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Egyptian Electronic Government: The University Enrolment Case Study

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***Abstract*—**E-government projects have potential for greater efficiency and effectiveness of government operations. For this reason, many developing countries governments have invested heavily in this agenda and an increasing number of e-government projects are being implemented. However, there is a lack of clear case material, which describes the potentialities and consequence experienced by organizations trying to manage with this change. The Ministry of State for Administrative Development (MSAD) is the organization responsible for the e-Government program in Egypt since early 2004. This paper presents a case study of the process of admission to public universities and institutions in Egypt which is led by MSAD. Underlining the key benefits resulting from the initiative, explaining the strategies and the development steps used to implement it, and highlighting the main obstacles encountered and how they were overcome will help repeat the experience in other useful e-government projects.

***Keywords*—**Case studies, Egypt, Electronic government, Electronic services, University enrolment.

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I. Introduction

E-GOVERNMENT has become a global phenomenon. Developing countries have been initiating E-Government strategies and projects, as a way to promote development and reduce poverty [1]. These projects can strengthen the performance of government and public administration; and for economic and social development as well. E-Government projects can contribute to solving administrative problems in developing countries whose public administration is characterized by inefficiency, limited capacity, and poorly-trained personnel. Electronic or "online" channels can facilitate government communication functions more rapidly, efficiently and cheaply than offline channels [2, 3] .

Yet, given the e-government requirements of very complex socio-technical system, highly dependent upon overall institutional maturity, regulatory/policy frameworks, and socio-cultural considerations, the level of e-government implementation is lower than planned or expected in the developing countries [4]. The gap between developed and developing countries in Internet technological infrastructures, practices, and usage has been wider rather than narrower over recent years. Besides the lack of sufficient capital to build up an expensive national information infrastructure (NII) on which electronic service is based, developing countries also lack the sufficient knowledge and skill to develop suitable and effective strategies for establishing and promoting electronic government [5].

The structure of this paper is as follows. First, a background of the e-government in Egypt as one of the developing countries is given, as well as a background of the university enrolment as one of the crucial e-government projects in Egypt. Second, the situation of university enrolment before the project implementation is described. Third, a description of the key benefits resulting from the project will follow. Then, a description is given of how the project was implemented by identifying the strategies used, the key development and implementation steps, the main obstacles encountered and how they were overcome. Finally, the paper is concluded with the impact of the project and the lessons learned

II. E-government Program In Egypt

Egypt has taken an e-Government initiative since the introduction of the Ministry of Communication and Information Technology (MCIT) in 1999, as part of its plan to turn Egypt into an information-based society [6]. Egypt's commitment to utilizing technology for the purpose of economic and social progress was further realized when the Egyptian government announced an effective e- Government program that integrates CIT technologies to deliver government services at citizens' convenience [7]. The e-Government program officially started in July 2001 by (MCIT).

Current Minister of MSAD has acted as the program director back then. In 2004, E-government program director appointed as the new Minister of MSAD. As a result, the e-government development program has become the responsibility of MSAD. The MSAD perceives Information and Communication Technologies (ICT) as a strategic tool that could be used in implementing the National Development Program, which seeks to raise the efficiency of the state's administrative body, and delivering governmental services to citizens at a fast pace in an environment that is highly effective and effective through various interactive service channels at their convenience. Therefore, the ministry develops and implements a number of projects that achieve

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this vision through a system of integrated management for the modernization of the Egyptian Government.

The vision of e-Government initiative in Egypt is "delivering high quality government services to the public in the format that suits them". Such mission relies mainly on three principles that include: 1) citizen centric service delivery; 2) community participation; and 3) efficient allocation of government resources [8]. With the new cabinet announced in Egypt in July 2004, a confirmation and commitment of Egypt to capitalize on the evolution of ICT for the purpose of government services and processes improvements were re-enhanced [9]. The official inauguration of the Egyptian e-Government portal (www.egypt.gov.eg) took place in 25 January 2004 and was attended by Bill Gates during his first visit to Egypt, as Microsoft was chosen to be in charge of the project's implementation. Some services were placed in the portal to pilot test the project such as telephone e-billing, birth certificate issuing, etc [10].

Egypt's e-Government program has identified a number of objectives to realize a successful implementation of e-Government and that includes (but not limited to): 1) tailoring government services to meet citizens expectations; 2) creating a conducive environment to investors (local and international); 3) availing accurate and updated government information; 4) increasing government efficiency through modern management techniques and new working models; 5) reducing government expenditure; and 6) fostering local competitiveness and increasing globalization readiness [8].

The implementation of e-government is hindered with several challenges. Accordingly, several projects were created in the program each directed towards a category of problems. The university enrolment project is led by MSAD and owned by the University Enrollment Co-ordination Office (part of the Ministry of Higher Education). It is one of the projects created to increase efficiency and provide high-quality service delivery to citizens. Data for this case study is collected by conducting 6 semi-structured interviews with key senior officials involved in the e-service development process in the Egyptian government, especially those involved in the university enrolment project. Those stakeholders are: Government Services Development Program director (MSAD), Head of Policies and Program Sector (MSAD), Gateway team leader (University Enrollment Project), General project manager (University Enrollment project), Advisor of strategic projects (MSAD), and e-government program coordinator (MSAD). Also, some data has been acquired from some official documents obtained from MSAD, MICT, and The university enrolment coordination office.

III. The Problem

Admission to public universities and institutions in Egypt operates through a centralized office, University Enrollment Co-ordination Office (UFC). This office enrolls over 450,000 students into these universities and institutions each year. The public service tackled here is the application process for desired universities/institutes. Application takes place after students receive their secondary school certificates' scores (either from Egypt or abroad), on which admission precedence depends (with students having the highest scores getting first choice on the universities they will be joining). This application process took place in 19 offices distributed all over Egypt in order to try to serve students in their regions as much as possible.

In general, it can be concluded that this process is further complicated by the ever-increasing number of students eligible to join universities each year, as well as the unequal demand for given faculties in universities. The general manager of the university enrolment project justifies this issue, as he explains:

"All eligible students were divided into three groups, according to their secondary school certificates' results. Each year, following the announcement of the Egyptian General Secondary Certificate results, the date of acceptance of admission applications for each group was announced. Both students and their parents flooded the university enrollment offices, stood in long lines waiting for their turn to buy the paper application forms (costing EGP 40 per application-about € 6). Students are asked to fill the admissions application by listing their choices of their desired discipline and university in a descending order of preference. The forms were filled manually by posting a stamp for each choice; the total number of choices that each student had to fill is 48. The applications are then submitted back to the university enrollment offices. Therefore, students and/or their parents need to visit the university enrollment office at least twice to apply for university enrollment."

Also, once the office receives the student form there is no way to change its contents even if the form includes mistakes which reduces the student's chance to have a suitable position in the university. Students were not able to access their personal information before the university enrollment results were out, and mistakes would be transferred to universities and students were usually not able to correct them before graduation.

All student applications ultimately end up at a center in which all data from each and every student application form is entered by *seasonal* data entry personnel (making room for many data entry errors, affecting the institute the students ends up in), into the back-end legacy system where the matching process is carried out. Once the enrollment phase results were declared, students are notified of their results by mail. Each student has to join his/her university (no matter where it is located) for at least one year before applying to transfer to another one (and that is only if he/she receives high scores). Throughout this period, students need suitable accommodation away from their families which burdens them with extra expenses, and burdens the government with expenses for hostel establishment and operation costs/responsibility as well as means of transportation. Furthermore, the whole process of university enrollment had to be carried out within a limited time frame between the time

of declaring the results and scores and before the academic year started. A mature solution was required to serve students in a better way, reduce costs, and solve all reported problems.

IV. Key Benefits

The project initiative is replacing the paper process by a comprehensive web-based application that accepts student university enrolment applications, and is supported by a 24/7 call centre for student support. Hence, availing the enrolment application service virtually anywhere internet is available. Students were able to access the application with their student IDs and a special PIN code that they received along with their secondary school certificates. This would be of great importance as one of the officials affirms that the online application resulted in huge savings for both the government and the public. For example, he mentioned:

"The online application was offered entirely free of charge, against the EGP 40 students paid for the paper application and manuals. Given that over 450,000 students applied for university enrolment annually, this alone resulted in savings of over EGP 18,000,000 (€2,500,000) for the public. The application also provides the students with guide lines, rules and interactive online help. These guidelines are built in the application form itself, and it prevents the student from including any choice that contradicts with the enrolment rules and regulations (which was not the case before). This means that only error-free forms are submitted. The application also allows the student to check his personal information before he submits his choices. This helps in minimizing future errors."

Another benefit of the online application is that students now have the chance to alter their choices after submitting them, as long as it is in the timeframe for the phase he/she is in. Students did not have that option previously. Once they submitted their applications, there was no going back.

The transition to the online application was supported by exponentially expanding the e-Government call centre hotline, to help students with the online application. It plays an important role in connecting students, decision makers and service providers. It is also used as a tool that communicates citizen reactions to the service, which has been enormously successful. Yet another benefit of the web-based application is that students no longer have to wait for their university enrolment result to arrive by mail; they can access it directly from the very same application they used to submit their forms the very second the results are declared. Also, they receive text messages on mobile phone numbers (that they can opt to register) with the result as well.

Recent estimates have placed savings by the online process at EGP 40,000,000 (€6,000,000) in transportation, accommodation, as well as operational costs for the government. These estimates did not include further savings in paper forms, and seasonal staffing of university enrolment offices and data entry personnel.

V. Implementation

A. Strategies Used

Initiative's main objectives were to reduce costs for both the public (students/parents) and the government (paperwork, staffing, etc…), offer the service through a more convenient channel (students would not have to travel to UEC offices anymore), and separate service provider from the public. That is in addition to introducing a workflow and data analysis techniques to enhance service performance, produce a flexible system design which makes it suitable for future consolidation and aggregation, as well as utilizing the use of available resources and upgrading the infrastructure to satisfy the citizen requirements to enjoy an easy, interactive, nonstop service. Its final objective was to provide a continuous auditing system supported by the government's CRM and the service reporting systems.

Among the strategies employed in this initiative was opting not to go for a big-bang approach, and sticking to a ramp-up strategy. The initiative was first introduced in 2004 and attracted a mere 3,500 students, which reached 21,000 students in 2006. In those years it ran in parallel to the paper system. Students had the choice to register through UEC offices or online. After having 3 consecutive years with no major issues (not a single error in data, processing or performance) in the system, it was clear that it was ready for full-launch. In 2007, it UEC offices no longer offered university enrollment application services. Students had to go online to register their choices.

Another strategy was that of contingency: a disaster recovery site was set up for the web-based application, should anything go wrong, as it would become a high-value target with more than 450,000 users. Internet connections to the application were secured from 4 different service providers and different central offices as well. Severe security measures were also taken.

The final strategy was that of a certain level of performance that the e-Government Portal abided to: all of the Portal's hardware was upgraded and it was able to support more than 1,000 concurrent users.

B. Implementation Steps

MSAD investigated the universities enrolment application work flow, on its quest to identify public services that can be introduced through its e-Government initiative. This work flow was analyzed and optimized in the next few years. MSAD secured approval from the Ministry of Higher Education in 2003 to introduce the web-based application channel to apply for university enrolment. The first edition of the application was developed by the Faculty of Engineering at Cairo University in 2003/2004 to make the 2004 university enrolment season. It was launched on the e-Government Portal in 2004. It ran in parallel to the paper application starting 2004 and ending 2006. Decision was taken in late 2006 to abandon the paper application at UEC offices and to go for the web-based application *only* for the 2007 season of

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university enrolment.

High measures were taken in anticipation of the huge number of users for the system in 2007. More than 600 computer labs all over Egypt were made available to eligible students to use for university enrolment application for free. Well-trained specialists were available in each lab for nine hours a day to assist students/parents in filling the applications, through all 3 university enrolment phases. 19GOV call centre was operating around the clock as well to support students/parents. Training sessions are held annually for CRM (call centre/e-mail/fax) agents and support team, as well as lab specialists, in MSAD. Log files from 2007 were analyzed after all 3 phases were completed and not a single application error was found. In 2008, an updated version of the application was launched. This one supported all secondary school certificates (both local and international) – international students had to submit their applications through UEC offices in 2007.

C. Obstacles

One of the main obstacles faced was the resistance to change from the Ministry of Higher Education's civil servants that worked at UEC offices. But once the employees recognized how valuable automation can be for them, they became supportive rather than being resistive. They were also persuades to promote change by providing different incentives and preparing employees to become good users and good change agents. Awareness sessions and workshops were held along with the required training to the different managerial levels (to guarantee their support) and employees (for support and implementation). PIN codes were delivered to students by mail in the web-based application's early years. This lead to a many PINs being lost/undelivered with students not being able to access the application (only 35% were actually delivered with some even opened). Starting 2007, the Ministry of State for Administrative Development succeeded in persuading the Ministry of Education to attach the student PIN codes to their success certificates which was a key success factor for the project.

Problems related to infrastructure limitations were faced when project started in 2004. This resulted in some deficiency in the service while availing different phases' results when huge number of students and their families try to access the application in a very limited period of time (more than 120.000 users in less than three hours). In 2007, university enrolment results were sent to students in SMS's at the same time with deploying it on the service server and providing the same data through the main internet service providers (ISP's) in Egypt at the same time which solved this problem completely.

VI. Conclusions and Lessons Learned

This case study shed some light on Egypt as a model for successful development as well as the implementation of e-government as a developing country. The paper also seeks to fill a void in the study of e-government in less developed countries, most of which are trying to catch up with the developed countries in electronic government development. Furthermore, this project paved the road for further inter-government projects that require electronic interaction between different government organizations. This will ultimately enhance government performance and develop a unified and standardized system as such systems help in consolidation, integration and aggregation of data.

The project systems reliability, convenience and efficiency are its foremost success factors, without which it would have surely failed. It was due to these high-level factors that it was very well received by the public. Another important success factor for the project is the effective project management by MSAD which coordinated between different stakeholders in the project.

The project's impact cannot be neglected. The public in Egypt are now much more open to more e-Government services (compared to how they before). University enrolment was an excellent choice of a service to undertake to build trust in the initiative. The university enrolment application project is the result of the fruitful co-operation between government organizations: MSAD, Ministry of Education, Ministry of Higher Education, and MCIT. This promotes cooperative and integrated work among them or groups of them in the future. The relevance of data collected and generated in the university enrolment service opens a door for a lot of electronic services for universities, students, and decision makers. Such services include hostels enrolment, students' transportation support, university student affairs, and many others which would help decision makers plan and utilize the available resources better.

The project's success and the Egyptian e-Government Portal enabled covering more specializations such as general certificates and doctors charging service (which is executed 11 times annually) which eliminates the need for external interfaces, multi-systems and applications previously deployed. The same module can be used to deliver more services with very little changes and minor investment.

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