# Towards  Organizational Transformation in Developing Countries: Enterprise Content Management in  Rwanda

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**Abstract.** E-government development is more advanced in developed countries compared to developing countries. Organizational transformation by e-government in developing countries is still at infancy stage. Incremental or radical changes seem to be a subsequent stage in settings where technological implementations are still fresh like in developing countries. In a journey towards organizational transformation, this research work, using design science research, aims 1) to find critical factors influencing implementation of enterprise content management (ECM) in Rwanda as one of the developing countries, 2) to carry out an investigation on how these factors are related to literature in order to detect e-government development stage and 3) to eventually propose a next step towards organizational transformation. Preliminarily results show that implementation of ECM in Rwanda has been focusing on deploying a technical tool in government organizations and this implies that work processes re-design and change management are imperative. The overall contribution of this entire study in progress is two-fold: 1) to suggest a practical way in solving some issues related to efficiency in  administrative activities for practitioners towards organizational transformation in a developing country and 2) to create new knowledge for e-government researchers on organization matters especially in developing countries.

**Keywords.** E-government, implementation, organizational transformation, business process re-engineering, Rwanda

## 1. Introduction

Drawing from a UN survey [1]and  looking at  e-government  development stage  studies, i.e. Layne and Lee[2], e-government development in developing countries [3] is  behind that of developed nations. As defined by Layne and Lee's model[2], the second stage which is transactional is not yet fully reached by  the majority of  developing countries.

Two studies, one in Sub-Saharan Africa and another in an Asian country – the continents where majority of the developing countries are located – Nkohkwo and Islam [4] claim  that the most e-government related challenges in Sub-Saharan Africa include ICT infrastructure, human resources, legal framework, internet access, the digital divide,

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and connectivity. The study in Asia [5] points out the issues of ICT infrastructure, the lack of ICT literacy and inability to access e-government services using local languages as problems in some Asian developing countries [5]. Furthermore in the Caribbean, for instance in Jamaica, ICT infrastructure, privacy and security, culture and the digital divide and financial issues are the factors undermining e-government implementation [6]. From these three studies above, the factors affecting e-government are general ones at national or regional level. In addition to that, other studies on developing countries focus on e-government adoption [7-11] mainly from citizen perspective, and e-services [12-16] and studies on organizational issues are limited in number even though these appear to be the ones mostly and directly affecting e-government implementation [17-19].

Therefore, my study started out to find factors influencing the implementation of an enterprise content management (ECM) system labelled "Document Tracking and Workflow Management System" (DTWMS) in Rwanda as a developing country I am very familiar with. As described in [20], Rwanda , being a unitary state with a central government initiating IT projects, has an ambitious modernization plan where IT has to play a major role. This   includes a long-term 20-year economic development plan ("Vision 2020") as well as medium-term strategy ("Economic Development Poverty Reduction Strategy") and the National Information Communication Infrastructure (NICI) Plan. Together these plans aim to transform the country from an agrarian economy to an information-rich and knowledge-based middle-income country by 2020 [20].  Key actors in the NICI Plan are the Ministry of Youth and ICT at e-government policy and strategy level, Rwanda Development Board/IT (RDB/IT) department at the level of project co-ordination and implementation, and Rwanda Utilities Regulatory Agency (RURA) as the national ICT Regulating Agency[21].  Rwanda ranks 125 out of 193 UN member states but ranks top among least developed countries [1] as far as e-government development is concerned.

Being motivated by the scarcity of research on e-government, particularly on organization in developing countries, the main research question of my work is:
What are current e-government organizational issues and how can improvements be made   towards organizational transformation using ICT in a developing country?   This is broken down into six sub-questions:

1) What are the critical factors in implementing Enterprise Content Management Systems in Rwanda?
2) How are the critical factors found related to success factors in literature?
3) What are issues related to ICT -enabled organizational change in developing countries?
4) What is the current state of ICT enabled Organizational change in Public Sector in Rwanda?
5) What improvements could be developed via business process re-engineering (BPR)?
6) How can these BPR-based improvements be implemented in Rwanda?

## 2. Related work

ICT has a potentiality to transform an organizations [22] , however e-government implementation is directly affected by organizational issues as it was pointed out by different researchers due misalignment between technology and organization processes,

adaptability or other issues related to user organization itself. For instance,   a mong many studies conducted on developed countries, for instance, vom Brocke, Simons, and Cleven claimed that key challenges of enterprise content management systems adaptation processes are rather organizational than technological[23]. Alignment between organizational businesses and technology is one issue, and organizational change and change management is another.

But what are IT systems or ICTs mostly used in organizations? Enterprise Content Management (ECM) Systems, Enterprise resources planning systems (ERP), finance management systems other similar information systems[26], Payroll systems  are those frequently used in organization . When it comes to ECM,  it may include all or some components from documents imaging (DI), documents management (DM), records management (RM), workflow/ and business process management (W/BPM), web content management (WCM), knowledge management (KM), digital rights management and digital assets management [27].

As for ERP, it is a category of business-management software—typically a suite of integrated applications—that an organization can use to collect, store, manage and interpret data from many business activities, including: product planning, purchase, manufacturing or service delivery, marketing and sales, inventory management, shipping and payment[28].

 When it comes to organization transformation, the concept of business process re-engineering also called business process re-design is important. Since 1990's there has been a growing research interest on business process re-engineering also 're-design used' (BPR)- "a strategy-driven organizational initiative to redesign business process to improve and achieve competitive advantage in performance" [29,p.129]. BPR application started in   the private sector and was embraced later in the public sector from the last decade, where from 'Sweden to Spain and from Portugal to Greece', the reform of policies was done as to adjust to 'new managerial practices', with ICT use in this case, efficiently and respond to the needs of citizens effectively [29].

Looking  at ICT-enabled organization change but now in developing countries, ICT adaptability and organization transformation is still a challenge in developing countries. For instance, Nurdin, Stockdale, and Scheepers [30] in their study on India and Indonesia, claimed that for a sustained IT implementation,  business processes are to be adjusted to 'new technology requirements' which reduces  physical contacts, this implying  aligning  back and front office[30].

But, what are current e-government organizational issues and how can improvements be made   towards organizational transformation using ICT in a developing country? In the next section, follow a methodological approach to operationalize the research question.

## 3. Methods

### 3.1 Case Study Description

Empirical research is being carried out in the context of a developing country, Rwanda, from central and local government agencies where the central government mandates implementation of a number of IT projects through the ministry of Youth and ICT at policy and strategy level, and Rwanda Utilities Regulatory Agency (RURA) as the national ICT Regulating Agency, and Rwanda Development Board (RDB) IT

department at project co-ordination and implementation level. These IT projects are rolled out from central government to local government agencies. Apart from project co-coordination, RDB IT deals with IT vendors for procurement, develops and customizes software programs, and conducts trainings for central and local government staff on the use of developed or procured software systems. As RDB implements these projects, they focus on implementing IT systems hoping that the public sector agencies will adopt and use them. Experiences so far show that use of the systems is very limited.

## 3.2 Methodological approach and constituent studies

This research work use design science research (DSR) as a methodological approach, following the five steps: 1) awareness of problem, 2) suggestion, 3) development, 4) evaluation and 5) conclusion where the knowledge of a part of the study informs the subsequent part [31]. However, this research work will consists of the four DSR steps but step 4 "Evaluation" covered partly. This project consists of four studies:

1. E-Government Implementation in Developing Countries: Enterprise Content Management in Rwanda( which is a completed study)
2. Investigating issues related to ICT-enabled organizational change in developing countries
3. Beyond deployment of ICT systems: Situation of Organizational Change and Business Re-design in Rwanda
4. Organizational Business Re-organization Proposal and implementation of improvements in Rwanda

Study 1: I used interviews with respondents being employees working in two ministries and eight districts in Rwanda and document analysis to answer to the first and second research question. These were analysed mainly qualitatively but also a quantitative analysis was performed to compare with findings in the literature for second research question. The study, addressing the first two research questions, was based on semi-structured interviews with 56 people – 26 managers, 17 users, and 13 IT staff – in ten public organizations in Rwanda, eight in local government and two in central government. Ten organizations were selected based on system usage data, which is regularly retrieved by the RDB IT department. Data from February to May 2014 from 50 organizations was available. We selected the three ones (one ministry and two districts) who had the highest use (700-1000 document transactions per month), and seven (one ministry and six districts) with low use (0-40 transactions per month). There is insignificant difference between the eight districts in terms of population size and the number of staff per each district. The selection of individuals was based on their involvement in the DTWMS project in their respective organizations and their availability to participate in interviews. In nine of the organizations 4-8 people were interviewed, in one it was only one person. The published models in literature for success factors in ECM and ERP implementation i.e. the Horne and Hawamdeh theoretical framework [32] and the work of Norton[33] were used for to answer the first and second research questions, respectively. Those models were chosen because they are recent and comprehensive. This study one is at DSR problem awareness stage in order to have insights into e-Government system implementation problem in public sector in Rwanda in general.

Study 2 will address the third research question on literature review- study whose research question is "What are issues related to ICT -enabled organizational change in

developing countries?" This study serves to gather theoretical aspects on ICT-enabled organization change in developing countries.

Study 3 will address the fourth research question, "What is the current state of ICT enabled Organizational change in Public Sector in Rwanda?" the question is to be addressed by using interviews and analysing documents. The framework by Ward and Elvin [24] and socio-technical theory [25] will be followed in the study. This study three is also at DSR problem awareness stage in order to have insights in the problem of ICT-enabled organizational change in Rwanda.

Study 4, to answer question five and six. Question five will addressed    in a three-stage process:

a)   Working with focus groups in a few selected government agencies, we will review and document the present processes (including a partial use of ICT)

b)   Continuing with the focus groups we will design a set of amended or new business processes for efficiency documented in UML for 1) small, 2) medium, and 3) radical change, using also new ICT functionality (to be procured or developed)

The proposed solutions will also be documented using storyboards and presented to groups of staff (potential users and managers in a few government agencies) inviting them to comment and give evaluations using questionnaires.

For question six, it will be a feasibility study on the possible implementation of the scenarios developed in responding to question five. In this work I will investigate the possibilities of using the technologies available by the organization, to be procured or developed. It will also address the steps of reorganization needed for implementation. I will here interact with the IT professionals, users and managers of the user organizations and at Rwanda Development Board. Study 4 fit with DSR stage number two, three: "Suggestion, Development" and part of step four i.e "Evaluation".

In the four studies three information system artefacts [34] namely Technology artefacts (such as hardware and software), Information artifacts (such as information exchanged) and Social artifacts (people attitude and interaction in the workflow settings) are to be investigated to some extent.

## 4. Preliminary results

The results presented in this section relate to "problem awareness" step in the design science approach. The findings in study one prepares for subsequent DSR stages to be tackled in other remaining studies.

Out of the 40 factor elements  in the literature in Horne and Hawamdeh [31] (also used as a  framework to categorize the critical factors in the case study), respondents grouped into three categories (managers, users, and IT professionals) mentioned 14 factors  grouped into five categories which are  1)User factors ( User Involvement in IT system improvement, User Perception of System Advantage, Training , User Perception of System complexity), 2) Task related Factors(Project Management Plan, Change Management Plan, Project Cost Planning, Post- implementation Evaluation Plan, Building a Business Case), 3) Technological Factors (Technical infrastructure, Business Process Re-engineering, , System Quality) 4)  Content factor(Digital Signature) 5) Managerial factor(Top management Support). In each factor category, factor elements

in parenthesis are ordered according to frequency of all respondents (from high to low frequency).

User factors followed by task related factors were mentioned most frequently by the respondents. Regarding the most occurring factor elements such as "User Involvement in IT system improvement", "change management" and "technical infrastructure", response percentage show that in general all three respondent categories were in agreement on those factors which pertained directly to all of them. Some factors, like project management plan, were mainly mentioned by those directly involved with the project, i.e. managers and IT professionals.

**User factors.** The respondents strongly point out a lack of user involvement in the IT system improvement. A second major factor was the perceived lack of advantages for the users, even though managers were considerably more positive on this point than the actual users themselves. The numbers suggest that the training need was more related to aligning technology with work processes and achieving benefits than system complexity. Users mentioned issues like incomplete system requiring much double work, such as first scanning documents to process them and then printing them for signing.

**Task-related factors.** There seemed to be a lack of strategy regarding how to make efficient and effective use of the system. Respondents mentioned users being resistant to use, lack of buy-in among managers, and, limited 'follow up' about use of the system. Others mentioned lack of plans for change; the system is not 'mandatory', there is no policy about the system of document tracking in their organizations, neither internal in the organizations or as part of the performance contracts.

**Technological factors.** Technical infrastructure is the most mentioned factor; exemplified by Internet disconnection, power cuts or other technical issues of the system and network. In particular system users called for analysis and redesign of processes and workflow so as to improve efficiency of work processes and to retain staff; some respondents mentioned issues related to a lot of work, imbalance in work distribution among other issues.

**Managerial factors.** While not the highest ranked factor, a lack of top management commitment and support was identified among all respondent groups. Organizations managers and unit managers in those organizations were criticized for not 'encouraging' or 'stimulating' or 'supporting' use of the system. Some managers also admitted to have no policy regarding system implementation.

**Content factors.** The lack of an electronic signature system was mentioned as managers and users alike found this to be the main reason behind the double work caused by the failure to reduce printing. Low users mentioned User involvement in IT system improvement as the number one factor while this came as number four by the high users. Conversely the high users had Change management most frequently and this appeared as the fourth most frequent factor by the low users.

## 5. Discussion and Conclusion

User issues appear on top of the list as defined by the respondents and use of the system of DTWMS varies a lot and is limited. It appears users do not see advantages of the system and the project management plan is unclear. The DTWMS is procured and implemented by a central government IT organization on central government order and this may explain partly the observed little management commitment and support in the government organizations where the system is to be used. Furthermore there is no known

plan for work process re-design, improved performance as the project is so far only about implementing a technical system. The pig picture from the ranking of factors shows a situation of organizations at infancy stage of e-government development.

Looking at the situation this appears to be the right moment when organizational change ingredient should be brought in. The change plan should be clearly defined for next step towards the efficiency and effectiveness in administrative activities for the benefit of citizens.

The study set out to investigate how critical success factors found in literature on IS implementation of information management systems relate to findings in the Rwanda public sector. The findings indicate that they do however it is not enough to take the latest findings in literature as the blueprint for success. Yes, it has been a necessary step to take first to make the ball roll in focusing on technology in early stage. However at this point, work processes re-design, and change management are imperative for government organizations in Rwanda in a journey towards organizational transformation.

The findings in the first study and those to be found in the second study serve for problem awareness and inform the next studies i.e. study three and study four on the suggestion and design for a solution proposal towards organizational transformation in a developing country like Rwanda. The overall contribution of this entire study in progress is 1) to exemplify and suggest a practical way in solving some issues related to efficiency in administrative activities for practitioners towards organizational transformation in a developing country and 2) to create new knowledge for e-government researchers on organization matters especially in developing countries.

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