Towards Open Government in Morocco: Fez Empirical Case

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One defining feature of the 21st Century is the growing diffusion of Information and Communication Technologies (ICT) worldwide. These are not only changing the world but also changing features and characteristics inherent in ICT design. A second ICT generation: Web 2.0 is facilitating new possibilities in governance. Respectively called 'Openness,' it is an emerging trend in ICT domains, revealing new possibilities and presenting new challenges. Through empirical analysis this article assesses some aspects of Openness. Its purpose is to contribute the experiences of a research triad consisting of the public-private collaborative of the ICT for Development Research Laboratory at Al Akhawayn University in Ifrane, the City of Fez, Morocco, and the Canadian Organization: International Development and Research Centre. The triad began working on Fez e-Government Project and then Wireless Metropolitan Area Network at Fez (wman@fez); and the major outcome was collaborative organized research action initiating real-life introduction of a shift towards Open Government in Morocco. This article presents some multi-level achievements and discusses certain challenges (at the local and national levels) restricting the optimum gain and public value estimated from ICT-facilitated Openness.

1. Introduction

The growth of Information Technologies (IT) and Information and Communication Technologies (ICT) have been changing and shaping facets of modern life. Aronson's study (2001: 541-558) outlines *la longue durée* of ICT growth. The wave of ICT started as early as 1843 with the invention of the telegraph and grew with the succession of the telephone, radio, television, computers, e-mail, and culminating with the internet's World Wide Web (542). These ICT developments and related diffusion launched what is called the 'information revolution.' It meant "the rapid technological advances in computers, communications, and software that in turn have led to dramatic decreases in the cost of processing and transmitting information" (Nye, 2000: 197). The information revolution led to new terms like 'the information age', 'the information society' and 'the knowledge society' (Scholte, 2001: 20).

With inequality persisting in a constantly changing world, global organizations adopted several measures to connect ICTs with development goals. Unwin (2009) surveys this event-driven phenomenon. These events were launched in 1984 with the Independent Commission of the International Telecommunication Union whom submitted a final report entitled "The Missing Link" or the Maitland Report. The report called for telecommunication liberalization in facilitating growth and availability of telephony benefits. The World Bank created the Information for Development Program in 1995. The program was designed to support implementation of ICT initiatives in developing countries. The mid 1990s also had several events that promoted dialogue, reflection, and collective action, like the 1996 Addis Ababa ministerial conference of the Economic Commission of Africa. This conference launched the Africa Information Society Initiative (AISI). The Group of Seven Industrialized Nations (G7) also had an influential role; their meeting at Brussels in 1995 encouraged 'the innovation and development of new technologies' and launched eleven new projects. One G7 member, Canada, led pioneering contributions. Canada's International Development Research Centre (IDRC) showed an avid interest in ICT and its power to generate development. After series of discussions in Italy, the IDRC set in motion the 'Bellanet' Initiative in 1995. The initiative uses ICT for sustainable development research. The following year the Information Society and Development Conference provided opportunities for further dialogue. This ushered in the Acacia Initiative "which was designed to focus on empowering poor African communities through research, development and demonstration" (Unwin, 2009: 129). Canada continued in a leading role, setting and advocating an agenda that connects ICTs with development. In 1997 the first Global Knowledge Conference was held in Toronto with the theme 'Knowledge for Development in the Information Age.' The meeting generated several results including a development body called the Global Knowledge Partnership (GKP). Support for this work was voiced later in the 1998-1999 World Development Report, which advocated 'Knowledge for Development.'

International Organizations paved the way for major events to unfold in 2000. The World Economic Forum launched the Global Digital Divide Initiative. The second Global Knowledge Conference, held in Malaysia, constructed an action plan focusing on issues of access, governance and empowerment for the GKP to implement (Unwin, 2009: 131-132). In July 2000, the United Nations and G8 (successor to the G7) met in Kyusu and Okinawa, Japan. They created the Digital Opportunity Task Force (DOT Force), and issued the Okinawa Charter which advocates Information Communication Technologies for Development (ICT4D) as a priority of the global community. Okinawa voiced "the idea that, given the right context, ICTs can be important tools for addressing global and national inequalities. The focus is shifting from understanding ICTs as pure technologies to be used in addressing specific needs (the project approach) to a holistic approach that sees ICTs as key development enablers" (UNDP, 2001). This reflects the view that development is a process fostered by ICTs. In this sense, ICTs provide opportunities for development endeavours. Development areas where efforts were steadily deployed to connect 'D' to ICT include government and governance, poverty alleviation, ecological monitoring, environmental

management, and health (UNDP, 2001: 3). ICT4D discourse was further endorsed with the Millennium Summit held in September. The Summit brought together heads of State who agreed on and supported the Millennium Development Goals (MDG). The eighth MDG vowed to 'develop a global partnership for development.' The objective is to 'cooperate with the private sector and allow the benefits of new technologies to diffuse-especially information and communication technologies.' In the light of these events and initiatives, the international community gathered momentum to support and pursue ICT4D.

With the rise of ICT4D perspectives changed. Unwin differentiates between IT, ICT, and ICT4D in these terms, "Unlike IT and ICT, where the main focus is on *what is* and *what can be* achieved, ICT4D is about what *should* be done and *how* we should do it. ICT4D therefore has a profoundly moral agenda. It is not primarily about the technologies themselves, but is instead concerned with how they can be used to enable the empowerment of poor and marginalized communities. This is a shared agenda and involves reflection on behalf of all those who aspire to make the world a fairer and better place" (2009: 33).

After almost a decade of implementing ICT4D initiatives and experiments around the globe, the discourse has proliferated over its conceptual scope. Ideas and new hypotheses have arisen from praxis observations and lessons learned. One recently coined concept is Open ICT4D; where 'openness' is defined "as a way of organizing social activities for development benefits that favour a) universal over restricted access to communication tools and information; b) universal over restricted participation in informal and formal groups/institutions, and c) collaborative over centralized production of culture, economic, or other content" (Smith et al, 2008).

This article critiques the use of Openness for ICT through empirical observation. It shares the experiences of the following triad: the public-private collaborative partnership between (1) the ICT4D Research Laboratory at Al Akhawayn University in Ifrane, Morocco (AUI); (2) the City of Fez, Morocco, and (3) the financial support of Canada's International Development and Research Centre (IDRC). This triad started working on the Fez e-Government Project (or eFez) in 2004. The major outcome was a shift from the archaic local administration based on former colonial practices to an Open Government in Morocco. eFez used open source technologies; followed open design-implementation guiding principles via the 'co-creation' and 'pro-sumption' of government citizen-oriented electronic services; promoted open practices in local government offices (known as *Bureaux d'Etat Civil* or BEC), and allowed direct access to citizen-oriented records and certificates through first-time introductions of self-service technology at the local scale. Within Morocco's context openness-facilitated innovations in public service delivery have triggered socio-organizational changes. These had generated greater public interest and value of local administrations, namely recognizable improvements in certain day-to-day operations. The positive response has nurtured new projects like the IDRC-funded research project, Wireless Metropolitan Area Network at Fez (wman@fez). The joint-venture is furthering openness and sophistication in Fez real-life practices of Open Government in Morocco.

This article sets out the authors' experience with, and reflection on, the application of certain openness processes. It presents some multi-level achievements of Fez real-life experience that enabled the shift towards Open Government in Morocco and discuses the challenges (at the local and national levels) that sometimes promote and other times inhibit the optimum gain and potential value generated from ICT-facilitated Openness.

2. eFez Context

Morocco expressed interest in ICT since the beginning of the 1990s (SEPTI, 2006). It successfully pursued telecommunication liberalization which expanded telephony presence in Morocco (ANRT, 2009). There were drawbacks to this. The elaboration of Morocco's e-government national strategy proved time-consuming, taking at least twelve years to gather momentum (1993-2005) (SEPTI, 2007). One consequence of this delay is the absence of concrete ICT actions to benefit the daily life of ordinary citizens (Moubsit, 2007). Accordingly, Moroccans grew increasingly disenchanted with Morocco's performance in e-Government. They described the delay as 'e-Stagnation' (Dechanet and El Yaakoubi, 2009) which persisted regardless of national investments amounting to two billion 400 million MAD between 2005 and 2008 (official figures) (MMSP, n.d.). Ranked at 140th in an UN 2008 eGovernment Survey, Moroccans' had reason for their disappointment (UN, 2008).

Cognizant of the pressing need to integrate 'the knowledge society'; concerned with Morocco's e-Stagnation (starting quickly after the increase in telephony penetration by 2005) (Dechanet and El Yaakoubi, 2009), and convinced with the urgency to meet the requirement of using ICT as a "enabler/booster" in Morocco's development, the research team at Al Akhawayn University in Ifrane (Information and Communication Technologies for Development - ICT4D) promoted and introduced ICT systems in local public administrations. This was done with the goal of improving institutional effectiveness in delivering citizen-oriented services. Financial support came from the International Development Research Centre (IDRC/Canada), which is a leader in supporting research in developing and less developed countries. Accordingly, AUI-IDRC partnership started in 2004 with the overall objective of leading ICT4D efforts to support Morocco's local public administration.

Fez municipality collaborated with ICT4D Research Team to address and ameliorate Morocco's ICT diffusion related concerns. The project team (i.e. Fez municipality and ICT4D lab) foresaw the necessity of a real-life pilot e-government project to build a framework for ICT and explore challenges in ICT implementation. Accordingly the project team launched eFez project in 2004 and successfully completed a pilot e-government system/platform: electronic Fundamental Etat-civil System (eFES) in November 2005, funded by the IDRC and deployed in the local administration of Fez. Thanks to eFES pilot platform demonstration effects, eFez had a second phase (2007-2009 funded by the IDRC) to upscale its research findings and knowledge production.

3. What is eFES platform?

Building an e-Government system for BEC enables electronically the issuance of a set of citizen-oriented services. BECs are in charge of keeping official records of citizens' life events such as birth, marriage, divorce, and death. Specifically, BECs consist of an automated back office and the front office that offers a web portal and touch screen kiosk for public use and adapted for illiterate and literate users. The ICT4D team and eFez partners, within a PPP (Public-Private-Partnership) environment, co-created an eFES platform with two complimentary building blocks:

1. eBEC administration component, which automates back-end operations and processes to streamline employees' work; and ...
2. eBEC services component, which enables BEC electronic front-end to allow citizens to have convenient, speedy, transparent, and easy access (i.e. request/receipt) to necessary documents.

3. Rational of eFez Area of Intervention

In contributing to Morocco's ICT matters the ICT4D research team built a local eGovernment system focusing on local public administration. Consultations and deliberations with Fez partners revealed need for an ICT based system to meet the deficiencies in local administrations delivering citizen-oriented services, specifically issuing life events certificates (Kettani and El Mahdi, 2008c). They are called BECs in Morocco as mentioned previously in this document. Life events certificates are vital for Moroccans from all backgrounds. These certificates facilitate access to professional and personal opportunities (e.g. employment openings in the formal sector) (Kettani et al, 2009a). Yet these local administrations are constrained by customary bureaucratic protocols still present in Morocco's administrations; like many other developing countries (Hyden, 1995). The capacity to serve citizens effectively is limited by a process of manual recoding and the paper-based storage of citizens' records (Kettani et al, 2008b).

Moroccan BEC offices are commonly referred to as the heart of administration, simply because BEC houses and processes citizens' life events. They verify and provide testimonial to peoples' nationality, citizenship, and identity. This explains why BEC offices were a subject of interest for ICT automation within the Maghreb Region. In fact, the *Association International des Mairies Francophones* (AIMF) initiated in 1991 the automation of the *Etat Civil* in Tunisia, specifically in the Tunis Municipality (AIMF, 2005: 37). AIMF directed a private company to develop the software necessary to digitize and manage citizens' records. The automated system, called MADANIA, cost 259.163,33 Euros and was inaugurated in 1993 (AIMF, 2005: 7). In 1994 AIMF replicated the Tunisian pilot experience of *Etat Civil* automation in Morocco in Casablanca, Marrakech, Meknes, and Rabat for budgets respectively of 381.122,54 Euros; 137.204,12 Euros; 83.371,45 Euros, and 92.000 Euros (AIMF, 2005: 29-30). AIMF adjusted the Tunisian BEC software to Morocco's legislation. These adjustments led to changing the whole architecture of the software due to enormous differences between Tunisian and Moroccan BEC legislation. As of present none of these BEC automation initiatives function. Fieldwork and talks with actors in Casablanca, Marrakech, Meknes, and Rabat revealed that BEC service delivery continues in a manual and paper based manner. No ICT is used.

Regrettably, the AIMF project was abandoned in these Moroccan cities. Importing the ICT-based system from Tunisia to Morocco's rigid BEC structure is a common citied reason for the failure. The literature review, however, more complex explanations for why such projects fail. Ragu-Nathan notes, "most off-the-shelf ICT applications used in present organizational environments cannot be used 'as is' without major modifications. The implementation of enterprise resource planning systems, for instance, requires making important decisions about configuration and customization, which is often a highly political and stressful process"(2008: 422). Carayon-Sainfort highlights incidences of application failures (1992). Weil and Rosen stress difficulties end-users go through with programming faults and loss of data (1999). In fact such experiments had negative consequences on BEC senior officers nationwide, viewing ICT as unsuitable for their workplace.

Mindful of Morocco's ICT stagnation and recognizing BEC personnel cynicism towards ICT, the research team built a real-life eGovernment system (i.e. eFES platform) in an 'action research' mode. First coined by psychologist Kurt Lewin in 1949, Buskins and Earl explain what action research is, "Nowadays, the term emancipatory action research is applied to a variety of approaches that focus on participative inquiry and practice for social development." They further develop the term, explaining that it, "seeks to use knowledge processes to inform action" ... and ... "In an international development context, action researchers seek to improve the lives of marginalized people both through the process of enquiry as well as through the practical application of the research findings " (2008: 175).

4. eFez Intervention Framework

The ICT4D research team structured its action research intervention along a framework of four interrelated phases:

1) Creating and sustaining favourable conditions for the project implementation;
2) Inception;
3) Development and deployment of ICT/eGov system; and
4) Systematic assessment of project outcomes.

eFez four-phase framework is graphically depicted in the chart below:

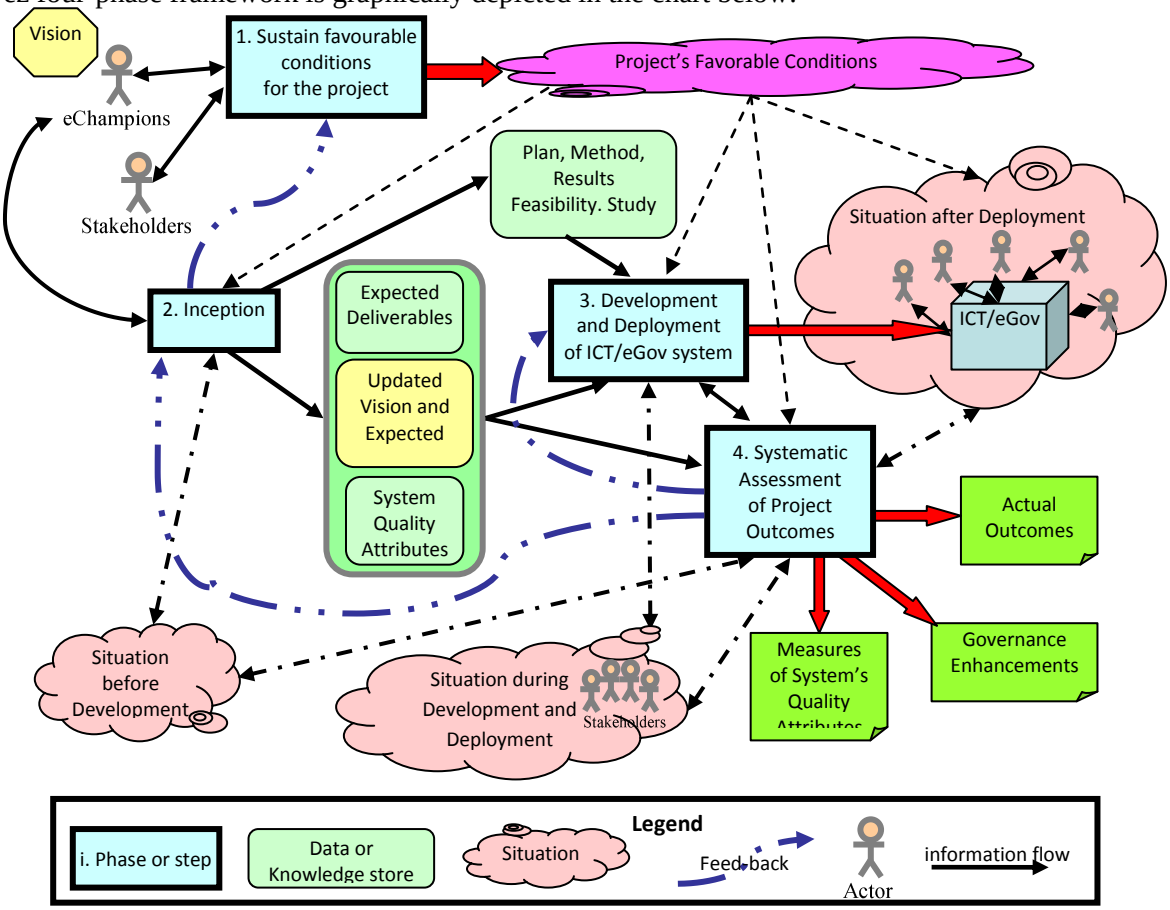


Figure 1: Overview of eFez Intervention Framework

Considering the paper's limitations on size the framework's details were difficult to include but are available through Kettani et al, 2008a and 2009b. The development of eFez action research intervention underwent four phases. These are discussed below.

a. eFez Intervention: Favourable Conditions Phase

Creating sustainable and favourable conditions for all actors in the project is a constant objective. As a major goal it influenced several stages. For instance, eFez action research opened participation of AUI, through the ICT4D Research Laboratory, to collaborate in the socio-economic environment. ICT4D also meets community-perceived needs via producing knowledge and materializing it in grounded praxis. The relations they have built and maintained with the Fez municipality has also been crucial in the project's longevity. ICT4D's collaboration with the PPP has created useful task forces named: Fez eChampions.

eFez action research also allowed open communication through the PPP. The ICT4D team at AUI opened itself up by inviting the active involvement of/ and engaging Fez partners throughout the different phases of the project life cycle. Fez local government opened itself up by providing the ICT4D team free access to its administrative units and giving instructions to the personnel to facilitate eFez implementation and to utilize eFez results (i.e. eFES platform) as they materialize (for testing, improvement, validation, and take-up purposes). The PPP succeeded as a collaborative body thanks to the mutual interest and goal in implementing the eFez project.

Gathering and maintaining favorable conditions for eFez implementation entailed opening up the ICT4D research lab (based at Ifrane) and Fez municipality to work together (regardless of the geographic distance estimated to be 60 Km). The partnership provided the needed public-private collaborative expertise towards eFez implementation. The success of eFez implementation was initially unexpected in Morocco; Unwin notes, "Public-private partnerships (PPP) are often used for complex or high-cost projects in which knowledge and expertise from both public and private sectors need to be combined," later explaining, "There are usually three main options for partners: to build a project; to build, own and operate it; or to build, operate and transfer" (2009: 305-6).

b. eFez Intervention: Inception Phase

Inception is a phase leading to designing the eFez project around its key principles. One key principle focused on steering the ICT4D-Fez collaboration towards tackling BEC performance deficiencies linked to the low municipal service coverage. This was an obvious concern to anyone familiar with Morocco's official figures on civil administration. They revealed a low density for BEC: one BEC office for 15,991 people and only one BEC employee per 2,557 people (DGCL, 2008). The low density in BEC offices is common. In fact, Fez is only fourth behind Casablanca, Rabat, and Kenitra (DGCL, 2008).

c. eFez Intervention: Implementation Phase

With the favorable conditions gathered and the collaboration vision acclaimed, eFez partners moved to the third phase: "Development and deployment of ICT/eGov system". It highlights several processes in two main periods. In order to prove e-Government concept to Fez partners for demonstration purposes, the ICT4D research team designed the prototype using proprietary technologies. The prototype demonstrated some benefits; but limitations existed in attempts to optimize benefits. For instance, BEC officers blamed the system for not allowing the digitization of certain life events in paper records. They also were incapable of saving certain digitized records to the database. Other problems involved problems with retrieving certain digitized records from the database, access restrictions to specific digitized records that had uncommon formats. Some laggard BEC officers utilized system limitations as excuses to maintain manual service delivery. Some technical difficulties were irreversible only because engineers could not address them in time.

Looking back at the development phase, it was clear that the system had little fault. Rather, the system was a product of certain decisions, practices, and technology choices made by the designers. Accordingly, understanding over its shortcomings came at the rolling out phase. At this point the resolution of the technical limitations and more consequently, the enabling capabilities needed to encapsulate the inconsistencies in BEC operations, showed areas where optimization could come about. Therefore, the rolling out phase led to a redesigning of the system and more importantly, rethinking design practices.

Reflection sessions provided insight into certain practices influencing the design-implementation of eFES platform. These included the following:

- Using proprietary technologies were incompatible with BEC rules and their related inconsistencies;
- Using proprietary technologies proved unsustainable. It needed license budget allocations, yet counties in Morocco are not financially autonomous. Problems like the maintenance of office supplies are common. More importantly, the local budgeting scheme imposed at the national level lags in areas of allotments to IT maintenance; and
- Including a number of BEC personnel in the system design was useful but not sufficient for the project. Creating a broader base of users in the system's design is essential in future projects.

The research team assessed the project and advocated a shift from exclusionary proprietary software to open software. Such a shift entailed abandoning closed technologies and adopting technology choices that allow programming flexibility. Enabling such a system proved vital for encompassing the challenges and consequences that arise from lack of standardization (e.g. numerous cases, inconsistencies, and irregularities) in Morocco's BEC business domain.

In using open technologies, the ICT4D research team used the "Beta Launch method". It is a method when a milestone application module is partially materialized at the ICT4D-lab, it was deployed for a trial period in one BEC office then launched for further trials in additional Fez BEC offices for advanced testing during real-life settings. Respectively, BEC officers in Fez were the users of eFES system application modules. They had a participatory role in improving the system functionalities and performance requirements via note-taking and reporting back to ICT4D engineers. This mechanism was vital to eFES system viability. At times, however, the mechanism was overwhelming. Therefore a new arrangement was established. BEC officers expressed their remarks and suggestions concerning technical failures to the Fez eChampions. The latter aggregate and categorize officers' input and report the modifications' inventory to the ICT4D team in Ifrane. The ICT4D engineers and Fez eChampions scheduled meeting and inventory of matters that were both urgent and sophisticated in resolving. Consequently, the ICT4D and Fez teams devoted three days a week for a year-and-a-half to resolve concerns over system design and implementation (both in Ifrane and Fez). As expected, meetings during these days also meant overtime in order to keep on schedule. Such participatory planning schedules were important to accommodate Fez officers' urgent needs and alert them of progress and deployment schedules. In this respect, eFez users were directly involved in the design-implementation phase.

The ICT4D team ideally wanted to see Fez counties' four IT technicians and officers directly editing the eFES platform as needed.Unfortunately local capacities lacked the needed ICT skills and programming competencies. Officers who were digitally illiterate in 2004 but acquired some ICT skill, developed the habit to use platform modules (as they materialize) in their daily work, noting the anomalies as they emerged and identifying improvements or new features to be implemented (based on their BEC regulatory expertise). This is a clear example of how the design-implementation and platform use overlapped.

BEC officers also had direct access to the design-implementation engineers and were encouraged to provide input to them. The atmosphere was a direct interaction between the BEC officers and ICT4D engineers. The intermediation of higher officials such as the Secretary Generals, other representatives and consultants was absent. Since the platform end users were the only experts in BEC domain, they were encouraged by Fez's higher officials and ICT4D management to make modifications so that the engineers could embed (officers') modifications/ instructions in the platform programming. In this respect the issue of 'whose knowledge to take into consideration' did not arise this time because end-users redesigned and fine-tuned application modules when necessary to better meet their needs. The motivation for such an approach was the need for materializing an ICT based platform inclusive and responsive to local circumstances.

Officers invested their time and ideas because the first implementation experience proved the value of the project and demonstrated overt improvements in officers' daily work. Therefore the platform gained acceptance and convinced BEC officers of its practicality and potential. The officers themselves were doing most of the redesign work though the engineers remained in control of the programming.

In time the eFez research team shifted its design-implementation mindset and related practices. At the start the design-implementation involved a couple of officers' representatives; and the ICT end-product was rushed and only met certain needs. The system had too many limitations that constrained officers' experience with using the system. The ICT4D team had to address these problems. In response, the research team re-thought its design-implementation practices, where end-users (BEC officers) guided and directed engineers with the necessary changes and new features for the system. End-users of the eFES platform became not only consumers of ICT artefacts but also had a participatory role in the production of the system. They became what is known as "prosumers."

Prosumer is not a new term. It was first coined in 1980 by Alvin Toffler in his book *The Third Wave.* Later Don created a deviation of this, 'prosumption,' in his book *the Digital Economy* to highlight the increasing fusion between consumption and production (1996). Tapscott and Williams devoted a chapter to discuss the new prosumption paradigm in their best seller book: *Wikinomics: How Mass Collaboration Changes Everything*. They defined prosumer as those who, "participate in the design, creation, and production of the product," and differentiated prosumption from other concepts, such as "'customer centricity', where companies decide what the basics are and customers get to modify certain elements" (125). With the later term Tapscott and Williams critique such a practice, "Just as prosumption is more than marketing disguised as customer advocacy, it goes way beyond product customization. Customization occurs when a customer gets an off-the-shelf product adjusted to his or her specification," pointing out that customization, "generally entails mixing and matching prespecified components, which significantly limits flexibility and innovation for users" (2006: 147).

However, Tapscott and Williams go beyond an iconoclast approach to deconstructing prosumption and offer their own paradigm, "prosumption is becoming one of the most powerful engines of change and innovation that the business world has ever seen. Cocreating with customers is like tapping the most uniquely qualified pool of intellectual capital ever assembled, a reservoir of talent that is as keenly and uniquely enthusiastic about creating a great product or service as you are" (147). They point out several examples; this new paradigm is already adopted by IBM, Linden Labs instigator of Second Life, Lego, Slashdot, YouTube, and Hollywood which in its "2006 cult movie *Snakes on a Plane* engaged its audience in many aspects of the film ranging from scripting to marketing" (2006: 130). In regards to eFez, these "co-creation" and "co-innovation" processes evolved naturally within its participatory action research in effort to pursue the needed locally perceived change via seizing what Tapscott and Williams call, "the opportunity to generate vibrant customer ecosystems where users help advance, implement, and even market new product features" (2006: 136). Fez partners (mainly BEC officers) found themselves

shifting away from a mere practice of consuming ICT artefacts to "prosumption" of ICT solutions, by allowing local knowledge to permeate the project.

d. eFez Intervention: Assessment Phase

The systematic assessment of project outcomes is a phase active throughout eFez implementation cycle. To facilitate planning, monitoring, and evaluation the eFez action research used an Outcome Mapping (OM) methodology as a guiding framework. Busken and Earl explicate OM in these terms; OM "is not 'technical'- it does not, for example, help design better research instruments or determine appropriate sample sizes. It does however use strategic planning and evaluative thinking to help researchers plan for and assess the influence of the research process and its findings" (174). OM follows "three broad stages: intentional design, outcome and performance monitoring, and evaluation planning. Outcome Mapping promotes participation and is most effective when it includes program staff and partners throughout all three stages" (2008: 176). OM focuses on one main result and that is "outcomes as behavioural change". OM defines outcomes as "changes in the behaviour, relationships, activities, or actions of the people, groups, and organizations with whom a program works directly" (Earl et al, 2001: 1). OM's centre of attention is on people. It focuses on those being within the project's direct sphere of influence. They are called "boundary partners" and they are defined as "individuals, groups, and organizations with whom the program interacts directly and with whom the program anticipates opportunities for influence" (Earl et al, 2001: 1). In fact "by providing planning and monitoring tools that keep an eye on both, outcome mapping links all activities and behavior changes in the program's direct partners to the broader purpose of positive social change. The metaphor of the map is fitting, because the method helps the action researcher manage the journey so as to arrive at the destination" (Busken and Earl, 2008: 178).

In the case of eFez, the research team interacted with BEC officers, Fez's four IT technicians, and Fez's six counties' decision-makers. These were the main boundary partners for eFez. With the use of OM eFez focus transcended mere ICT technical implementation, and that by investigating and tracking changes and outcomes generated with the deployment of ICT systems. The eFez project looked to gain insight on how the project produces positive changes on governance realities, peoples' lives, and community human development.

To systematically assess the project outcomes, the eFez project started with deliberations and consultations focused on identifying and defining each actor's role and related responsibilities (needed to be fulfilled towards facilitating smooth implementation and integration of eFES platform in Fez environment). Completing this assignment produced a document called *eChampions' Profiling Analysis*. Although it was a modest effort, it tackled the very difficult challenge of defining the behaviours of different actors. The document did this in order to understand eFez's progression and future direction. This assisted the team in defining "outcome challenges" for each boundary partner and "progress markers" associated with it.

Progress markers were regularly monitored via an 'outcome journal' to track and map boundary partners' behavioural changes. The underlying motivation of monitoring progress markers was the team's OM assumption: "boundary partners control change and that, as external agents, development programs only facilitate the process by providing access to new resources, ideas, or opportunities for a certain period of time." (Earl et al, 2001: 1). Thus, the eFez research team recognized how "the process of developing progress markers taps into tacit knowledge, and forces practitioners to make explicit their theories behind the interventions and their knowledge of the context and the boundary partners. Outcome mapping brings a systemic perspective to possibilities for influence, and as such invites openness about the motives for

change. It allows academic researchers and practitioners to share, on equal ground, as experts" (Busken and Earl, 2008: 183).

5. *eFez Intervention Results*

Following framework phases and different processes fostered openness in local government. The co-creation processes pursued within eFez research project contributed to reshaping the relationship between the State (Fez local government) and citizens (Fez's local community). The prosumption of eFES platform enabled Fez to transform day-to-day operations in BEC offices. Most BECs already shifted from manual service delivery to automated service delivery; as reflected in the steady equipment of front line staff with database technologies to serve citizens.

Nineteen BEC offices have abandoned manual service delivery altogether (at the time of writing this article). The innovation diffusion approach is useful to assess particular changes in a work environment. The innovation diffusion (e.g. Rogers, 1995) has been used in several IT studies within organizational settings. Its application rests on the reasoning that "information technology implementation is seen as part of an organizational diffusion process, with the focal technology as the innovation" (Scheepers and Rose, 2001). These studies developed several diffusion models, namely the Cooper and Zmud Model. It identifies six stages in IT diffusion within organizational settings: 1) Initiation (starts with either demands to resolve organizational problems or response to technological advances); 2) Adoption (is characterized with the organizational decision to acquire the IT system); 3) Adaptation (is featured with organizational readjustments to acquire and operate the new system); 4) Acceptance (involves the process of encouraging the usage of the new system); 5) Routinisation (featured with the system being widely used within the organization), and 6) Infusion (is the stage where the system usage results in attaining organizational objectives, such as improved performance and effectiveness). It appears this model was built where organizations acquired off-the-shelf systems (1990).

Based on the Cooper and Zmud Model (1990) detailed above, eFES platform has attained three maturity levels (at the time of writing). Fourteen Fez offices reached the adaptation stage (using the most updated version of eFES platform to convert paper records to digital format, a prerequisite for automated instant service delivery), nine offices already arrived at the routinisation stage (featured with the pervasive use of eFES platform for electronic issuance of certificates to serve citizens), and ten offices reached the infusion stage (highlighted with organizational results incrementing and further legitimizing the shift towards eFES-mediated eBEC model). The diagram below depicts the status of eFES ongoing scaling up:

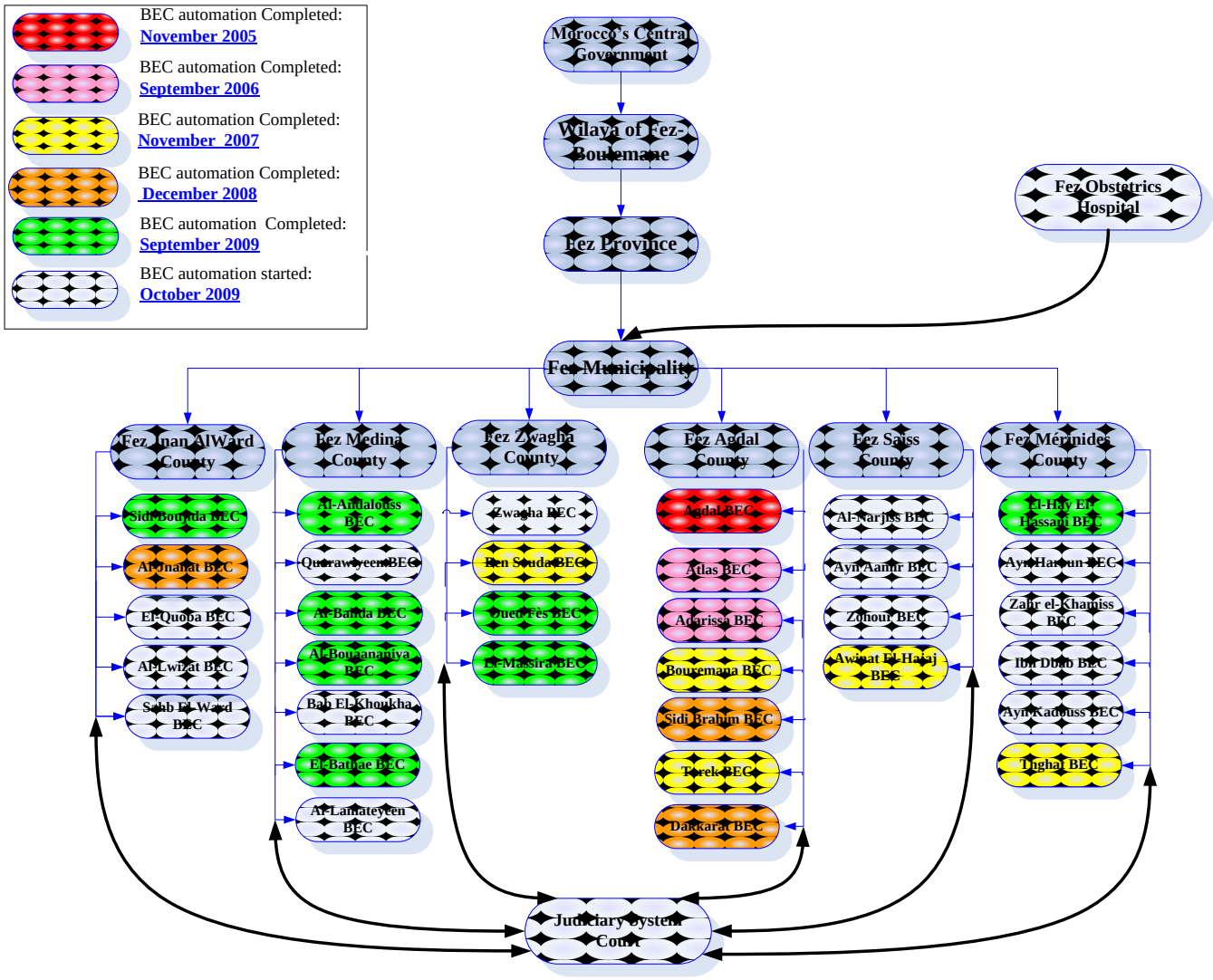


Figure 1: eFES Scaling-Up Status

There have been incidents reflecting eFES diffusion maturity levels. One incident is in Atlas's BEC. In summer 2008, there was high demand on certificate issuance and the BEC's supplies of printing ink were depleted. The employees called the Fez-Agdal Secretary General to request printing ink supply. The supply was not available at the time. Atlas employees made donations to raise the needed funds to purchase printing ink in order to avoid returning to handwriting certificates. This surprised Agdal leadership to see employees with modest salaries making donations to purchase an item for office work (Kettani and El Mahdi, 2009). Likewise in spring 2009, Bathae BEC received unusual high demand of students requesting certificates to qualify for taking a national exam. With such a high demand, the printer broke down. One Bathae officer took the printer in for immediate repair, paying for the costs of repair with his charge card. This was done to avoid reverting back to manual requests as there was likely to be delay in the shipment of a new printer. A final example is at the Fez-Jnane administrative unit where the Secretary General donated his office's computers to Jnanat BEC office to ensure the front line employees were well-equipped with eFES database. The underpinning motivations for these measures and initiatives is, one the one hand, the growing recognition eFES making service delivery effortless and, on the other

hand, citizens preferring the automated certificates more than the manually generated ones as the manual ones have legibility problems and copying errors at times.

Within eFES induced transformations, Fez government shifted away from closed practices to open practices. Fez is the pioneer in introducing self-service touch screen kiosks within its BEC offices (entrusted with citizen-oriented service delivery: certificate issuance). Self-service kiosks were first introduced to Morocco by Banks in the 1990s and recently introduced by Casablanca Airport for checking purposes (at the time this article was written). No public administration (except for Fez) has introduced such kiosks. Fez encourages its people to use interactive kiosks to have direct access to their certificates. It is done to cut out the intermediation of personnel that are in most cases bureaucratic and rare cases abusive (Kettani et al, 2008). Respectively, Fez increased the options available for citizens to receive their certificates via an integrated mix of automated kiosk/face-to-face delivery channels in effort to secure impartial and inclusive responsiveness to citizens' increasing demand.

Using eFES database technologies proved useful in alleviating Morocco's development challenge. Previously BEC access to Moroccan citizens was difficult and costly but necessary for professional and personal advancement (i.e. life events' certificates). Institutional capacity was weak due to the low density of BEC offices: one BEC/15,991 people and only one BEC employee/2,557people (DGCL, 2008). This problem coupled with the bureaucratic ills of manual service delivery was a daunting challenge. Accordingly, eFES platform succeeded in generating unprecedented efficiency gains via Fez offices serving a larger number of citizens in less time and with higher certificate issuance quality (Kettani and El Mahdi, 2009).

One noticeable effect of up-scaling eFES retooling capabilities was apparent this year during the school enrolment period, occurring between September and October 2009. This season is known in Morocco for a skyrocketing demand of BEC certificates which in the past took four to ten working days (depending on the BEC size and capabilities). Remarkably, the September-October 2009 season was unusual for Fez. All Fez automated BEC offices were capable to ensure instant service delivery which made the season more bearable for both BEC officers and citizens alike. The chart below depicts the overall usage rates of eFES platform within Fez ten BEC offices that shifted from manual service delivery to automated service delivery and have advanced to the infusion stage:

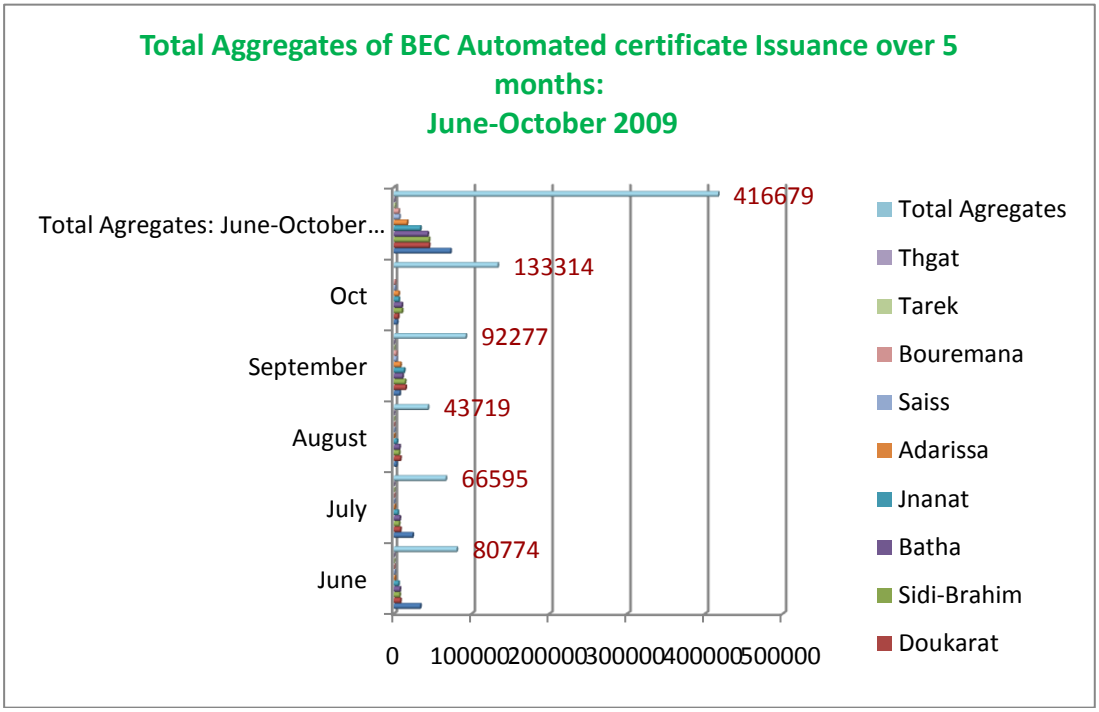


Figure 2: eFES platform overall usage rates within Fez ten BEC offices that already arrived to infusion stage

Fieldwork investigations revealed not only that the eFES platform enabled efficiency gains but also improved several ethical aspects (Kettani and El Mahdi, 2009). These changes are categorized according to the UN attributes of good governance and are outlined in the table below:

Table 1: eFez Ethical Aspects

Governance Attributes	Measured Indicator	Value before automated system deployment	Value after automated system deployment
Transparency	Visibility of workflows for citizens via automated service delivery	No Since the BEC back-office is completely manual, sub processes of making BC request, processing the request, and filling out the needed copies of BC are carried out in separated way (and sometimes with different employees). The citizen cannot monitor/ see the processing progress of his BC (e.g. the possibility of length/possible reasons for a delay in a processing are neither accessible nor visible)	Yes Since the BEC back-office is electronically enabled, sub processes of making BC request, processing the request, and printing the processed BC are merged in one process carried out on a real time basis. This secures the principle of: first-come-first-served
Effectiveness and efficiency (as a citizen user)	Efficiency: optimal use of resources for citizens to request & obtain BC	No requesting and obtaining BC is costly for citizens: - extended waiting time - several trips to BEC - need to tip (or use social connections)	Yes Citizens making time/money/effort savings in requesting and obtaining BC: - no waiting time - one trip to BEC - no tip
Effectiveness and	Efficiency and	No	None (i.e. casual calls on employee

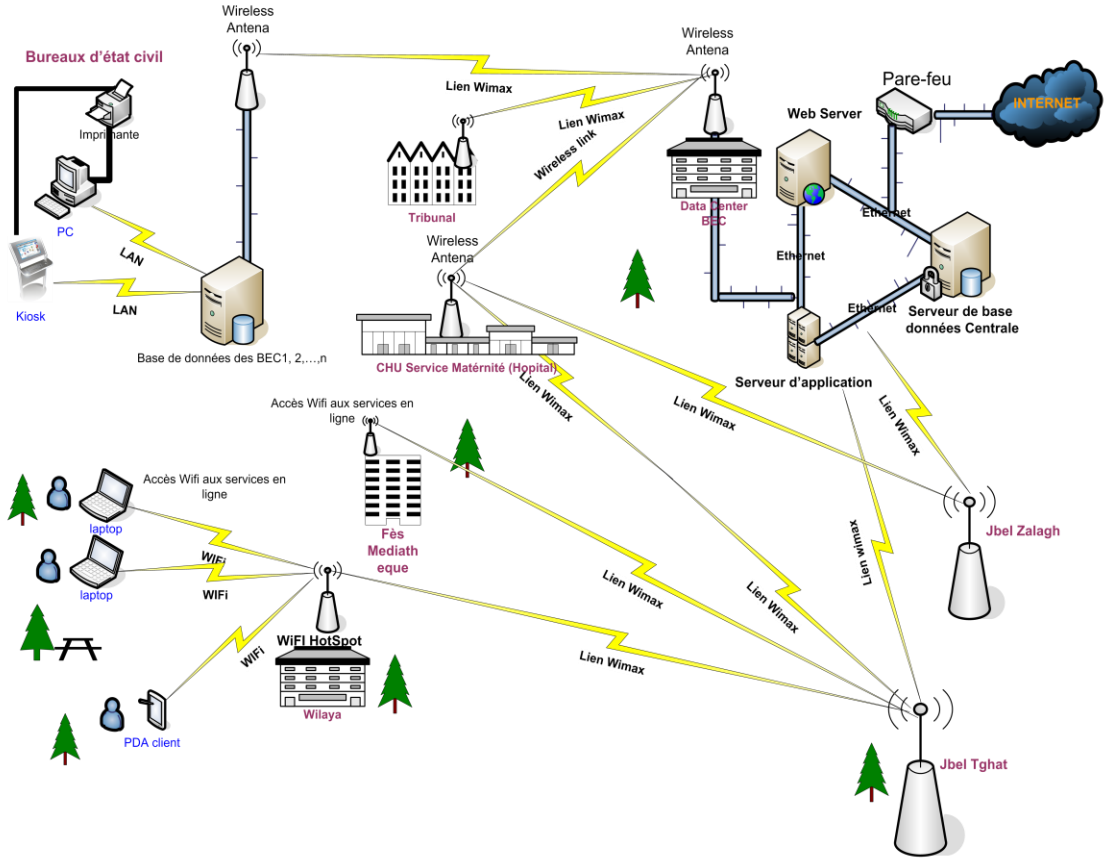
efficiency *(as tax payer)*	effectiveness of using scarce public resources	To deliver BC, BEC needed 3 full time employees (when demand on BC is low and moderate) When demand on BC is high (during summer and early Fall period: from June to Sept.): - All BEC employees (10) stop processing their respective tasks in order to process BC requests - Furthermore, they take BC requests home to be processed (which is illegal)	time with the elimination of 3 full time dedicated employees) - No BC full time employee: (any of the employee can instantly process BC requests while doing her other BEC related manual tasks) - With the kiosk: no employee is needed to process the requests
Equity	Citizens served in equitable manner	No Usually queuing/waiting creates motives and conditions for bribery incidents. Citizens find themselves obliged to tip the employee in charge in order to be served, especially when they are in a hurry to meet tight deadlines of submitting paper work	Yes ICT eliminated the need for citizen to tip in order to be served all citizens are served on a timely and in a similarly professional manner (regardless of social class)
Rule of law	Laws are applied impartially	No Equity is violated; and violations are perceived as normal: Many violations of law as people paid for special privileges (queue jumping)	Yes Eliminating value and opportunity for tipping reinforces the rule of law:
Participation/empowerment *(i.e. citizens are empowered to legally control the service delivery to their advantage)* *Process of disintermediation: elimination of middle person in service delivery*	Citizens' active participation in BEC services	No Citizens were not participating actively in the service delivery (with possible negative consequences on the service delivery arising from issues occurring in the workflow)	Yes Citizens through the kiosk/online service delivery actively participate in the service delivery, which eliminates possibilities of negative consequences arising from difficulties in the workflow
	Dependency on bureaucracy: Dependence of citizens on the employees good will	Yes Citizens were at the mercy of employees to get served	No Citizens through the kiosk/online service delivery are not at the mercy of employees
Accountability *(the process of 'routinization' of the BEC process is a process of creating standards against which the individuals can be held accountable; when the system is opaque, it is not possible to hold individuals accountable)*	Existence of standards to hold individuals accountable	No No standards because of the opaque and inconsistent system	Yes Visible/ transparent/ consistent system with implicit standards available against which to hold BEC accountable
Responsiveness	Consistency in the relationship between input and output	No The service delivery is not predictable The citizen cannot legally influence	Yes The system (i.e. automated service delivery) is by definition/design

		the system to be predictable/responsive	responsive/predictable
Consensus orientation	Not Applicable		
Strategic vision	Not Applicable		

Source: Kettani et al, 2008b

Clearly because of the eFES retooling effects, Fez gained greater frontline autonomy with respect to certificate issuance and citizens obtained greater control over processing and improved accessibility to services (i.e. certificates) through touch screen kiosk. Accordingly, Fez government adopted open processes to acquire and use eFES platform to boost its public value. This enabled easier access to certificates issued with higher quality at the convenience of its constituents.

Pleased about eFES unprecedented achievements in reshaping BEC offices in Morocco and eager to further boost its public value, the Fez government went one step further in pursuing openness. It welcomed the ICT4D team in 2008 to build a wireless metropolitan area network using Wimax technologies. This project is known as wman@fez and funded by the IDRC. It aims to interconnect Fez citizen-centric service providers (such as BEC offices, court, obstetrical hospital) so data can be accessed online and provide more web-based services. It offers free internet access in Fez's large public park for community members (Kettani and El Mahdi, 2008). The wman@fez installations were completed recently and now work is moving to co-design and co-implementation of new citizen-centric applications. Below is the architecture overview of wman@fez:



Wman@Fes: Generale Architecture

Figure 3: Wman@fez Architecture Overview

Correspondingly, Fez government has followed open processes towards 'Open Government.' Smith et al define open government. "It consists of a range of activities including information provision to various forms of participation, interaction, and collaboration," and, "it allows for a range of activities: increased information provision (including commercial, non-commercial, cultural, etc), increased information provision for accountability purposes, enhanced participatory governance and co-creation of public services" (2008: 21). Fez government pursued the initiation of open government by allowing academia to access and collaborate on projects like eFES. The engagement of officers to direct and guide eFES platform design-implementation matters satisfied all actors' interests, like the adoption of open source software and allowing community members to have direct access to their respective certificates documenting life events (i.e. BEC offices).

Nevertheless, open government at times encounters obstacles. The eFES platform encountered some incidents with back office-front office integration. With automation there are hopes to reduce bureaucracy and its ills, such as restricted access to information. Problems however can occur with bureaucracy reinventing itself in ICT. In January-March 2009 an incident occurred; officers had the possibility to modify records already validated in order to correct errors upon the request of citizens (who needed to present supporting documents); and Fez four IT technicians had access to administrator account(of eFES platform) for maintenance purposes. Nevertheless, one of these technicians convinced engineers to deny officers the possibility of correcting validated records; he mobilized the engineers to have the administrator's account supplemented with the exclusive access right allowing technicians the privilege to grant officers the possibility to modify a validated record. Therefore, with technicians' intermediation, BEC officers lost autonomy for correction matters (upon citizens' requests); and thus, Fez officers needed to make phone calls requesting administrator's intervention whenever they needed to correct a record before issuance; these phone calls proved over time to be too unaffordable for officers' low purchasing power. Regrettably, there was an increase in cases where citizens were still delayed in their certificate issuance (which consequently resulted in hotel expenses for Fez non-residents and several trips to BEC offices). Problems like these have led to reverting back to delivering handwritten certificates, which was laborious and unwelcome by many citizens. In response, officers, upset with the new bureaucratic obligation of administrator' approval, revoked the technicians' administration privileges (which proved later that they had no legal grounds).

At the national level, the eFES platform gained visibility with various media coverage. From this exposure ten cities have approached the research team to adopt open government in their municipalities. Five cities have joined eFez community of practice and two of these already arrived to the routinization stage. Additionally in 2008, the central government allocated 60 million Euros for retooling and automating Morocco's BEC offices, estimated to be 2172 in total (Rmiche, 2008). Nevertheless a commonly asked question is whether the central government will use the Fez automation product or will opt for an off-the-shelf product imported from abroad. There are concerns that the latter scenario might dispirit prospective local innovation endeavours.

Conclusion

Clearly the eFez action research team followed the four phase framework which enabled a shift towards Open Government in the city of Fez. Throughout the framework and its processes the Fez government made a shift from ICT laggard to ICT prosumer. Such a shift moved from exclusionary access to citizens database as a privilege of the IT administrator (i.e. technician); closed practices keeping citizen' life events records in paper requiring bureaucratic processing and multiple personnel intermediation to

encompassing open technologies, direct access to the database for all officers (in effort to ensure their full autonomy serving citizens), and open practices making records available online and encouraging direct access via self-service touch screen kiosks.

Pursing open government has generated various outcomes. These include but are not limited to the Fez community habitually using electronic front office delivery channels: the self service technology (i.e. touch screen kiosk), SMS, PDA, and web portal. This has gained Fez's citizenry improved accessibility to their documents. Thanks to an unprecedented instant service delivery, Fez's institutional capacity has been further reinforced (due to ICT-based tools co-implemented in action research mode and a growing digitally literacy in the workforce). Morocco's media has offered awareness of eFez's transformation effects. Policy makers at the local and central levels have taken great favour in ICT diffusion. As an example Fez's Mayor, Mr. Hamid Chabat, listed eFES platform as the first item in his 2009 election program and took pride as a pioneer in e-Government for Morocco; He was re-elected last summer. The Central government allocated 60 million Euros for retooling and automating Morocco's BEC offices (estimated to be 2172 in total) while five other cities have joined the eFES community of practice. In this respect, eFez action research has changed the face of local public administrations and promises to be an effective tool in Morocco's future development if recognition of its achievements continues.

- *eFez Awards*

eFez innovative qualities have been acknowledged and recognized via:

- Morocco's national Award: "*eMtiaz 2006*"; http://www.eforum.ma/dossier-de-presse-2006.pdf
- The African prestigious Award: the *2007 Technology in Government in Africa (TIGA 2007) Award*; http://www.uneca.org/eca_resources/news/2007/tigaawards.pdf
- The 2007 International prestigious Award of the *United Nations Public Service Awards (UNPSA 2007)* in the category "Improving the delivery of Services" http://www.unpan.org/innovmed/documents/Vienna07/28June07/summary_of_innovations.pdf
- *" The Best Scientific Paper Award in the Conference of Information and Communication Technologies"* delivered at the 5th Congress of Scientific Research Outlook & Technology Development in the Arab World (SRO5) organized by Arab Science & Technology Foundation (ASTF) in cooperation with the Ministry of National and Higher Education, Professional Training and Scientific Research between 25-30 October, 2008 in Fez, Morocco, as *part of the 1200 Anniversary of Establishment of the city of Fez, Morocco*
- Enhanced Technologies (SARL) , a social entrepreneurship initiative based at AUI incubator and created as a spinoff of IDRC-funded eFez project and led by Mrs. Houda Chakiri , was selected among top ten finalists of Dubai's Sawaed contest 2008-2009 for generating innovative ideas on using ICT to promote Arabic Content in the Arab World http://www.aui.ma/PresidentsCabinet/News/news09/news09-index.htm#sawaed

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