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CASE STUDY

Establishing a National ID Programme in the UAE

INSEAD INNOVATION & POLICY INITIATIVE

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Background

Rapid advancements in information and communication technologies (ICT) have resulted in a paradigm shift in the way governments across the globe conduct business. ICT systems have become central to government operations and the delivery of services. Governments have been forced to rethink their business processes and determine how they can best exploit new technologies to maximize their value-add by providing faster, easier to access and lower cost ways to transact with government agencies. Developments in, now commonly known, e-government services are paving the way for more efficient sharing of information and a higher level of cooperation across government at the local, national and international levels. At the nexus between these potential offerings sits the idea of a smart national ID card.

Over the last decade, as part of national identity management (IdM) programmes, many governments have implemented electronic identification (eID) systems as a technology platform for the administration of service delivery by government. National eID systems provide users with a national registration number that can be used as a common identifier by government agencies. Central to eID systems has been the issuance of smart national eID cards as a means of personal identification. Frequently the most visible component of national IdM programmes, eID cards have often been the most contentious aspect in many countries. Some countries have made it mandatory for their citizens to have an ID card (e.g. Belgium, Italy and Spain), while other remain optional (e.g. Austria, Japan and Sweden). There is also considerable variation between countries in terms of the type, function and nature of data stored on ID cards, as well as in the integrity of the systems supporting them (Prasad 2006; Statewatch).

Many countries have introduced national eID cards as part of the eID systems; this includes, but is not limited to, Argentina, Brazil, China, India, Malaysia, Singapore, South Africa, South Korea, and most countries in the European Union. Counter to this trend, the UK scrapped its national ID cards and national identity register in 2011 after a change in government. Other countries such as Australia, New Zealand and the US have decided not to introduce national ID cards in the near term due to popular backlash. Resistance to the introduction of ID cards has stemmed from concerns over, inter alia, costs, privacy rights and data security, infringements of civil liberties, and doubts over their effectiveness as a tool to tackle crime and terrorism (Johnston 2013; Mukhija & Goyal 2005; Ouziel 2009; Travis 2010; Wadwa 2013).

In healthcare, a number of countries have linked their national eID systems with health care services; examples include Austria, Belgium, Estonia, Malaysia and Portugal (Castro 2011). This not only facilitates accurate patient identification, but also provides a platform for healthcare-providers, insurers and regulatory bodies to access patients' medical records, insurance coverage, medications/prescriptions, and emergency information. However, the extent of health care data available through eID systems varies between countries. Among other things, unique patient

identifiers (UPI) embedded in eIDs can be used to 'red-flag' contraindications[1] where medical procedures, surgery or a combination of drugs might result in negative health outcomes. Notwithstanding, in countries such as the UK and US, concerns regarding medical privacy and the security of medical information, as well as the cost of implementation, have hindered the introduction of national electronic databases (Brase 2012; Carvel 2005).

In the business sector too, banks and retailers among others, have begun introducing their own distinct smart cards. Sweden provides an interesting example of where the government has actively encouraged the issue of private sector eIDs in addition to the government-issued eID card. Moreover, users are given the option of obtaining an eID on a card, mobile device, or on a file that can be downloaded onto a PC (Castro 2011). Other countries with private sector issued eID cards include Denmark, Estonia and Norway.

In the UAE, government at the Federal level has over the last few years introduced a national ID card and eID system for both citizens and residents. This has emerged as a response to the opportunities and challenges resulting from the rapidly expanding role of government, a concomitant and pervasive diffusion of ICT in government services, and the continued influx of foreign labour and visitors to the country. To reflect the significance of the latter, between 2005 and 2010, the population of total residents in the UAE doubled.[2]

The Genesis of the UAE ID Card

In 2003, recognising the opportunities provided by technological advancements and the importance of improving mechanisms for identity verification, the UAE Federal government embarked on a journey to establish a state-of-the-art national IdM programme, with two strategic goals addressing national security and economic requirements (Al-Khouri 2007). These were to:

1. Support national security through the creation of a modern national IdM infrastructure, built around a centralised and integrated national population register. Amongst other things, it was hoped the national IdM programme would help to combat terrorism, prevent identity and benefit fraud, and better control immigration.
2. Provide a secure and trusted identity verification system to improve the coordination of, access to, and delivery of government services to the population, thereby facilitating better resource allocation and more efficient and effective ID-based service delivery.

This initiative coincided with the introduction of similar electronic IdM programmes around the globe, including in European countries such as Austria, Denmark, Italy and Sweden, and further afield in nations such as Hong Kong, Malaysia and Thailand.

The Federal government established the Emirates Identity Authority (Emirates ID Authority) in 2004 to develop and manage the implementation of the national IdM programme. It was hoped that a national IdM system providing a platform for electronic identity verification would enable trusted remote interactions between government, businesses and individuals. In addition to meeting national security objectives, the IdM programme was also seen as critical to the development of the digital economy. Moreover, the centralized and integrated population register would support planning and resource allocation decision-making across government.

[1] Source: http://www.nlm.nih.gov/medlineplus/ency/article/002314.htm
[2] Source: http://www.uaestatistics.gov.ae/ReportPDF/Population%20Estimates%202006%20-%202010.pdf

Importantly, the UAE's Electronic Transactions & Commerce Law No.2/2002 provided a legal framework to ensure electronic IDs could create legally-binding signatures (Daudpota 2010). And while the UAE does not have any specific data protection laws, the Constitution and a number of provisions in several different laws that relate to data protection and privacy, underpin the principle of a right to privacy regarding personal information in the UAE (Garrod & Smith 2011). In addition to this, the Emirates ID Authority indicates that it is preparing a framework that will mandate the use of digital signatures for legal and commercial transactions. The draft framework will be submitted to the UAE Ministry of Justice, and is drawing on standards and frameworks currently in use in Europe.

In 2007, H.E. Dr Ali Al-Khouri, then Assistant Director General of the Emirates ID Authority, explained that the development of a national population register would enhance the performance and efficiency of government through the provision of "timely, accurate, and statistical information for strategic decision-making and long-term planning with respect to education, healthcare, town planning, transport requirements, energy, etc." Further to this, Al-Khouri indicated that the IdM programme was designed "to unify the existing cards in the country such as driving license(s), labour card(s), health card(s), and other 'entitlement' cards". He predicted that this unification of cards would have "a profound impact on the economies of scale in the management and production costs of such cards" (Al-Khouri 2007).

Thus, while the genesis of the idea resided in a security concern, a strong technology push gave a new impetus for the eID concept where government security concerns and citizens' utility gains were becoming possible to wed together in a single eID card.

National Strategies & Policies for IdM Programmes

It is estimated that more than 130 countries have introduced national IdM programmes, while others are considering implementing such programmes (Al-Khouri 2011). In 2011, the OECD published two reports presenting the findings of an international study of digital IdM systems across 18 countries. The reports provide policy makers with guidance in developing strategies for the management of electronic identity data with the stated goal of supporting innovation across the public and private sectors while enhancing security, privacy and trust online. The study analysed the overarching visions and strategies for the development of national IdM strategies and determined (OECD 2011):

> Vision: the main objectives for national IdM strategies are to realize e-government, to foster innovation in public and private e-services and to strengthen cyber-security.
>
> Strategy: the primary focus of national IdM strategies is public administration with expected spillovers in the private sector.

In line with the findings of the OECD studies, a wider review of literature analyzing national IdM programmes indicated that the overarching goal of these programmes is the development of a centralized platform for the storage and management of digital data for identity verification purposes to meet *national security* objectives and facilitate *greater efficiency in the delivery of government services*, including the promotion of e-government and the digital economy. Governments around the world also appear to face similar challenges in the development and implementation of national IdM programmes. (Arora 2008; Bowe 2012; Canadian Bar Association 2003; Capgemini et al. 2010; Castro 2011; Datacard Group; EFF; Engfield 2006; Gerdeman 2012;

Johnston 2013; Lyon 2009; Mukhija & Goyal 2005; Ouziel 2009; Prasad 2006; Spagnoletti & Freh; Travis 2010; Wadha 2013; Whitley & Hosein 2010).

A common feature of all national IdM systems is the requirement to establish population registers. While these were already well established in some countries, for example in Austria, Germany and the Nordic countries, other countries, including the UAE, did not have previously established population registers. Many countries also did not introduce national ID cards until recently. These cards offer security features, including smart chips for the storage of data and digital signatures. Most cards store the holder's name, gender and date of birth, while many also include biometric data such as finger prints and photographs for facial recognition.

National IdM programmes that facilitate the provision of government services and entitlements through eID systems require that governments develop a capacity to deal with massive amounts of data from multiple sources. Hewlett-Packard (2012) projected that the world's "digital universe" would grow by close to 50 percent in 2012 to 2.7 Zetabytes (ZB) (1ZB = 1 billion terabytes), and to 8 ZB by 2015. Moreover, much of these data are unstructured and hence difficult to understand and analyze. The idea of tapping into sources of 'Big Data' has gained momentum more recently and provided eIDs projects with increased significance and relevance to governments and the ways they operate and do business. IT companies such as Hewlett-Packard, IBM and SAS are providing Big Data platforms that enable government agencies to leverage vast amounts of real-time data from many sources. This in turn enables government agencies to more effectively capture, analyse, disseminate and respond to real-time data, thereby facilitating faster and improved decision-making and response times. This is of particular importance for national security and crime prevention, and in a more general sense can be used to drive improvements in the efficiency and effectiveness of government (IBM 2013). This has created new avenues for public-private partnerships and collaboration, but at the same time raised new concerns regarding privacy issues.

Beyond the challenge of Big Data, the literature review revealed that governments have encountered a range of challenges in the development and implementation of eID systems, the most common including difficulties associated with implementing effective registration or enrolment processes, interoperability, security and privacy issues. The cost of infrastructure requirements needed to facilitate the uptake and diffusion of ID verification technologies, as well as logistics, production costs and security features associated with smart ID cards also present challenges. Key issues are discussed below.

Enrolment Processes & Issuance of eID Cards

In establishing national IdM programmes based on eID systems it is necessary that citizens register their identity and that their identity attributes be checked in order to provide an individual with a set of credentials. These credentials can then be used during transactions with government and non-government organisations to access services and entitlements. Authentication processes use these credentials to establish confidence in an individual's identity through an eID system, often times requiring the presentation of a national eID card (OECD 2012). Consequently, the effective and efficient enrolment of national populations is vitally important, as is the production and distribution of eID cards where required.

Registration and card issuance processes have presented logistical challenges in many countries. This includes determining which institutions are responsible for registering personal information, and whether registration processes are to be centralized or decentralized. If registration is decentralized

then decisions must be made regarding who is responsible for overall coordination processes, and also how broader registration processes will be integrated. In Italy, for example, over 8000 municipalities are responsible for registration processes, maintaining data registries and issuing eID cards, while the Ministry of Interior has ownership and responsibility for managing the overall system; this includes coordinating other agencies involved in different aspects of the eID system including technical specifications and interoperability issues, eID card production, authentication processes, and so forth (Arcieri et al. 2004; OECD 2012).

Other issues associated with registration processes include safeguarding against multiple registration, fraudulent activities, the storage and management of data records, and the production and delivery of eID cards (OSCE 2009). Countries with large populations such as India, which has set itself a target of registering its entire population of 1.2 billion people by 2020 and where many residents have no identifying documents to verify their identity, have found enrolment processes particularly challenging (Gerdeman 2012).

After studying registration processes, the OECD (2012) concluded that there is no citizen registration process that is better than another as they are context specific and each reflects a country's style of government, history and culture. Governments were found to adopt a spectrum of approaches ranging from persuasion to coercion to encourage or mandate enrolment and the use of 'digital credentials' by individual citizens and public and private service providers.

Interoperability

A lack of interoperability in terms the standardization of technical specifications and implementation mechanisms has acted as a barrier to greater deployment of digital IDs for both government and non-government usage. Going forward, greater interoperability will be necessary to facilitate multiple applications in areas including health care, taxation, voting, social security, banking, telecommunications, and a range of online transactions (Arora 2008).

The OCED (2012) concluded that countries with centralised registration policies could address *interoperability* issues through the introduction of a national interoperability framework, while decentralized policy regimes could promote interoperability through federation agreements. Increased private sector participation in the design and development of IdM programmes can also help to overcome interoperability issues and encourage greater application of electronic IDs in the private sector.

The STORK project is a major initiative that is developing an eID interoperability platform for use in EU countries. The platform aims to provide public administrations with a cross-border eAuthentication service to enable EU citizens to use their national eID cards to access a range of government and non-government e-services across national borders. The STORK project is currently in a pilot stage, and is reported to currently be offered in 15 countries. The project indicates that in the future, EU citizens "should be able to start a company, get a tax refund, or obtain their university papers without [a] physical presence."[3] Within this context, the EU Standardisation Mandate 460 establishes standards for digital signatures and interoperability across EU countries.

[3] Source: https://www.eid-stork.eu/index.php?option=com_frontpage&Itemid=1

Security

The security of electronic data is a global issue. With national eID systems considered a form of critical national infrastructure, concerns exist regarding the vulnerability of eID systems to cyber-attacks (Aurora 2008). Fears of security breaches that could result in the misuse of data and identity theft have been key drivers behind public opposition to national eID systems. The OECD determined that governments generally addressed data security issues through the use of Public Key Infrastructure (PKI), supported by digital signature legislation to create legally-binding signatures which are considered a prerequisite for the widespread use of electronic IDs.

Privacy

The introduction of eID cards has frequently been viewed with skepticism and raised concerns regarding privacy and the potential misuse of data; some people view the recording of biometrics as particularly invasive. Moreover, many citizens regard the establishment of eID systems as an infringement of their civil liberties regardless of the security measures that are put in place. Notably, public backlash led to the withdrawal of national eID cards in the UK, and has obstructed attempts to introduce eID cards in a number of countries, including the US, Australia and France. Interestingly, the introduction of eID cards in other countries, such as Spain, has met with little opposition. In Spain's case it could be argued that the country's mandatory paper-based ID card introduced in 1944, together with the inclusion of a diverse range of stakeholders from the public and private sectors in the development and implementation phases of the Spanish eID card, have facilitated its introduction. Ouziel (2009) posits that, "Spain's historical legacies, the configuration of the state, and the country's political culture, have created a conducive environment for the electronic national identity card to be implemented."

With respect to *privacy* protection, the OECD study found that most countries relied upon existing privacy protection laws. Preventing the 'linkability' between databases of different government agencies is another means being used by governments to ensure the privacy of citizens is protected. One way of doing this it by ensuring each agency has a unique identifier (Arora 2008). In France, restrictions on inter-government databases have thus far prevented the introduction of a national ID card (Castro 2011).

National eID Systems as a Public-Private Partnership

While the main priority of IdM programmes is the implementation of e-government underpinned by eID systems, over the medium to longer term most governments also intend the impact to extend to the broader digital economy. Accordingly, many eID systems have both public and private-sector elements as governments seek innovative ways to extend the use of eIDs for secondary purposes in order to gain further utility from their implementation. To this end, the OECD (2012) contends that governments should avoid policies that restrict innovation within the broader internet community, and work to foster interoperability of eIDs with non-government identity solutions.

Many countries, such as Austria, Belgium, Malaysia, Portugal and Spain, actively promote the use of e-authentication and digital signatures provided through national eID systems in government-2-business transactions, as well as for e-commerce purposes. Estonia, Luxembourg and Sweden are examples of countries where national IdM strategies are reported to have been very successful in

encouraging private sector digital transactions supported by eIDs, particularly in the banking sector (Castro 2011; OECD 2011).

Governments have also entered public-private partnerships to develop and implement eID systems. In Norway, for example, a consortium of private banks manages the overall eID system, including developing technical standards. Sweden's eID system has been largely led by the government but implemented by the private sector. Moreover, the Swedish have the option of using government or private sector issued eIDs, with several private-sector providers authorized to issue eIDs (Castro 2011).

A major challenge for eID projects around the world has been managing the transposition of eIDs between utilities derived from accessing government services and those derived from market transactions. Issues once again relate to interoperability, privacy, data security, and the existence of a legislative framework including privacy and data protection laws and legislation to ensure electronic IDs can create legally-binding digital signatures.

These concerns have led some governments to develop technical and hardware standards to address interoperability problems. Other initiatives include the introduction of privacy-enhancing technologies, restrictions on data requirements (including on the duplication of data collection processes across government agencies), and policies that restrict the linking of various government databases that contain personally-identifiable data (Castro 2011).

To date, private sector participation in the design and development of national eID systems, and the application of national eID cards for private transactions has been limited (Arora 2008). Nevertheless, some countries are making inroads in this area. Spain's national eID card, introduced in 2007, provides a notable example of where digital identity data is being applied effectively in both e-Government and e-Commerce services. Aided by the passing of electronic signature law, Spain has ensured that verifiable electronic signatures are equivalent in law to a handwritten signature, with Spain considered an international leader in this field (Engfield 2006; MIT 2012). This has expedited the use of digital IDs in e-Commerce, with Spanish citizens now required to show their national eID cards when making credit card transactions and when accessing internet banking services. Spain has also addressed interoperability issues through the introduction of a national interoperability framework (OECD 2011; Engfield 2006).

Summary

Overall, a degree of ambiguity and conflict appear to be frequently associated with the implementation of national IdM programmes and their associated eID systems, including eID cards. Ambiguities arise due to, inter alia, confusion relating to population registration processes and the application and diffusion of eID verification technologies across government and the broader economy. Raising awareness of the potential applications and value of eID technologies is of key importance. Conflicts can occur on several levels reflecting, for example, citizens' concerns in relation to privacy issues, and the concerns of government agencies regarding the sharing of data and cost of infrastructure required to support eID systems. Policies and strategies adopted to implement national eID systems and respond to challenges are seen to vary according to context and reflect, inter alia, the culture, traditions, demographics, and style of government in each country.

Challenges Faced by the Emirates ID Authority

In order to facilitate the development of a robust and trusted national IdM programme in the UAE, Dr Ali Al Khouri, the Director General of the Emirates Identity Authority, indicated that a study of international best practices was conducted. The study revealed that the UAE had set itself a relatively broad remit in order to meet both national security and economic requirements. To help the Emirates ID Authority address the challenges it faced in establishing a national IdM programme and facilitate policy-making processes, an international committee was formed so the UAE could explore and learn from international experience and expertise.

The Emirates ID Authority reported that main challenges it faced in developing and implementing the UAE's IdM programme were population enrolment, eID card production and distribution, and the effective deployment of eID applications across government and private-sector organisations. These challenges are discussed below.

Population Enrolment

At the policy programme level, one of the greatest challenges the Emirates ID Authority initially encountered related to a core objective, namely that of effective population enrolment. While the national IdM programme was rolled-out in mid-2005, it only managed to enroll just over 10 per cent of the population, or 1.1 million people,[4] over a four year period (Al-Khouri 2011). During this time the Emirates ID Authority relied primarily on a social marketing strategy to enroll the population. This proved to be expensive and relatively ineffective policy tool. Particularly challenging segments of the population to enroll included nationals located in non-urban areas, and blue-collar workers residing in labour camps. Enrolment problems were compounded by the need to collect data for the entire population - including both nationals and a large and transient expatriate population - as no equivalent offline registry existed. Rapid population growth also served to amplify problems associated with daily intake capacities at registration centres (Al-Khouri 2011). Hence, the challenges the Emirates ID Authority faced were largely unique to the UAE context, as would be the solutions to these problems.

In the early days of the programme, the enrolment process was criticized for being 'hectic' and overly complex. It involved many activities that were lengthy to complete, thereby limiting the capacity of registration centres to process applications and leading to long waiting times.

Initially the enrolment process included a lengthy eight page enrollment form that collected a large number of data, not all of which was later considered necessary. Further to this, the process for capturing biometric data necessitated not only the presence of individuals at registration centres (online enrolment was not an option), but also the recording of all fingerprints (i.e. slaps, rolled prints, palm, and writer's palms).

A further challenge presented by the launch of a biometric based smart eID card was the system's significant infrastructure and resource requirements. Not only was specialised equipment required, but staff needed to be properly trained to accurately capture biometric data. Insufficient training was found to compromise the quality of biometric data captured and result in false data being recorded (Al-Khouri 2007). The routine nature of work and high staff turnover also proved a challenge.

[4] Source: http://www.uaestatistics.gov.ae/ReportPDF/Population%20Estimates%202006%20-%202010.pdf

Additional problem arose when biometric data previously captured was compared with newly captured data to verify a person's identity, as biometric data was found to sometimes change over time. This is especially true for people involved in manual labour - and hence for the UAE's large blue-collar population - as well as due to the effects of aging. Consequently, biometric data proved to be an unreliable form of identification over time for certain segments of the population if not updated intermittently.

Production and Distribution of eID cards

Another challenge encountered by the Emirates ID Authority related to the production and distribution of eID cards once registration processes were completed. Initially the technical infrastructure could only produce 7,000 cards per day, well below the number required to achieve enrolment targets. Problems were also encountered ensuring the reliability of biometric data on ID cards. Further problems were experienced with the distribution of cards due to the provision of incorrect or old information concerning delivery addresses, a situation exacerbated by the high proportion of expatriates residing in the country.

Deployment of eID applications across UAE Economy

A cornerstone of the eID system has been the implementation of electronic ID verification processes to create a 'trusted environment' for electronic transactions and service delivery. Dr Al Khouri explained that ID verification and the ability to attached digital signatures to documents are key in the delivery of e-Government services as well as other online transactions, and represent a necessary foundation for future growth in the wider digital economy. Nevertheless, by early 2011, the uptake of the Emirates ID Authority's eID verification services was limited, with the Abu Dhabi Police one of the few government departments reported to be using this service. Dr Al Khouri indicated that deployment problems reflected a range of issues including confusion on how to use the ID verification and authentication services offered by the eID system and integrate them into existing processes, as well as infrastructure costs and interoperability issues. There was also a need to promote a greater level of awareness and understanding of the potential applications and benefits of the new eID system across the government in the first instance, and then the private sector.

The Policy Innovation

In response to the challenges encountered in implementing the national IdM programme and rolling out the eID system, the Emirates ID Authority reviewed its practices and implemented a number of strategies to deliver service innovation and address what in many instances were unique challenges presented by the UAE's socio-economic and cultural environment. Key strategies for service innovation adopted by the Emirates ID Authority are outlined below.

Addressing Population Enrolment

An early review of problems encountered with population enrolment processes saw the Emirates ID Authority introduce a number of innovative changes at the programme level to streamline enrolment processes and better serve the public. This included reducing the length of registration forms by eliminating data considered unnecessary for identification purposes. A comprehensive training programme was also introduced for staff responsible for collecting biometric data. The decision was also made to require only flat fingerprints be recorded using smaller acquisition devices electronically linking with the Ministry of Interior's database to obtain and verify certain data. This

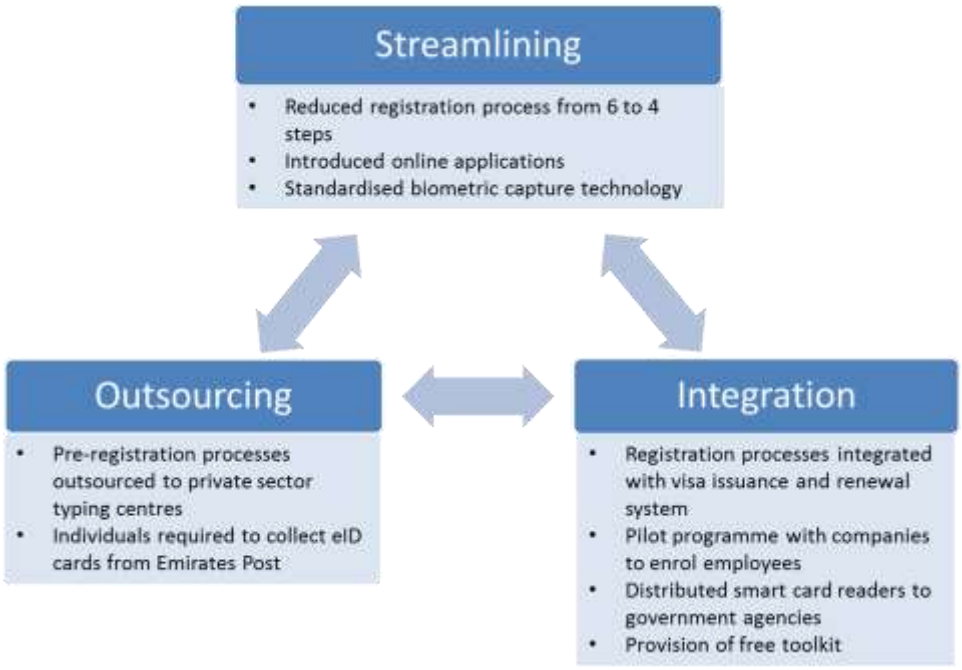
removed the need for registration forms in some cases, a process expedited on the political level by the fact that the Minister of Interior was also Vice Chairman of the Emirates ID Authority.

The policy system supporting the UAE's IdM programme was further strengthened when it was announced that the presentation of the new ID card for identity verification would become a pre-requisite for accessing a range of government services. This removed the purely voluntary nature of registration processes and effectively promoted a higher level of population enrolment. (Al-Khouri 2007)

Despite these changes, by 2009 less than a fifth of the population had been enrolled. As a result, the Emirates ID Authority embarked on a radical business process re-engineering project with the goal of enrolling the remaining UAE population within less than three years. The four guiding principles of the project were to increase efficiency, optimize costs, increase capacity and enhance the customer experience (Al-Khouri 2012).

The new strategies involved the introduction of a number of innovative policy instruments, shown in Figure 1 (below). These were designed to address the specific contextual requirements of the UAE, including its large expatriate population, and deliver cost savings while improving customer service, through a process of streamlining, outsourcing, and integration.

Figure 1: Emirates ID Authority's Innovative Policy Instruments to Address Enrolment Challenges



Innovations introduced to address the population enrolment challenges included the implementation of the following changes to the national IdM programme:

1. Streamlining Processes: Registration procedures were re-engineered to reduce enrolment processes from a six step to a four step process, online applications were introduced (with the exception of biometric data), and biometric capture technology was standardised.
2. Outsourcing Processes: Pre-registration processes such as the completion and lodgment of application forms, scanning of identification documents and paying of fees were outsourced to

commercial authorised typing centres that are widely present across all major settlements across the country. Data entered into e-application forms was then transferred to the Emirates ID Authority's verification office for cross-checking against the system of the Ministry of Interior. The use of commercial authorized typing centers represented a form of private sector engagement in the processing system and was aimed at reducing the cost of processing registrations.

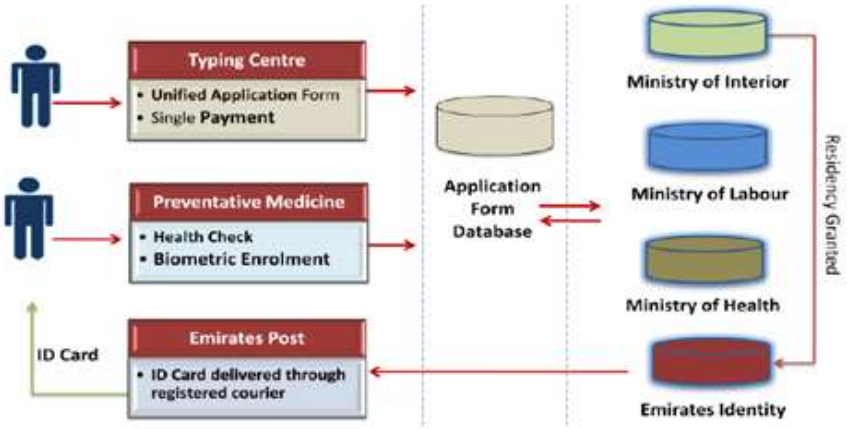
Card distribution processes were also changed so that Emirates Post no longer delivered ID cards, but citizens were required to collect cards from post offices thereby removing earlier problems resulting from the provision of incorrect delivery details. This resulted in further cost savings. Additionally, at the time of writing, the Emirates ID Authority was about to introduce automated kiosks in shopping centres to expedite future distribution processes and enable new cost savings. Once installed, people will be able to collect cards from specified kiosks by providing their application number and biometric authentication.

3. Integration: The Emirates ID Authority also linked the registration of residents for eID cards with the main 'nodes' of the visa issuance and renewal system. This included the opening of new registration centres at preventive medicine centres which facilitated the registration for eID cards by expatriates while applying for or renewing residency visas. This mechanism also ensured the registration of all expatriates within a maximum period of three years, the maximum term of residency visas in the UAE. A pilot programme was also launched with a number of companies where arrangements were made to facilitate internal processing of staff enrolments. Further to this, mobile registration centres were provided to register blue-collar workers, and communities of nationals located outside of urban areas.

   To promote the integration of the eID system across government and facilitate e-Government service delivery, smart card readers were distributed to government agencies. This was intended to promote use of ID cards and the Emirates ID Authority's electronic identity verification system across an increasing range of government transactions and service delivery. The Emirates ID Authority has also provided a free toolkit containing information on how government agencies can use ID cards and the eID system, and provides consultancy services to help agencies map their services through ID numbers.

Figure 2, below, illustrates the integrated population registration processes, merged with immigration processes, which resulted from the Emirates ID Authority's re-engineering project:

Figure 2: Integrated Population Enrolment Process



Source: Al-Khouri 2011

As the project progressed and the level of enrolments increased, Al-Khouri (2012) indicates that efforts focused on population enrolment began to shift towards service delivery related to authentication and identification processes.

Promoting the Deployment of eID applications

As part of a continued drive to improve customer service and promote the deployment of eID technologies, Dr Al Khouri indicated that the Emirates ID Authority is rolling out a number of initiatives aimed at including additional services and applications on national eID cards. Realising that using a 'build it and they will come' principle to develop a 'smart eID' had not been the right approach, the Emirates ID Authority is now actively engaging the support of other stakeholders across government and in the private sector in the development of additional applications for its eID technologies. Al Khouri explained that a key lesson the Emirates ID Authority has learnt is the importance of including a range of stakeholders from the beginning to help avoid some of the challenges it has encountered not only in enrolment processes but also in the roll-out of eID technologies and applications.

In this spirit, the Emirates ID Authority has worked with the Ministry of Interior to link the eID card to e-gate passes, a card that allows UAE citizens and residents quicker access through immigration processes at UAE airports. It is also working with the major telecommunication companies to link the national eID system to the issue of SIM cards and include digital signatures on SIM cards to facilitate mobile transactions. Further initiatives include the Emirates ID Authority working with the Ministry of Health to link the issuance of ID cards with birth certificates. In a project that is being conducted with the Health Authority of Abu Dhabi, the Abu Dhabi Health Services Company (SEHA), and National Health Insurance Company (Daman), the Emirates ID Authority is also making rapid strides in linking the eID system to healthcare records that will enable the accurate and reliable delivery of healthcare and related insurance services. The Emirates ID Authority's future plans also include using national eID cards as a platform to support UAE visas, driver's licenses, medical services and a range of benefit payments.

The Impact

Since rolling out the national IdM programme in mid-2005, the Emirates ID Authority has successfully achieved many of the objectives set out for the UAE's national IdM programme. At the programme level, the Emirates ID Authority has introduced innovative policy measures that have led to the successful enrolment of most of the national population, streamlined enrolment processes, increased registration capacity, reduced costs and enhanced the customer experience. Moreover, non-core business such as ID card application process have been outsourced to external service providers thereby allowing the Emirates ID Authority to concentrate on its core business of ID issuance and authentication. In the political dimension, the Emirates ID Authority has leveraged opportunities to drive efficiencies in government transactions while at the same time encouraging greater levels of population registration by announcing that ID cards would be mandatory for many transactions in the future. The Emirates ID Authority has also been mandated to link with the Ministry of Interior's database in order to obtain and verify ID data.

The implementation of the UAE's national IdM progamme has been aided by a general acceptance by the population that the government has the right to obtain and record personal identity data. This stands in contrast to the resistance encountered by many governments concerning privacy issues and the inappropriate use of data captured which in countries with a strong civil libertarian tradition, such as the UK and US, have hindered the successful implementation of national IdM programmes. While the UAE has largely avoided this type of problem, its greater challenge has arisen from the ambiguities surrounding the utility that can be derived from a smart national eID card and the IdM programme in general. This has included uncertainties concerning registration processes, the effective application and roll-out of the IdM programme, and the value-add of the programme to the population, government and business. The desire to better serve stakeholders has served as a driver of innovation for the Emirates ID Authority, leading it to develop and implement a range of innovative policy instruments to address these ambiguities and deliver value to stakeholders through the successful delivery of digital ID verification technologies.

As a result of re-engineering processes and service innovation initiatives introduced to the national IdM programme, the Emirates ID Authority reports that it has achieved impressive results. Firstly, population enrolment now stands at approximately 99%. Other achievements include an increase in intake capacity to 22,000 people per day, or approximately 4.5 million annually, representing a rise of around 300%. Registration times have been reduced by 80%, while applicants' waiting time has fallen by 1,000%. Staff turnover has declined by 60%, while customer satisfaction is estimated to have increased by over 50%. At the same time, revenues have increased by 400%, and overhead costs have fallen by 300%, underpinning the sustainability of strategies adopted (Al-Khouri 2011).

Discussing lessons learnt during the development and implementation of the national IdM programme, Dr Al Khouri indicated the key learning for the Emirates ID Authority has been to include more stakeholders in decision-making processes to determine better what data needs to be captured during ID registration processes. This includes the type of data required to enable seamless delivery of eGovernment and social services, as well as for the roll-out of the eID system to support the broader development of e-commerce.

Conclusions

National IdM programmes share many common goals in terms of national security and economic objectives, varying mainly in terms of the range and scope of applications they seek to provide. For countries where welfare payments represent a relative high proportion of GDP, the development, implementation and management of robust a national registry and eID system is crucial to accurately establish social welfare entitlements and ensure the efficient and effective delivery of government services.

Parallels can be seen in the challenges faced by governments in developing and implementing national IdM programmes. Differences lie in the specific policy instruments adopted to address these challenges and vary according to the unique conditions and operating environment within which national IdM programmes are being implemented. And while a generic approach to digital identity management would not appear to exist, evidence suggests that the introduction of digital IdM programmes is likely to be more complex and costly in countries that do not have existing offline systems.

The UAE's decision to develop national IdM infrastructure, including a national eID card, has led to the development of innovative policies, most particularly at the programme and political levels. These have successfully contributed to more efficient and cost-effective operations in the distribution of government information and services across the UAE. Moreover, the IdM programme has provided the eID infrastructure necessary to underpin both national security objectives and the development of the digital economy in the UAE. The introduction of a single smart eID card has provided a platform to support additional applications in the future such as UAE visas, driver's licenses, health services, benefit payments, and a variety of mobile payment system applications. Going forward, Dr Al Khouri indicated the Emirates ID Authority's focus will be on improving renewal processes for ID cards, updating identity data, and collaborating with both public- and private-sector stakeholders to explore new initiatives to further support e-Government and promote the development of the UAE's digital economy.

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