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journal homepage: www.elsevier.com/locate/govinfRisk factors in e-justice information systems[☆]João Rosa, Cláudio Teixeira^{*}, Joaquim Sousa Pinto

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ABSTRACT

With the increase of the communication systems' bandwidth and with the dissemination of the information systems, the fields of information and communication technology application expanded in almost all directions. E-government in general and e-justice in particular are no exception and these areas suffered strong changes in the last decades. There is no democracy without a system of swift and transparent justice. Therefore, the introduction of information systems in the courts allows a decrease both in time and number of pending processes, boosting the efficiency of the services provided to citizens and to the society in general.

This paper analyzes and discusses different worldwide e-justice experiences. Special emphasis is addressed on the risk factors on the design, development and implementation of such systems. Finally, we present our own experience in the development of an e-justice information system in Cape Verde, an African development country. The scope of our system ranges from the design team until the training of the justice agents.

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1. Introduction

In the last decade e-government systems became a central concern in the countries' policies. E-government is defined by OECD as "the use of information and communication technologies, and particularly the Internet, as a tool to achieve better government" (OECD, 2003). These information systems provide a tool to organizations and people to computerize procedures and everyday tasks, combining technology, organization know-how and people experience.

E-government states that it can improve efficiency, decrease budget and increase trust between society and governments. With these major goals, governments can reform public services, improve quality and try to reduce corruption.

The separation amongst the executive, legislative and judicial powers is the keystone in democratic countries. Citizens hope to have a fair, efficient and transparent justice system. To help reaching for better justice, e-justice information systems are designed to handle lawsuit related information, mimicking and possibly improving traditional paper based workflows, thus providing a useful tool to involved agents.

According to the 2011 Economist Intelligence Unit report (Economist Intelligence Unit, 2011), Cape Verde is the first African country in the Democracy Index (ranked 26th), leading over countries like Portugal (ranked 27th), France (ranked 29th) or Brazil (ranked 45th) and just

behind Spain (ranked 25th). Over the last decades they have improved their democratic structures, developing democracy, and their efforts are recognized by the international community.

Cape Verde is an archipelago of 9 islands located in the Atlantic Ocean with a combined area of over 4000 km². According to the 2010 census, the country has 491,875 inhabitants, 50.5% female and 49.5% male (Instituto Nacional de Estatística de Cabo Verde, 2011). The population increased 11.6% compared to the 2000 census.

In terms of justice, in 2008, 8415 court cases were filed and in 2009 there was a decrease of 5.56% on filed cases, totaling 7972 new cases (Conselho Superior da Magistratura Judicial, 2010). In terms of cases reaching a decision, there were 7762 in 2008, and 6996 in 2009, signaling a decrease of 10.95% on decided cases. When comparing filed vs. decided cases (pendency), there is a drag of 8% cases in 2008 and 12% cases in 2009, totaling about 10% of dragged cases in just 2 years. At this rate, the courts will be more and more clogged and justice will be served more and more slowly. The informatics tools presented in the justice system were virtually nil with only productivity tools installed and used in the clerk's computers at the courthouses. This makes the procedure slow and time consuming, because there is no standard procedure through the justice system and the assignment of human resources is not efficient.

Therefore, in 2008 the Cape Verdean Ministry of Justice started the planning for the development of an information system, named SIPP (*Sistema de Informação do Processo Penal/Criminal Proceedings Information System*), to be used in the courts of law. SIPP is a joint initiative, sponsored by the Ministry of Justice of Cape Verde, the Superior Council of Magistracy and the Superior Council of Prosecutors and would be developed from scratch by the University of Aveiro and University of Cape Verde. The SIPP has been in testing phase since June 2010 and will be put in production during 2012. This paper

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assesses the risk factors of developing such system, based on previous experiences and on our own experience.

This paper is organized as follows: this section introduces the problem addressed in this paper; Section 2 details on previous experiences worldwide regarding the adoption of electronic systems to court cases; Section 3 compares the cases studies presented and draws conclusions from these experiences; Section 4 presents the information systems and tools used for modeling e-government systems; Section 5 presents the Cape Verdean experience; Section 6 presents the risk factors involved in e-justice systems; and finally, Section 7 presents the conclusions and future work.

2. Case studies

In this section we present what we assessed as relevant case studies in e-justice systems. The process of analysis and comparison of the case studies is based on the methodology defined by Velicogna et al. (Velicogna, Errera, & Derlange, 2011; Velicogna, 2007). According with the authors, their methodology is the most effective to study the innovative character of ICT (Information and Communication Technology) in the broad area of Justice. In the aforementioned methodology, authors make a comparative analysis of the case studies within different categories (Technology, Organization, and Complexity). Similar to this approach, Fabri (2007) uses his own topic characterization to evaluate the case studies.

Despite being based on the Velicogna's approach, our analysis includes broader geographical, social, economic, and political information of the countries analyzed. This broader overview helps to contextualize the problems that each country tried to address at a given time. Within every case studied, we describe the Justice scenario from the first computerization attempts to the currently solutions (if any). As important as the system-per-system comparison, we bring a development perspective of each of the analyzed countries. Also, when information about the overall system infrastructure is available (from state of the art, local legislation and regulations, social communication, etc.), we include it on the evolution overview. Finally, considering that even the best computer systems require users to interact with, if available, we include the user's feedback, the development support groups' feedback and usage information about the analyzed systems.

This approach presents readers an overview in terms of evolution of each country's Justice ICT efforts, and offers an evolution comparison (Justice wide), rather than a comparison over specific systems. The evolution and outcome of each country's Justice System offer invaluable lessons in terms of what to do, what to expect, and what not to do when starting a new project or an evolution of a project within the Justice System.

The criteria to choose the relevant case studies were: (1) their innovative character; (2) the quality of available information (both technical and non-technical) about those systems; (3) the different social contexts and culture mindsets in which such systems were deployed; and (4) failed and successful examples.

2.1. Singapore

2.1.1. The Justice system prior to ICT attempts

Singapore was the first country to design and implement an information system for the justice system.

Back in 1991, Singapore's justice system faced the backlog problem, where a case took too long to produce a decision, and unsolved processes started to increase (Magnus, 1999). When the authorities diagnosed the justice system, they tried to find the causes for this problem and created a plan to decrease the time it took to produce a decision. This was accomplished by adopting solutions like night courts and cultural changes in methods and approaches when working in a case (Subordinate Courts). In 1993 the backlog problem was

solved and the justice authorities wanted to increase the courts' performance, continuing with the new reforms.

2.1.2. ICT evolution

To execute the new reforms, the justice authorities used the knowledge network created with their worldwide peers, facing the same problems, and adopted good practices, know-how and technology to create the first e-justice information system. This information system is based on multimedia kiosks, named ATOMS (Automated Traffic Offence Management System) (Magnus, 1999). With these multimedia kiosks they exposed some court services to citizens, like the payment of fines and the ability to plead guilty of offenses by the citizens, 24 h a day, 7 days a week, through this system.

This is a centralized system, where all multimedia kiosks are linked to ATOMS database, which manages the offender's information (Fig. 1). This system was the pioneer in the e-justice systems, enabling citizens to pay their fines, or consulting cases in other locations, without addressing to the court.

In 1996 Singapore authorities took a new approach in application development and infrastructure management. Until then, the application development and infrastructure management were ensured by IT (Information Technology) professionals linked to the public authorities. This approach led to a budget escalation. In 1996 however, the authorities decided to outsource both application development and infrastructure management, releasing resources to apply in other projects, other areas or new reforms. This approach was expected to reduce the overall budget, while boosting the country's economic growth. In 1999 web-based applications began replacing desktop applications. Not only had the application's interactivity changed, but also the standard web-based access to information enabled data and documents exchange between justice entities. This helped on improving efficiency, transparency and decreasing the time consumed, because it changed the way of addressing the Court. This second generation of information systems uses a typical 3-tier layer (Fig. 2) using Oracle databases, FileNet workflow systems and Powerbuilder or Oracle client software. To standardize electronic documents interchange, they have elected PDF (Portable Document Format).

After this shift, one of the new web-based information systems, designed and developed to replace the legacy systems, was the EFS

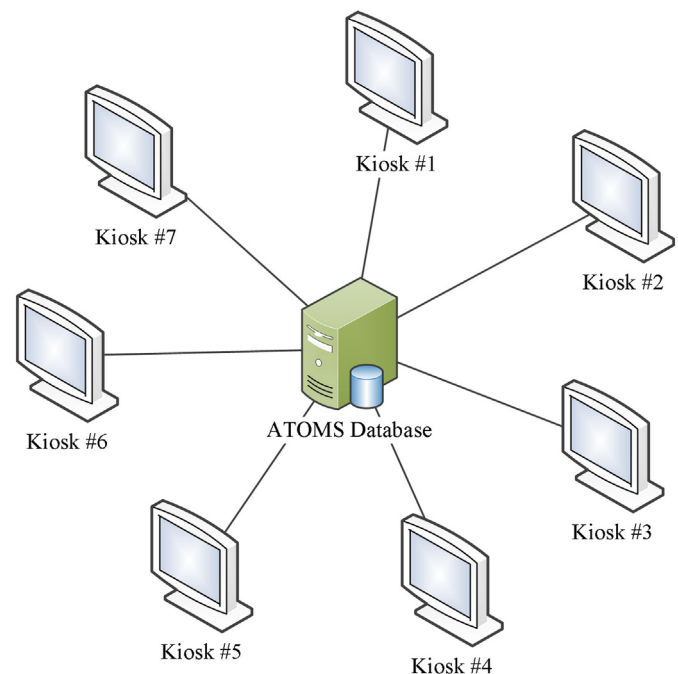


Fig. 1. ATOMS architecture.

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