, what causes potential adopters to accept or reject the use of information technology. TAM is based on the Theory of Reasoned Action (TRA). In TAM, two theoretical constructs perceived usefulness and ease to use, as the fundamental determinants of system use and as well predicts attitudes toward the use of the system, that is, the user's willingness to use the system. Perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance", and perceived ease to use refers to "the degree to which a person believes that using a particular system would be free of effort".

Ajzen (1991) work on the Theory of Planned Behavior (TPB), which focuses on cognitive self-regulation is similar to the TRA model, but the difference is that it takes into account an additional construct; perceived behavioral control, referring to the perception of control over the performance of a given behavior. In TRA rational considerations determine the choices and behaviors of individuals, and individual intentions determine behavior. Intentions refer to individuals' plans and motivations to commit a specific act. Intentions also reflect individual attitudes and the extent to which individuals perceive a specific act as desirable or favorable. The theory suggests that human behavior is not only governed by personal attitudes, but also by social pressures and sense of control. It provides useful information to understand these behaviors, or to implement effective interventions to change them. The studies of Mathieson (1991) compared the ability of TPB and TAM to explain behavior and predict an individual's intention to use ICT, respectively.

Rogers, (1983) Diffusion of Innovations (DOI) is a general theory of how new ideas are spread and adopted in a community, and it seeks to explain how communication channels and opinion leaders shape adoption. Rogers proposes the first process model, a five-stage model of the implementation and adoption of innovation in organizations. Moore and Benbasat (1991) used DOI to develop "an instrument designed to measure the various perceptions an individual may have before adopting an information technology (IT) innovation". The instrument is intended to be a tool for the study of the initial adoption and subsequent diffusion of IT innovations within organizations.

Venkatesh et al, (2003) Unified Theory of Acceptance and Use of Technology (UTAUT) reviews the eight models that explain ICT usage, such as TRA, TAM, the motivational model, TPB, a model combining TAM and TPB, the model of PC utilization, DOI, and the social

cognitive theory. The purpose of UTAUT is to explain a user's intention to use ICT and the subsequent user behavior.

Information Systems Success Model is one of the theories developed by DeLone and McLean (1992) to determine the success of information systems. The authors categorize success measures into six major categories: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. These categories are interrelated and interdependent and provide a comprehensive view of Information System success. The target of the model is to guide future research efforts.

Theory of complementarities, developed by Gargallo-Castel and Galve-Górriz (2007) highlights the fact that ICT alone is not sufficient to guarantee increase in organizational output. It should be complemented with other human attributes like capabilities, special talent of workers, direction and proactive spirit of the workers. Thus, an increase in output can only be assured with a combination of these attributes and ICT. Therefore, the benefits in any organization will be greater if ICT is used together with the adequate organizational resources and capabilities, specifically workers' qualifications, proactive direction and innovative culture.

Some authors have also attempted to identify differences of the role of IT between services and process oriented industries, and significant differences. Most of the existing studies have been conducted in Western Europe and in the United States. Their result may not be applicable to the other parts of the world due to social and economic differences (Seyal et al., 2000). Comparatively, very little has been researched in this field in the developing countries especially Cameroon. Empirical evidence from developing countries suggests that increase investment in ICTs does not necessarily lead to higher HR performance (Dewan and Kraemer, 2000; Lal, 2001; Chowdhury, 2006). This might reduce the enterprises' incentives to use ICTs, especially when they are facing tight budgetary constraints. In addition, many enterprises are still using traditional methods and these enterprises can switch to use ICTs only if the benefits derived are higher than the investment and maintenance costs.

The relationship between HRM and productivity of industries has been extensively investigated. Mathur (2009) in his financial analysis of ICT industry, attempts to quantify the technical efficiency of the ICT in 52 countries. The study suggests that the productivity growth in the ICT sector is developing and newly industrialized countries are slightly lower than the growth in developed and transition countries, suggesting a catching-up for developing and newly industrialized countries. The main limitation of this study is that the data collected from all the countries is not firm enough to determine how ICT affects the HR performance.

In the same light, Zwick (2003) studies on the impact of ICT investment on productivity for a large German establishment panel data set with establishments without ICT capital inclusive, indicates that ICT investment substantially increases the average productivity of German

establishments. The limitations of this study is that the corresponding size of the ICT investment is not known, the only thing known is that the establishment invested in ICT.

Using the same approach, Saleem et al. (2011); attempts to measure the Impact of ICT on Organizational Productivity (Efficiency and Effectiveness); which leads to Organizational Performance. The study found significant relations of ICT adoption on the effectiveness and efficiency of organizations. The study has as limitation the fact that the sample is just from those members who are IT literate not from other areas.

On his part Zafar's (2009) studies on the electronic HRM (e-HRM) practices in the State Bank of Pakistan identifies that e-HRM practices are not yet fully visible in Pakistan; things will take time to improve. Also that employees are happy with technological changes in HRM as it is making their work easier. The major limitation of this study is that the researcher focuses on already available literature which does not provide any evidence from Pakistan.

An extensive body of literature exists on the usage, adoption, implementation and application of ICT (Seyal et al. 2000). However, most of the existing studies have focused on the use of IT in general (Ange and Koh, 1997). Regrettably, empirical studies and the theory on how ICT influences organizations are still underdeveloped (Wang, 1997). One area receiving little attention is research on successful ICT use is HRM practice (Othman and Teh, 2003).

Similar observations demonstrate that the existing literature has paid little attention to assessing the impact of IT on HRM in various organizations in different sectors in a systematic way. Studies conducted by Elliott and Tevavichulada (1999) and Currie (1996) represent some progress in this direction. They have indicated that the sector in which the organization operates is significant in terms of influence on the structure of IT activities.

Data Collection and Analysis

Self-administered questionnaires were used to collect data from respondents (see Appendix 1).

Table 1.1 Questionnaire distribution and Retrieval Rates

Types of Staff	Number Administered	Number Retrieved	Total
Management staff	20	20	20
Junior staff	80	80	80
Total	100	100	100

Source: Field Survey (July, 2022)

Table 1.2 Responses to the Questionnaires

S/N	Questionnaires	Yes	No	Total
1	Does your Ministry Advertise Jobs over the Internet?	75	25	100

2	Does it use online application platforms to recruit workers?	35	65	100
3	Is your delegation connected to the Web Net of the Ministry?	20	80	100
4	Does your Delegation call workers on phone when they are needed?	55	45	100
5	Does the Ministry use the ICT to train and retrain its workers?	30	70	100
6	Is your ministry using the internet and other web modules for training?	25	70	100
7	Does your ministry use the computerized system to evaluate worker's performance?	20	80	100
8	Is your Ministry using computers to register the salary of workers?	100	00	100
9	Does your ministry use the internet to plan the retirement and pension of its workers?	30	70	100
10	Work would be lighter and fast if your ministry recruits and train workers by net	85	15	100
11	Evaluating workers' performance through a computerized system would ensure efficiency avoiding favoritism	80	20	100
12	Work will even become easier if the census of workers of your ministry was carried on from a special website	85	15	100

Source: Field Survey (July, 2022)

Results and discussion

Performance in terms of efficiency i.e. HR use of ICT tools for evaluation is expressed at 20% acceptance rate, against 80% denial rate. 100% acceptance rate is also recorded for the use of ICT tools for compensation (payment of salaries). The use of ICT tools for training and development are expressed at 70% denial rate and 30% acceptance rate, while the use of ICT tools for selection and recruitment are expressed at 65% denial rate and 35% acceptance rate.

The use of ICT tools to plan worker's retirement and pension is expressed at 70% denial rate and 30% acceptance rate and the interconnection of the delegation to the Ministry through internet is rated at 80% denial rate and 20% acceptance rate.

It is clear that the use of ICT tools in HRM in the Ministry of Secondary Education is still very low with higher responses above 50% only recorded in advertisement of jobs in the ministry (75%), use of the telephone to call workers (55%) and use of computer systems to pay workers (100%). However, respondents are of the opinion that if their Ministry adopts the use of the internet in the recruitment and training (85%) and evaluation of staff (80%), this will lead to efficiency of the functions of HRM as work will shift from the classical traditional form of slowness and cumbersome paper work full of errors and favoritism, to fast and easy execution (85%) of HRM functions void of errors.

Summary, Recommendations and Conclusion

This paper investigates the contribution of ICT to the efficiency of HR functions. It highlights that ICT accelerates activities, enhances fast and easy treatment of information (Armstrong, 2009).

Globally the results of this study reveals that the use of ICT in HR advertisement of jobs, call of workers to order and payment of workers enhances its efficiency. HRM operations become faster, more convenient and cheaper when ICT tools are being used. These results show that the use of ICT has a positive effect on HRM, it corroborates with the results of Kovach and Hughes (2002) who opine that ICT programs can facilitate salary forecasts, pay budgets, labor/employee relations with information on contract negotiations, and employee assistance.

The study equally shows that eHRM reduces data errors, simplifies and fasten processes of HR practices, these views are supported by Ulrish et al. (2008) who confirms in his study on the extent to which ICT permits professionals to spend less time on administrative tasks and on interpreting results for better organizational policy.

The use of ICT tools make the recruitment process cheaper to the company and more convenient to the job applicant. Hendrickson (2003) highlights that these ICT tools have the potential to remove obstacles and permit the organization to reach a larger pool of applicants.

The development of ICT has significantly enhanced HRM planning. The result shows that ICT assists HRM planning thus increasing HRM efficiency. This is particularly true because it makes it possible for managers and line managers to integrate activities of employees within a common system and control how the different tasks are effectuated. It makes it possible to quickly access information, correct problems within the process (Hendrickson, 2003) with the emergence of ICT and its integration in HRM it is now possible to easily follow-up different operations without going through a heap of file, though the Cameroon Ministry of Secondary Education is still to fully engage into this.

Recommendations

1) It is recommended that regular Information and Communication Technology training and development should be enhanced through seminars, symposia and short courses so as to allow proper interactions between Human Resource Management in the Cameroon Ministry of Secondary Education and its different delegations which could lead to the efficiency of this ministry in its discharge of HR functions.
2) The Cameroon Ministry of Secondary Education should make ICT compulsory in all its programmes in Higher Teacher's Training Colleges so as to equip its personnel in the use of ICT tools. This will ensure the effective and efficient execution of HRM functions through the use of the ICT tools.
3) Management as well as junior staffs of the Cameroon Ministry of Secondary Education already working should endeavor to make personal efforts towards the acquisition of knowledge on ICT tools which will facilitate HRM functions.

Conclusion

The emergence of ICT and its integration in performing HR functions has had divergent results on organizational performance, but its impact on HRM efficiency is not very clear. It has been confirmed by some researchers that the use of ICT tools to perform HR functions results to the efficiency of HR management. This paper empirically investigates this within the Cameroon context, by first determining the major ICT tools (through the questionnaire) used in the different HR functions, then their impact on HRM performance and efficiency. This study has contributed to literature by extending research on the impact of ICT on organizational performance and efficiency of HRM. This study is based on the effect of the use of ICT as a tool for human resource efficiency in Cameroon with the Littoral Delegation of Secondary Education as case study. Extending this research to other sectors so as to verify the divergence will be very interesting. The impact of ICT on the efficiency of human resource management in the Cameroon Ministry of Public Service and Administrative Reforms and the Ministry of Finance in Cameroon will also be very interesting. This is because these Ministries deal with the largest resources to manage.

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Appendix 1: Questionnaire

UNIVERSITY OF BUEA

FACULTY OF LAW AND POLITICAL SCIENCE

DEPARTMENT OF PUBLIC LAW AND PUBLIC ADMINISTRATION

PMB 63, BUEA SOUTH WEST REGION

Dear Respondent,

My name is **NTEM GIDEON MAHMBO (PhD) in Political Science (Specialty in Public Administration)** from the University of Buea, carrying out a research on the topic ¨**the impact of information and communication technology (ICT) on the efficiency of HRM in Cameroon: Case of Littoral Delegation of Secondary Education.** The work is purely for academic purpose and so does not require your name. As a result, kindly feel free to express your mind to issues raised in this questionnaire by placing a bull tick against YES or NO. Thanks in advance.

A. Identification:

I. Senior management staff_____

II. Junior staff_____

B. Questions to determine the efficiency of ICT tools on HRM in Cameroon

S/N	Questionnaires	Yes	No	Total
1	Does your Ministry Advertise Jobs over the Internet?			
2	Does it use online application platforms to recruit workers?			
3	Is your delegation connected to the Web Net of the Ministry?			
4	Does your Delegation call workers on phone when they are needed?			
5	Does the Ministry use the ICT to train and retrain its workers?			
6	Is your ministry using the internet and other web modules for training?			
7	Does your ministry use the computerized system to evaluate worker's performance?			
8	Is your Ministry using computers to register the salary of workers?			
9	Does your ministry use the internet to plan the retirement and pension of its workers?			
10	Work would be lighter and faster if your ministry recruits and train workers by net			
11	Evaluating workers' performance through a computerized system would ensure efficiency avoiding favoritism			
12	Work will even become easier if the census of workers of your ministry was carried on from a special website			

END