

Piabuo, Serge Mandiefe; Piendiah, Ngwe Elvis; Njamnshi, Njoh Lawrence;  
Tieguhong, Puatwoe Janice

## Article

# The impact of ICT on the efficiency of HRM in Cameroonian enterprises: Case of the Mobile telephone industry

Journal of Global Entrepreneurship Research

## Provided in Cooperation with:

Springer Nature

*Suggested Citation:* Piabuo, Serge Mandiefe; Piendiah, Ngwe Elvis; Njamnshi, Njoh Lawrence; Tieguhong, Puatwoe Janice (2017) : The impact of ICT on the efficiency of HRM in Cameroonian enterprises: Case of the Mobile telephone industry, Journal of Global Entrepreneurship Research, ISSN 2251-7316, Springer, Heidelberg, Vol. 7, Iss. 7, pp. 1-18, <https://doi.org/10.1186/s40497-017-0063-5>

This Version is available at:

<https://hdl.handle.net/10419/196987>

### Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

### Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by/4.0/>

RESEARCH

Open Access



# The impact of ICT on the efficiency of HRM in Cameroonian enterprises: Case of the Mobile telephone industry

Serge Mandiefe Piabuo<sup>1\*</sup>, Ngwe Elvis Piendiah<sup>2</sup>, Njoh Lawrence Njamnshi<sup>2</sup> and Puatwoe Janice Tieguhong<sup>3</sup>

\* Correspondence:

P.Mandiefe@cgiar.org

<sup>1</sup>World Agroforestry Centre,  
Yaounde, Cameroon

Full list of author information is  
available at the end of the article

## Abstract

The objective of this study is to determine the impact of Information and Communication Technology on the efficiency of Human Resource Management in the Cameroon mobile Telecommunication Sector. It specifically seeks to investigate how the use of ICT affects the following human resources management practices; Human resource planning, training and development, selection and recruitment, human resource evaluation and compensation. An exploratory research design was employed in the study. A sample of 120 management, senior, junior and contract staffs of the 03 (three) main mobile telephone operators responded to a structured questionnaire. The data collected was coded and entered into SPSS version 17. Pearson correlation coefficient was used to establish the relationship between the variables in the study, regression analysis was used to establish the combined effect of study variables on the dependent variable. The results show a significant positive relationship between the use of ICT in selection and recruitment, training and development, Human resource planning, evaluation and compensation and human resource management efficiency. This highlights the use of ICT as an efficient tool in Human resource management of enterprises. The use of ICT assures Human resource management efficiency, we therefore suggest that regular Information and Communication Technology training and development should be enhanced so as to allow proper interactions between Human Resource Management and the different departments which could lead to the organizational efficiency.

**Keywords:** *ICT, HRM, HR functions, HRM efficiency, ANOVA test, Telecommunication sector*

## Background

Jimoh (2007) defines Information and Communication Technology (ICT) as the handling and processing of information (texts, images graphs, instruction, etc.) for use, by means of electronic and communication devices such as computers, cameras, telephones. Off-odu (2007) also refer to ICT as electronic or computerized devices, assisted by human and interactive materials that can be used for wide range of teaching and learning as well as for personal use. The past decades has witnessed the transition of employee becoming the most precious capital in an enterprise and the ascent of Human Resource Management (HRM) (Schuler, 1990). 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 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". Defined as the new social morphology of our society, ICT 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 (Castells, 2000). As tools that allow immense exchanges of information, ICTs impact many realms. The use of Internet in the quest to promote and defend human rights, international law, and democratic governance, is well documented and is perhaps the strongest asset for civil society struggles around the world today and one of the most positive examples of the space of flows.

Traditional HRM was characterized by too much paper work and a long administrative procedures, which made the whole process slow. 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 demand of today's need, 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 makes 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 have been supported by ever increasing investment in developing countries in ICT related management devices (Kuyoro et al., 2012).

As such there is little or no room for argument on the notion that "people" are one of the key assets determining the success or failure of an organization and hence the importance of knowledge, skills, attitudes and behaviors of these people for the betterment of an organization. "People" are the key assets that are capable of bringing growth and development in an organization. Though a company does not have absolute power over this asset, they can make use of certain tools and techniques to exert some vital influence over the way they perform towards achieving the goal of the organization. "The adoption of information and communication technology (ICT) in delivering Human Resource management functions, due to the digital revolution in the world is such a tool that organizations have employed to manipulate the performance and behavior of the people on whom they rely onto achieve business success" (Kovach and Hughes 2002).

Expressed both locally and internationally through ICTs, people's sense of self are increasingly generating a shared sense of experience, beyond the confines of geographic space. Through ICTs, we are experiencing increased exposure to external influences which have deep impacts on humans and their performance (Greig, 2002). We can now experience "timeliness in a given task" the capacity to function in real-time across the world without delay and at our convenience, with blurred distinction between physical and digital experiences (Castells, 2000). The Information Age also affects us through its media and images, which alters our lives, communities, nations and states, and have tremendous impacts on our identities and our imagination (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).

Yet, recent empirical evidence from developing countries suggested that increased 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. Human resource processes should be focused on the strategic objectives. These strategies are led to prepare an IT strategic plan that in turn translates into an appropriate human resource strategic plan in the field of IT (Sameni and Khoshalhan, 2006).

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 this premises that aiding the process of finding "The impact of ICT on the efficiency of HRM in Cameroonian enterprises" is conceived.

Although there are different explanations for the absence of a relationship between ICT and efficiency (such as, the difficulty of measuring costs and benefits), we propose that, unless organizations have complementary resources, they will be unable to make the most of ICT. According to the theory of complementarities (Gargallo-Castel and Galve-Górriz 2007) we consider that the benefits will be greater if ICT is used together with the adequate organizational resources and capabilities, specifically workers' qualifications, proactive direction and innovative culture, taking advantage of complementarities.

Some authors have also attempted to identify differences on the role of IT between services and process oriented industries, and significant differences were found (Premkumer 1992). Most of the existing studies were conducted in Western

Europe and in the United States, and 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. These studies have equally verified how ICT affects the performance of HRM, Mohammed (2015) investigated the impact of ICT on HRM practices, this study seeks to contribute to literature by investigating how ICT affects the efficiency of HRM (Ability of HRM to operate faster and at a lower cost).

Moreover, in contrast to the extent of interest in these issues in other countries, mainly USA, the organizational changes and labour productivity, impacts of ICT have received little research attention, particularly in Cameroon. As a result of this, the main objective of this paper is to offer empirical evidence about the impact of ICT on the efficiency of Human Resource Management functions in Cameroonian enterprises, measured according to several efficiency measurements and taking into account the importance of complementary elements.

### **Literature Review**

The most cited theory in E-HRM was the Technology Acceptance Model (TAM). Davis (1989) presented a theoretical model aiming to predict and explain ICT usage behavior, that is, what causes potential adopters to accept or reject the use of information technology. Theoretically, 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" (Davis, 1989, p320).

Ajzen (1991) presented a theoretical model, theory of planned behavior (TPB), which focuses on cognitive self-regulation. It is very similar to the TRA model, but the difference is that it takes into account an additional construct; perceived behavioral control. Perceived behavioral control refers 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 governed by personal attitudes, but also by social pressures and sense of control. Ajzen (1991) reviews that the theory was applied for example, theory provided useful information to understand these behaviors, or to implement effective interventions to change them. The studies of Taylor and Todd (1995) and Mathieson (1991) compared the ability of TPB and TAM to explain behavior and predict an individual's intention to use ICT, respectively.

The second most cited theory in E-HRM was the Diffusion of Innovations (DOI). Indeed, Rogers' (1983) book "Diffusion of innovations" was the single most cited individual work, receiving 286 citations. 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 (1983) proposed 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 that an individual may have of adopting an information technology (IT) innovation”. The instrument was intended to be a tool for the study of the initial adoption and subsequent diffusion of IT innovations within organizations.

The Unified Theory of Acceptance and Use of Technology (UTAUT) comes to blend the above cited theories. Venkatesh et al. (2003) developed the unified model through reviewing eight models which explain ICT usage, namely 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 intentions to use ICT and the subsequent user behavior. The model considers four constructs as direct determinants of user acceptance and usage behavior, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. There are four key moderating variables: gender, age, experience, and voluntariness of use. The authors stated that UTAUT provides a tool for managers to assess the likelihood of success of technology introductions and to understand the drivers of acceptance in order to design interventions, which include, for example; training or marketing. UTAUT focuses on users who may be less willing to adopt and use new systems.

The third most cited theory was the Model of the IT Implementation Process. Cooper and Zmud (1990) took Kwon and Zmud’s (1978) model of the ICT Implementation Process and developed it further. The model is based on the “organizational change”, innovation, and technological diffusion literature. The purpose of the model is to offer a directing and organizing framework for ICT implementation research. Kwon and Zmud’s (1978) stage model comprises of six stages: initiation, organizational adoption, adaptation, acceptance and adoption, routinization, and infusion. Thus, the model covers an implementation process from the scanning of organizational needs to a full and effective use of the technology in daily practice. The model also identifies five contextual factors which impact the processes and products in each of the implementation stage: the characteristics of the user community, the organization, the technology being adopted, the task, and the organizational environment.

Information Systems Success Model: The last most cited theory was the Information Systems Success Model. DeLone and McLean (1992) reviewed prior research and introduced a comprehensive taxonomy of factors contributing to the success of information systems. The authors examined the literature on Information System (IS) success and categorized 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: This theory 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.

Human resources management (HRM) was recently 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 resources 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”.

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 relationship between HRM and productivity of industries have been extensively investigated. Mathur (2009) did financial analysis of ICT industry. He attempted to quantify the technical efficiency of the ICT in 52 countries. The proportions of the productivity growth attributable to efficiency and technical change due to ICT were also quantified. The study found that the productivity growth in the ICT sector is developing and newly industrialized countries is 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 was that the data collected from all the countries was not firm level data to determine how ICT affects the HR performance but most of the data was country level data.

In the same light with Mathur (2009), Zwick (2003) studied the impact of ICT investment on productivity for a large and representative German establishment panel data set. Those establishments without ICT capital were also included in the data set to compare the results with those having ICT capital. The data set of his study involved information on about 1400 German establishments. The cross sectional regression analysis of the data indicated that ICT investment substantially increases the average productivity of German establishments. The limitations of the study was that the corresponding size of the ICT investment was not known, the only thing known was an establishment invested in ICT.

Using the same approach, Saleem et al. (2011); attempted to measure Impact of ICT on Organizational Productivity (Efficiency and Effectiveness); which leads to Organizational Performance ( $\Delta$ Cost,  $\Delta$ Time, and  $\Delta$ Quality) using IRA (ICT role and adoption model). Barriers in ICT Adoption and impact of ICT Literate human capital on organizational productivity were also explored. The target population included computer professionals, administrative staff and faculty members of Higher Education Institutes from various geographic locations of Pakistan, including Islamabad, Lahore, Rawalpindi, Peshawar, and Multan, DG Khan and Faisalabad and some other cities. The study found significant relations of ICT adoption on the effectiveness; nonetheless ICT adoption is insignificant on efficiency; however the relationship between the two is positive. The barriers to adoption were found to be less evident. The study has some limitations too which include the sample is just from those members who were IT literate not from other areas. The quantitative analysis was just based on correlation analysis.

On his part Zafar (2009) studied the electronic HRM (e.HRM) practices in State Bank of Pakistan. The purpose of his study was to determine at which level ICT related changes are being adopted in the HR department and how they are contributing to the professional competence of the HR department in Pakistan with focus on the State Bank of Pakistan. The study identified that e.HRM practices are not yet fully visible in

Pakistan; things will take time to improve. It was also found that employees are happy with technological changes in HRM as it is making their work easier. The major limitation of this study was that the researcher focused on already available literature which did not provide any evidence from Pakistan. No face to face interactions with the respondents took place that again limits the worth of the findings.

Doran (2001) a consultant with more than 25 years of experience, insists that behind every successful HRIS implementation there is a thorough need analysis. Further, literature suggests that success in the implementation phase relies on the ability of managers to manage change. McDonagh, (2001, Spring), another organizational challenge is the creation of performance metrics to assess the value-added contribution of new HRIS initiatives (Hagood, and Friedman, 2002).

Based on this, a research paper by a Cincinnati, Ohio-based HRIS consulting firm, Insight Consulting Partners (CP), (2003), Notes that enterprise applications tend to push organizations toward more centralized and integrated HR and IT infrastructures. Thus, HRIS can support long-term planning with information on labour force planning as well as supply and demand forecasts, staffing with information on equal employment, separations and applicant qualifications and development with information on training program costs and trainee work performance. It can also support compensation programs, salary forecasts, pay budgets, labor/employee relations with information on contract negotiations, and employee assistance needs (Kovach and Hughes 2002).

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). In particular, there are three new areas of development which need more empirical research and application: the information technology innovation and e-HRM developmental approaches, the globally distributed engineering and international technology entrepreneurship, professional service, and customer relations management modeling Wang (2005). This is further supported by Shrivastava and Shaw (2004) observations that, despite evidence of increasing use of HR related technology by individual firms, there has been little theory development in this area. 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.

## **Methods**

In order to achieve the objective of this study, data was collected from the workers of the 03 (three) major telephone operators in Cameroon through the administration of a structured questionnaire. Questions were asked to capture each of the element of HRM and efficiency, the likert scale was used (1 = strongly disagree...5 = strongly agree). The choice of these enterprises is justified by the fact that this sector is concerned with the provision of information and communication technology services. These three enterprises as well account for more than 75% of the market share of the mobile telephone



industry in Cameroon and are among the first 100 enterprises in Cameroon in terms of turnover. The sample was drawn to get information from all the categories of the work force of the three enterprises; management, senior, Junior and contract staff where interviewed. Hence we administered 125 questionnaires and recuperated 120, giving a recuperation rate of 96%.

The table below (Table 1) shows the distribution of the population by staff category.

Management staff constituted 16.7% of our sample while the senior staff account for 33.3% and junior staff account 20% while contract staff make up 30% of our sample.

**Data Collection Instruments**

Self-administered questionnaire were used to collect data from respondents. The questionnaire was anchored on 5 point Likert scale ranging from “5” strongly agree to “1” strongly disagree. The interview method was used to ensure the high rates of response, as well as allowing for clarification of possible ambiguities related to questions asked.

**Questionnaire**

Since our theories show that there exist a reality (positivism) that defines the relationship between the human resource management functions and the performance of enterprises, we believed that the questionnaire will help us to a precise and authentic evaluation of the concepts. We then administered our questionnaire on 120 voluntary and available workers and some managers. A questionnaire is an instrument of investigation which, according to Ghiglione and Matalon (1978) is rigorously standardized with its text as well as its order, containing questions posed in the same manner in order to guarantee the compatibility of the responds in the research.

The questionnaire used in this research constitutes of a preamble and 02 parts the preamble had an as objective to define the theme of research, it equally constituted of some personal information of the respondents such as: age, gender, present occupation in the enterprise. The organization of the questionnaire is given below:

Part I of the Questionnaire: This part is dedicated to capture ICT tools used in the different human resources functions. Four Human resource management practices where used. Selection and recruitment, Training and development, HR evaluation and compensation, and finally Human resource planning. These HRM functions where sub divided into sub questions which permitted us to efficiently

**Table 1** Staff category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Management	20	16,7	16,7	16,7
	Senior	40	33,3	33,3	50,0
	junior	24	20,0	20,0	70,0
	Contract	36	30,0	30,0	100,0
	Total	120	100,0	100,0	

Source: computed by author from the field work

capture the contribution of these tools to performance of the different human resource practices.

Part II of the Questionnaire: This part deals with the appraisal of human resource efficiency, it seeks to evaluate how the human resources perform due to the use of ICT tools at the different levels of human resource functions. In order to capture efficiency of human resources management, different variables were used. Variables which capture the efficiency of the use of the different ICT tools were used.

A pre-test of the questionnaire was administered to 20 respondents randomly selected from the mobile telephone companies, the Cronbach alpha was used to test for consistency, and the table below (Table 2) shows the results of the Cronbach alpha test.

The results show that there is internal consistency within the questionnaire, implying the questionnaire is suitable for the study.

**Data Processing and Analysis**

Data from the field was compiled, sorted, edited and coded to have the required quality, accuracy and completeness. It was then entered into the computer using the Statistical Package for Social Sciences (SPSS v. 17.0) for analysis. The data was analyzed according to the research questions. Tables and bar charts, Pearson correlation coefficient was used to establish the relationship between the study variables. Regression analysis was used to establish the combined effect of study variables on the dependent variable. The following variables are going to be used in this study (Table 3).

Thus the following equation shall be estimated using the ordinary least square method.

$$\begin{aligned}
 \text{efficiency} = & \alpha_i + \beta \text{HR planning}_i + \gamma \text{training and development}_i \\
 & + \delta \text{Selection and recruitment}_i \\
 & + \omega \text{HR evaluation and compensation}_i + \varepsilon_i +
 \end{aligned}$$

Where  $\beta$ ,  $\omega$ ,  $\delta$  are coefficients and  $\varepsilon$  the error term

**Table 2** Cronbach alpha test

Variable	Reliability Statistics		
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Performance measurement in terms of efficiency (efficiency)	.807	.774	120
The use of ICT assures the efficiency of Human resource planning (HR planning)	.887	.800	120
ICT usage for HR functions ensure better training and development (training and development)	.905	.860	120
The use of an online platform for selection and recruitment ensure accuracy of information (selection and recruitment)	.867	.799	120
The use of computers for weekly planning of work assures efficiency of workers (HR evaluation and compensation)	.891	.801	120

Source: Author

**Table 3** The different variables of human resources efficiency

Variable	Type of variable	Description
Performance measurement in terms of efficiency (efficiency)	Dependent variable	Captures the efficiency of Human resource
The use of ICT assures the efficiency of Human resource planning (HR planning)	Independent variable	indicator of efficiency of ICT tools in HR planning
ICT usage for HR functions ensure better training and development (training and development)	Independent variable	indicator of efficiency of ICT tools in HR training and development
The use of an online platform for selection and recruitment ensure accuracy of information (selection and recruitment)	Independent variable	indicator of efficiency of ICT tools in HR Selection and recruitment
The use of computers for weekly planning of work assures efficiency of workers (HR evaluation and compensation)	Independent variable	indicator of efficiency of ICT tools in HR evaluation and compensation of workers

Source: Author's conception

### Results and discussion

Before appraising the efficiency of the use of ICT tools in human resource management, it is important to first of all look at the various ICT tools used at different levels of the human resource management practice. The graphs below shows the main tools used. A further step will be taken to examine the relationship between the variables through the Pearson correlation test before presenting the results of the regression analysis.

#### ICT tools used in selection and recruitment of personnel

The figure below shows the principal ICT tools used for the selection and recruitment of personnel.

Figure 1 above shows that 33.30% of our respondent affirmed the fact that an online application platform for reception of candidature is mostly used during selection and recruitment, while 30% and 16.70% affirmed the use of telephone calls and internet recruitment (e-recruitment) respectively. Only 20% affirmed the active use of internet connection during selection and recruitment.

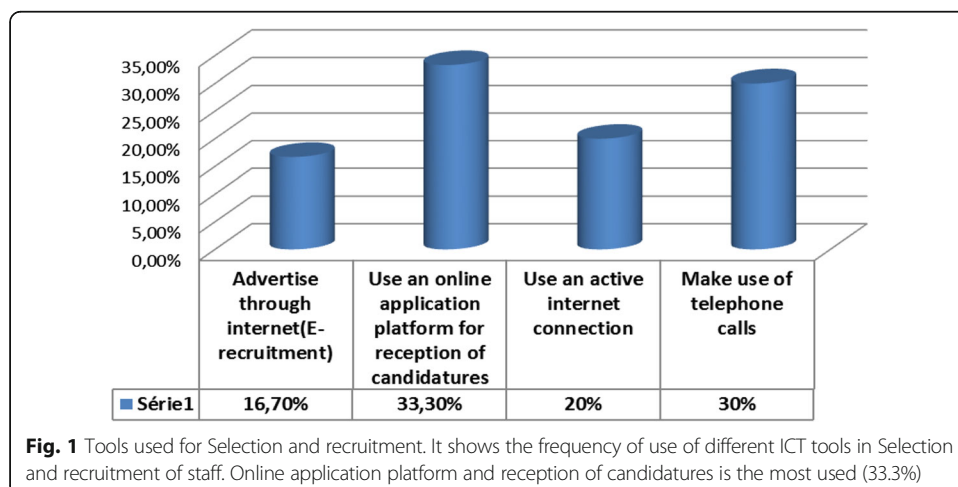
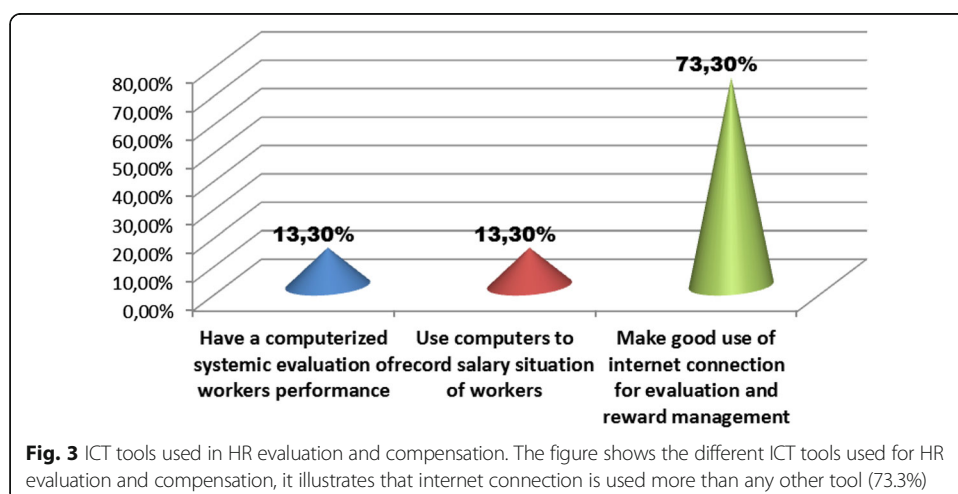
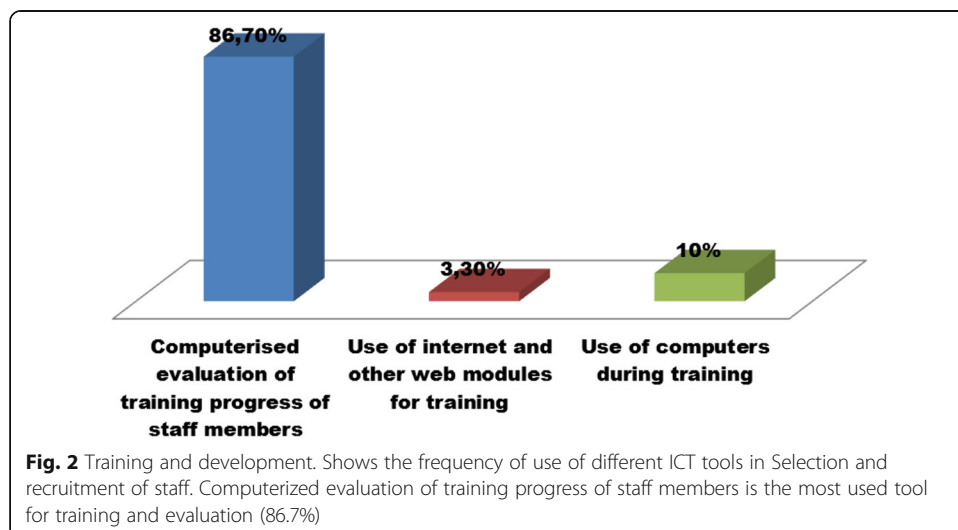
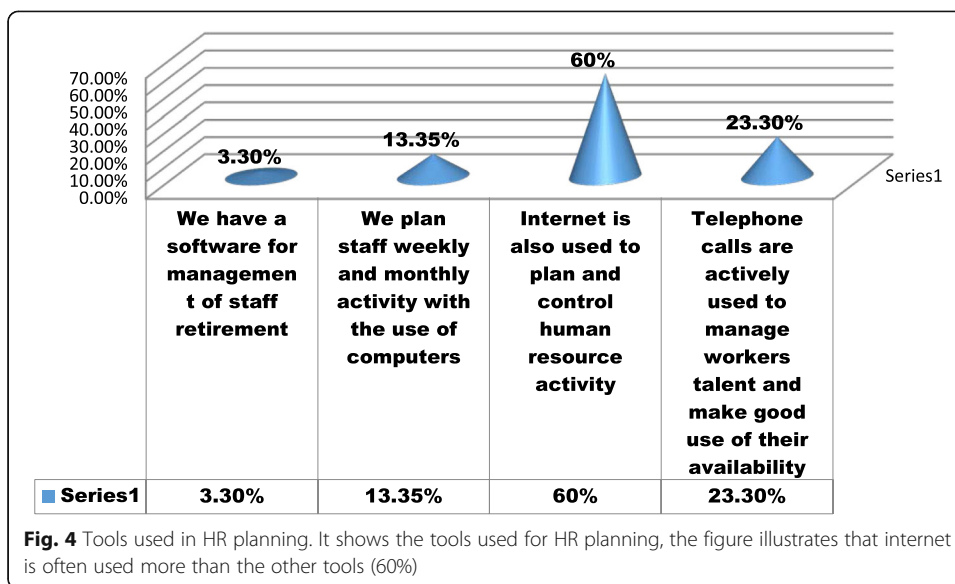


Figure 2 above show that 86.70% of our respondent affirmed that during training and development, a computerised evaluation of training progress of staff members is highly used. While only 10% and 3.30% of the respondent confirmed the use of computers and internet during training and development respectively.

Figure 3 above shows that 73.0% of are respondent affirmed that HR evaluation and compensation make good use of internet connection for evaluation and reward management, while 13.30% of our respondent respectively affirmed that HR have a computerised system for the evaluation of workers as well as uses a computer to record salary situation of workers.

Figure 4 above shows the distribution of ICT tools used in HR planning. From the figure, 60% of our respondent affirmed that HR planning makes good use of Internet to plan and control human Resources. While 23.30% affirmed the use of a Telephone call to manage workers’ talents. On the other hand, 13.35% and 3.30% respectively confirmed that weekly and monthly activities as well as management of staff retirement makes use of ICT tools during the HR planning.





### Impact of ICT usage on human resource Efficiency

Here, we are going to look at the correlation analysis and equally going to see the results of the ordinary least square regression. Correlation permits us to see the relationship between the variables of our study; it shows the level of significance between these two variables. The following table shows (Table 4) the relationship between the variables of our study.

### Correlations

Performance measurement in terms of efficiency. The use of ICT assures the efficiency of Human resource planning. ICT usage for HR functions ensure better training and development The use of an online platform for selection and recruitment ensures accuracy of information Theuseof computers for weekly planning of work assures efficiency of workers.

Here, we seek to verify the relationship between the variables of our study, that is examine the relationship between the dependent and independent variables. The result shows that the use of ICT in human resource planning leads to a reduction in the efficiency of human resource, this is significant at 1% level. There is a positive and significant relationship between the use of ICT tools in training and development of workers and workers efficiency. This is principally because ICT tools permits this training at a lower cost and at a faster rate leading to a faster acquisition of new skills.

The use of an online platform for selection and recruitment of employees exposes the position to a large number of potential employees or job seekers, this leads to the possibility for the human resource manager to select and recruit the best. This explains why there is a positive and significant relationship between these variables. This relationship is positive at 1% level of significance.

**Table 4** Pearson correlation test

Correlations		Performance measurement in terms of efficiency	The use of ICT assures the efficiency of Human resource planning	ICT usage for HR functions ensure better training and development	The use of an online platform for selection and recruitment ensure accuracy of information	The use of computers for weekly planning of work assures efficiency of workers
Performance measurement in terms of efficiency	Pearson Correlation	1				
	Sig. (2-tailed)		-.250**	.720**	.352**	.770**
	N	116	116	116	116	116
The use of ICT assures the efficiency of Human resource planning	Pearson Correlation	-.250**	1	-.296**	-.092	-.068
	Sig. (2-tailed)	.007		.001	.317	.461
	N	116	120	120	120	120
ICT usage for HR functions ensure better training and development	Pearson Correlation	.720**	-.296**	1	.025	.284**
	Sig. (2-tailed)	.000	.001		.783	.002
	N	116	120	120	120	120
The use of an online platform for selection and recruitment ensure accuracy of information	Pearson Correlation	.352**	-.092	.025	1	.249**
	Sig. (2-tailed)	.000	.317	.783		.006
	N	116	120	120	120	120
The use of computers for weekly planning of work assures efficiency of workers	Pearson Correlation	.770**	-.068	.284**	.249**	1
	Sig. (2-tailed)	.000	.461	.002	.006	
	N	116	120	120	120	120

Source: Computed by author using SPSS version 17

The use of computers for weekly planning of the activities of the human resource assures the efficiency of human resource, this is seen through a positive and significant relationship between these two variables, at 1% level of significance.

**Results Regression analysis**

Regression analysis permits us to verify the impact of each of our independent variables on our dependent variable. The Table 5 below demonstrates the results of our regression. It can be seen from the table below that the coefficient of determination R square is 0.915 which means that 91.5% of HR efficiency is explained by our independent variables. This shows that our model is good and is well explained by our independent variables. A verification on the global significance of this model is as well carried out and the results obtained show that the model is globally suitable; the critical value of our F-statistics is significantly greater than that in the table of t- statistics thus indicating that globally our model is good.

***The impact of ICT as an efficient tool for HRM Efficiency in the Cameroon context***

The regression table shows how the different human resource tools contribute to the performance of human resource.

Thus we can summarize the table in the following equation

$$\text{Performance in term of efficiency} = -3.75 + 0.184(\text{HR evaluation and compensation}) + 1.067 (\text{training and development}) + 0.380 (\text{selection and recruitment}) + 0.958 (\text{HR planning}).$$

The use of ICT in HR evaluation and compensation is efficient, a unit change in the use of ICT in HR evaluation and compensation leads an increase in HR performance by 0.184, this is significant at 1% level. This is because with a computerized system of evaluation favoritism and tribalism in evaluation is reduced since there is a

**Table 5** Regression result

Coefficients		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	-3.734	.176		-21.244	.000
	ICT assures the efficiency of HR evaluation and compensation	.184	.059	.091	3.102	.002
	ICT usage for HR functions ensure better training and development	1.067	.060	.535	17.647	.000
	The use of an online platform for selection and recruitment ensure accuracy of information	.380	.062	.203	6.145	.000
	The use of computers for weekly planning of work assures efficiency of workers	.958	.050	.593	19.063	.000
	R-Square	.915				
	Adjusted R Square	.910				
	Sig.	.000				
	n	120				

a. Dependent Variable: Performance measurement in terms of efficiency

Source: Computed by author using SPSS version 17

computerized system of evaluation, records are well kept and can easily be assessed and decisions made quickly.

ICT usage for HR functions equally stand out tall as an important factor that enhances training and development of personnel, this has a significant positive effect on the efficiency of human resource. A unit change in ICT usage for training and development would lead to an increase in efficiency by 1.067 points. Workers are now able to quickly acquire new skills and a cheaper cost especially with the coming of online education which is highly used by major corporations for the training and development of their HR.

The use of an online platform for recruitment is a significant contributor to the efficiency of HR. It permits the human resource manager to have access to the most qualified job seekers and also help them in selection and recruitment of the best staff. That is why this relationship is significant at 1% level, thus a unit change in the use of online platform for recruitment would lead to 0.380 unit change in the HR efficiency.

The use of computers for weekly planning of activities assures a good follow-up and globally the efficiency of our HR. thus a unit change in the use of computers for a weekly planning of work leads to an increase in HR efficiency by 0.958 points, this is significant at 1% level of significance.

### **Discussion of Results**

Perceived usefulness and ease of use of ICT are the principal determinants of the TAM (Davis 1989), the importance of efficiency of HR management is fundamental for organizational performance, thus the quest for technology which is easy to use becomes necessary. The results from this study highlights that the need and the ease of use of ICT tools is a principal determinant of HR management efficiency. The impact of ICT on the efficiency of HR management is hinged on a number of factors: information quality, use, system quality, user satisfaction, individual impact, and organizational impact (DeLone and McLean 1992), with this study underscoring the interconnectivity of these factors and highlights their importance in achieving efficient HR management. The use of ICT facilitates and permits the transmission of information with few errors, it's easy to use, faster and permits operations to be executed faster and this confirms the theory of information system success model. This can be accounted for by the positive coefficient of all the variables in this paper. However, Gargallo-Castel and Galve-Górriz (2007) emphasized that the success of ICT in enhancing HR management efficiency would only be possible when human attributes such as capabilities, special talent of workers, direction and proactive spirit of the workers is readily available. These results expand literature on the above theoretical underpinnings by investigating its veracity in the mobile telephone industry in Cameroon.

This paper investigates the contribution of ICT in the efficiency of the HR functions, it highlights that ICT accelerates activities, enhance fast and easy treatment of information (Armstrong, 2009). We see that ICT tools used for the different HR functions contribute significantly to the efficiency of the HR. All our variables are significant at 1% level. These results corroborates with the findings of Mohammed (2015) who studied the effect of ICT on human resource practices in Algeria, although this study instead empirically verifies the role of ICT as an efficient tool in HRM in Cameroon. The



method and instrument of our data collection as described above permitted us to verify our first proposition. We see therefore that ICT usage in HRM as an efficient tool permit the HR to execute her various functions efficiently. This is confirming at the 1% level of significance.

Globally the results of this study reveals that the use of ICT in HR recruitment, planning, evaluation, training and development enhances its efficiency, HRM operations are faster, more convenient and cheaper. These results shows that the use of ICT have a positive effect on HRM, it corroborates with the results of Kovach and Hughes (2002) who outlined 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 HRM reduces data errors, simplifies and fasten processes of HR practices, these views were supported by Ulrish et al. (2008) who confirmed in his study ICT permits professionals to spend less time on administrative tasks but on interpreting results for better organizational policy.

This study equally shows that the use of ICT facilitates HRM practices like recruitment, it is now easier for management to develop a virtual recruitment platform. It permits virtual interview, CV searching, online job announcements and psychological test. These tools makes 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 use of ICT have been a fundamental tool in enhancing training and development within cooperate bodies. It is now possible for an international cooperate body to organize a training session in the head office and all subsidiary quarters participate in the training session. This is very advantageous to the company; first it is cost efficient, the trainer would do only one training for all companies, instead of moving to all subsidiary branches. Secondly it saves time, one training is done and the acquired competences will quickly be integrated into the production process. With the development of E-training platforms it is now possible of workers to have access to individual training kits (Ulrich et al., 2008).

Development of ICT have significantly enhanced HRM planning, our results shows that ICT aided HRM planning increases 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 files.

## **Conclusion**

Traditional HRM was is characterized by a lot of errors, complicated and slow processes and heavy administrative load. This is costly and time consuming to HRM and the enterprise. The emergence of ICT and its integration in HRM have had divergent results on organizational performance, but its impact on HRM efficiency is not very clear. This study investigated the impact of ICT on HRM efficiency using the mobile telephone industry in Cameroon as a case. It was confirmed that the use of ICT tools leads to the efficiency of HR management. We went further to empirically investigate this within the Cameroon context, we first determined the major ICT tools used in the

different HR functions, we then went further to determine their impact on HRM performance measure in terms of efficiency. Using correlation and regression analysis we noticed that there is a significant positive impact of usage of ICT tools on the efficiency of HRM performance in terms of efficiency. This results shows that ICT has a significant positive effect on the efficiency of human resource management. This study have contributed to literature by extending research on impact of ICT on organizational performance to verify impact of ICT on efficiency of HRM. This study was based on the effect of the use of ICT as a tool for human resource efficiency in Cameroon with case study the Mobile telephone industry in Cameroon. Extending this research to other sectors so as to verify the divergence will be very interesting. The impact of ICT on human resource management efficiency in the public sector in Cameroon will also be very interesting.

### Limitations of the study

The first limitation of this study was lack of funds. Due to lack of funding, it was difficult to administer questionnaires to a very large sample. This makes us to limits our observations only to 120 (120 observations). This is however small when comparing or looking at similar studies of Zwick (2003) whose observation was based on 1400 sample. Equally, Access to information wasn't that easy. Self-report measures my equally portray potential personal bias.

### Acknowledgements

We thank the authorities of Mobile Telephone Network(MTN) Cameroon, Orange- Cameroon and CAMTEL Cameroon.

### Funding

Funding was from personal contribution of authors.

### Authors' contributions

SMP: designed the topic, questionnaire, analyzed and interpret the data equally wrote the first draft. NEP and NLN collected data on the field and entered the data before analysis, equally contributed to literature review. NEP proofread many times and contributed in different sections. PJT: contributed in the discussion and literature review of the paper, equally assured the language of the paper. All authors read and approved the final manuscript.

### Competing interests

There is no competing interest, all authors agree to the submission of this paper.

### Author details

<sup>1</sup>World Agroforestry Centre, Yaounde, Cameroon. <sup>2</sup>University of Yaounde II, Soa, Cameroon. <sup>3</sup>TRECEC-Cameroon, Yaounde, Cameroon.

Received: 26 August 2016 Accepted: 17 January 2017

Published online: 03 March 2017

### References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50 (2), 179–211.
- Albers-Mohrman and Lawler. (1997). Information engineering: Creating an integrated interface: In M. Smith, G. Salvendy & R. Koubek (Eds.), *Proceedings of the 7th International Conference on Human-Computer Interaction*, pp. 213–216. New York: Elsevier.
- Ange, J., & Koh, S. (1997). Exploring the Relationship between User Information Satisfaction. *International Journal of Information Management*, 17(3), 169–177.
- Appadurai, A. (1996). *Modernity at Large: Cultural Dimensions of Globalization*. Minneapolis: University of Minnesota Press.
- Armstrong, M (2009), "Handbook of Human Resources Management Practice", 8th edition. (In Czech.) Praha: Grada, 2002. 777p. ISBN 80-247-0469-2.
- Castells, M. (2000). *The Rise of the Network Society* (Secondth ed.). Oxford: Blackwell Publishing. Original publication 1996.
- Chowdhury, S.K. (2006). "Investments in ICT- capital and economic performance of small and medium scale enterprises in East Africa", *Journal of International Development*. Vol(18). pp. 533–552.
- Cooper, R.B. & Zmud, R.W. (1990). Information technology implementation research - a technological diffusion approach, "Management Science", Vol. 36, No. 2, pp 123–139.
- Currie, W. L. (1996). Organizational Structure and the Use of Information Technology: Preliminary Findings of a Survey in the Public and private sector. *International Journal of Information Management*, 16(1), 51–64.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Delone, W. H., & McLean, E. R. (1992). "Information systems success: The quest for the dependent variable", *Information Systems Research*, (3)1, pp. 60–95.

- Dewan, S. & Kraemer, K.L. (2000). "Information technology and productivity: preliminary evidence from country-level data" *Management Science*, Vol. 46 (4) pp. 548–562.
- Doran, A. (2001). "Human Resources Management System needs analysis". Retrieved October 7, 2015, from <http://www.bestsoftware.ca/News/ideabank>
- Elliott, R. H., & Tevavichulada, S. (1999). Computer Literacy and Human Resource Management: A Public/Private Sector Comparison. *Public Personnel Management*, 28(2), 259–274.
- Gargallo-Castel, & Galve-Górriz, C. (2007). "Information Technology, Complementarities and Three Measure of Organizational Performance": Empirical Evidence from Spain". *Journal of Information Technology Impact*, 7(1), 43–58.
- Ghiglione, R. and Matalon, B. (1978): Les Enquêtes Sociologiques: Théories et Pratiques. Armand - Colin. Paris.
- Greig JM. 2002. The End of Geography?: Globalization, Communications, and Culture in the Interantional System. *Journal of Conflict Resolution* 45 (2): 225–243.
- Hagood, W. & Friedman, L. (2002). Using the Balanced Scorecard to Measure the Performance of Your HR Information System. *Public Personnel Management*, Vol. 31, No. 4, pp. 543–557.
- Hendrickson, A. R. (2003). Human Resource Information Systems: Backbone Technology of Contemporary Human Resources. *Journal of Labor Research*, 24(3), 381–394.
- Insight Consulting Partners (ICP) (2003). The impact of implementing an HRIS: Are you ready for a change? Retrieved October 7, 2003 from [http://www.insightcp.com/res\\_09.html](http://www.insightcp.com/res_09.html).
- Jimoh, A. (2007). Students' Attitude towards ICT in Nigeria Tertiary Institution. *Education Focus*, 1(1), 73–79.
- Kovach, K., & Hughes, A. (2002). "administrative and strategic advantages of HRIS". *Employment of Relations today* (p. 6).
- Kuyoro Shade O. Awodele O. Okolie Samuel O (2012), "ICT: An Effective Tool in Human Development" *International Journal of Humanities and Social Science* Vol. 2 No. 7; p. 157–162.
- Kwon, T. H. & Zmud, R. W. (1978). "Unifying the Fragmented Models of Information Systems Implementation, in Bolan R. J. and R. A. Hirschheim (eds.) *Critical Issues in Information Systems Research*, New York: John Wiley, pp.227–251.
- Lal K. (2001). The determinants of the adoption of Information Technology: A case study of the Indian Garments Industry. DOI: <http://dx.doi.org/10.1093/acprof:oso/9780199243983.003.0007>.
- Lim, M. (2003). From Real to Virtual (and Back again): The Internet and Public Sphere in Indonesia. In K. C. Ho, R. Kluver, & K. Yang (Eds.), *Asia Encounters the Internet* (pp. 113–128). London: Routledge.
- Mathieson, K. (1991). "Predicting user intention: comparing the technology acceptance model with theory of planned behavior", *Information Systems Research*, vol. 2, no. 3, pp. 179–191.
- Mathur, K. (2009). "Financial Analysis of the ICT Industry: A Regulatory Perspective". *Journal of Infrastructure Development*, 1, 17.
- McDonagh, J. (2001). Not for the faint-hearted: Social and organizational challenges in IT enabled change". *Organization Development Journal*, 19, 11–20.
- Mohammed Elhazzam (2015) "The Effect of ICT on Human Resources Management Practices" *International Journal of Innovative Research in Engineering & Management (IJIREM)* ISSN: 2350–0557, Volume-2, Issue-3, May-2015.
- Moore, G. C. & Benbasat, I. (1991). 'Development of an instrument to measure the perception of adopting an information technology innovation', *Information Systems Research*, vol. 2, no. 3, pp. 192–223.
- Othman, R., & Teh, C. (2003). "On developing the informed workplace: HRM issues in Malaysia". *Human Resource Management Review*, 13(3), 393–406.
- Premkumer, G. (1992). An Empirical Study of IS Planning Characteristics among Industries. *OMEGA*, 20(5/6), 611–629.
- Rogers, E.M. (1983). *Diffusion of Innovations*, 3rd ed., The Free Press, New York, NY.
- Saleem, I., Qureshi, M.Q., Mustafa, S., Anwer, F., & Hijazi, T. (2011). "Role of Information and Communicational Technologies in Perceived Organizational Performance": Empirical Evidence from Higher Education Sector of Pakistan. *IBA Business Review*, 6(1), 81–95.
- Sameni, M. K., & Khoshalhan. (2006). "Analysis of Human Resource Development for Information Technology and E-Commerce in Iran". Tehran: IT Department, Faculty of Industrial Engineering, K.N.Toosi University of Technology.
- Schuler, R. S. (1990). "Repositioning the Human Resource Function": Transformation or Demise? *Academy of Management Executive*, 4(3), 49–60.
- Seyal, A. H., Rahim, M. M., & Rahman, M. N. A. (2000). "An Empirical investigation of Use of information technology Among Small and medium Business Organizations: Bruneian Scenario". *The Electronic Journal on Information Systems in Developing Countries*, 2(7), 1–17.
- Shields, R. (2003). *The Virtual*. London and New York: Routledge.
- Shrivastava, S., & Shaw, J. B. (2004). Liberating HR through technology. *Human Resource Management*, 42(3), 201–222.
- Stone, D. L., Stone-Romero, E. F., & Lukaszewski, K. (2006). "Factors affecting the acceptance and effectiveness of electronic human resource systems". *Human Resource Management Review*, 16(2), 229–244.
- Ulrich, D. (1997). "Human Resource Champions: The Next Agenda for Adding Value and Delivery Results". Harvard Business School Press.
- Ulrich, D., Younger, J., & Brockbank, W., Johnson, D. (2008). HR Competencies: Mastery at the Intersection of People and Business . Alexandria, VA: Society of Human Resource Management. DOI: 10.1093/acprof:oso/9780199243983.001.0001.
- Valverde, M., Ryan, G., & Soler, C. (2006). "Distributing HRM responsibilities: a classification of organizations". *Personnel Review*, 35(6), 618–636. Ns.
- Wang, S. (1997). Impact of information technology on organizations. *Human Systems Management*, 16, 83–90.
- Wang, Z. (2005). "Organizational Effectiveness through Technology Innovation and HRM Strategies". *International Journal of Manpower*, 26(6), 481–487.
- Walker & Watson (2002). E-HR: Getting results along the journey. Retrieved October 7, 2003, from <http://ise.atilim.edu.tr/shares/personel/197/Information%20Technology%20in%20Human%20Resource%20Management-An%20Empirical%20Assessment.pdf>.
- Zafar, J. (2009). "E -Human Resource Management: A case study of the State Bank in Pakistan". *Management review*, vol. 64, p. 29–31.
- Zwick, T. (2003). "The impact of ICT investment on Establishment productivity". *National Institute Economic Review*, vol. 184, p. 99–110.