Executive summary of the case:

Abstract
e-Enabling Life Event Data

Civil Registration involves the recording of all life events - births, stillbirths, adoptions, marriages and deaths - which occur in the State. There are approximately 104,000 life events registered, some 400,000 certificates produced and 1.2 million searches of the records per year. The service was a manual, labour intensive paper based system and had remained largely unchanged since the mid 19th century.

As the Irish Government is committed to ensuring that modern technologies are used to improve the way services are organised and delivered to citizens the Department of Social and Family Affairs (DSFA) initiated three inter-linked projects:

- Civil Registration Modernisation Programme
- Child Benefit System Re-design
- REACH Inter-Agency Messaging Service

The fundamental objectives underpinning the three projects are:-

- the introduction of a modern civil registration service
- the sharing of life event data electronically between Agencies
- automated allocation, by DSFA, of a Personal Public Service Number (PPS No) to a child on receipt of electronic notification of a birth
- automated processing of Child Benefit claims following the allocation of the PPS No.
- delivery of integrated and e-enabled services for citizens
- re-engineer back office and legacy systems..

This was how a multi-task, cross-functional, intra/inter Agency initiative to deliver life centred services to citizens came to fruition in 2003. The focus of this submission relates to the Civil Registration Modernisation Programme and its role in the integration of Government Services and the e-Enabling of Life Event Data.

Case description:

Background

Civil Registration Modernisation Programme

The Civil Registration Modernisation Programme is a joint project between the Departments of Social and Family Affairs and the Department of Health and Children (with responsibility for the Civil Registration Service) aimed at introducing a modern Civil Registration Service. This was a major undertaking involving the:

- Introduction of technology - online registration/electronic certificate production/capture of digitised signatures.
- Redesign of business processes and procedures.
- Capture and retrieval of paper based records in electronic format.

- Reform of legislation.

A key step in the process was the publication of a consultation document entitled 'Bringing Civil
Registration into the 21st Century' (www.groireland.ie), setting out the context and proposed future
approach to civil registration and related services.

The registration of an event includes:

- The allocation of a Personal Public Service
  Number (PPS No.) to a child at birth.

- Registration, the setting up of a child's public service identity.

- The creation of family links on the national central database for all citizens.

- Client Records System - administered by the Department of Social and Family Affairs.

- The sharing of event data with other Government Agencies.

REACH Inter-Agency Messaging Service (IAMS)

An agency called REACH was set up by Government to develop a framework for the integration of public
services. A key building block underpinning the integration of public service delivery is the capacity to share
data between Government Agencies. A project to develop an Inter-Agency Messaging Service (IAMS) to
facilitate the e-enabling of life event data was undertaken.

Child Benefit System Re-design

The Child Benefit system is concerned with the administration and payment of child income support for
some 1,100,000 children. The redesign of the Child Benefit System encompasses the implementation of a
new service delivery framework which involves the re-engineering of back office systems - business
(processes/procedures) and technology (architecture, tools, development platform, redesign of legacy
systems) around customer access channels and the adoption of a pro-active/automated approach to
delivering customer services. Central to the pro-active/automated approach is the electronic transfer of birth
registration data to DSFA using the REACH Inter-Agency Messaging Service (IAMS).

The introduction of the new Civil Registration system is therefore a flagship project in providing life-centred
services to citizens. It enables a citizen to register an event e.g. birth, electronically and securely at a
location of convenience - hospital or local office. In conjunction with the redesign of the Child Benefit
system and the development of the REACH IAMS it facilitates the automatic triggering of the payment of
child benefit thereby providing a convenient and efficient service for the citizen.

Objectives

The e-enabling of life event data through the modernization of the Civil Registration Service is primarily a
customer service initiative. The focus being to:

- Deliver on Government’s objectives of providing more convenient access to services and information.

- Streamline the administration of the Civil Registration Service, redefine roles, responsibilities and authority
to improve the legal adequacy of data, processes and procedures.

- Provide an enhanced customer service by allowing for the registration of events and the production of
certificates in the citizen’s district of choice rather than in the specific district in which the event occurred.

- Reduce the reliance on paper certificates for Government service purposes through the electronic sharing
of life event data.
- Use life event data to provide seamless integration of services across Government Agencies data e.g. the auto-generation of child benefit claims by the DSFA following receipt of birth registration data and the allocation of the PPS Number, thereby eliminating the need for the parent to procure a birth certificate and submit an application for child benefit.

- Use modern technology to radically transform the way services are provided for the citizen e.g. browser based.

- Provide a platform for external access and services via the the internet for citizens.

- Streamline the administration of schemes/services - use life event data to trigger the review of continued entitlements under various Government programmes.

- Enact a new body of legislation.

**Resources**

Human Resources

The Modernisation Programme is overseen by a Steering Committee comprising representatives from various Government Departments and Agencies. The programme is managed by a programme management team (9 people), headed by a Programme Director, and consisting of representatives from the Department of Health and Children, Department of Social and Family Affairs and Accenture who were retained as consultants. The programme consists of four separate but interlinked projects -

- Legislation
- Organisation
- Technology and Historical Data Capture

With all projects reporting to a Programme Director.

Financial

The cost of Phase 1 implementation of the Civil Registration Modernisation Programme is 9.3m made up mainly of hardware, software, network, training, printing, consultation and consultancy costs.

Skills and Knowledge

The programme management team combines a mix of change management, project management, business and technical skills and is drawn from senior and middle management grades.

Accenture, who were involved in the technology and organisation projects, provided personnel with skills in programme management, change management, process design, system development and training.

The Historical Data Capture project team (approximately 40 people) provided skills in microfilming, scanning database and networking technologies.

The legislation project team (4 people) provided skills and knowledge in the drafting and enactment of legislation.

Use of ICT

The Technical Solution is a three-tier web based OLTP system built on the Microsoft platform. It uses leading Microsoft technologies including Windows 2000 Advanced Server, Internet Information Server 5.0, Microsoft SQL Server 2000, Microsoft BizTalk Server 2000 and Microsoft Message Queue.

In addition to the Microsoft Technologies, the system employs the Avanade Connected Architecture (ACA). ACA is a structured set of implementation classes and runtime services that support the development of web solutions on the Microsoft platform. This architecture was developed by Avanade (a joint venture
between Accenture and Microsoft) and provides a framework for rapid development of reliable and performant systems.

The solution is a browser-based "thin-client" application, which has the advantage of enabling quick and efficient rollout to registration offices nationwide, as well as ensuring that any upgrades that need to be made to the application will have no affect on the client machines.

Key features of the technical solution are as follows:

- **Public Key Infrastructure (PKI):**
  
  The solution uses Baltimore Technologies to provide security, user authentication and messaging. PKI is integrated into the online system by means of Java applets to ensure user authentication and non-repudiation of data entered onto the system.

- **Access Control:**
  
  The solution supports sophisticated role-based access control. Access groups have been identified and users are assigned to an access group based on their role. Buttons or hyperlinks to system areas appear disabled if a user does not have the appropriate access rights.

- **Network Connectivity:**
  
  Authorised users access the system via the Irish Government VPN (the first OLTP system to do so)

- **Historical Imaging:**
  
  The solution supports integration with a 2TB repository of scanned registration records, stored as TIFF images. An ActiveX component integrated into the system enables users to view, manipulate and print these TIFF images from their web browser, thereby supporting the issue of certificates for registration records, dating back as far as 1845.

- **Interfaces:**
  
  The solution uses BizTalk Server to interface with a number of external agencies for the purpose of data sharing. XML files are passed securely and reliably to Government Departments and Agencies via the REACH IAMS.

- **Digitised Signatures:**
  
  The solution enables customers to digitally sign birth, death and marriage registrations using an electronic pad and pen, known as an ePad. The ePad interacts with the system via an ActiveX control and the digitised signatures are then stored as part of the registration record.

- **Comprehensive Reporting Tool:**
  
  The Business Objects Suite is used to generate management and administrative reports and supports query reporting and analysis. Reports are accessed by users through a web-based interface.

- **On-Line Event Certificate Generation:**
  
  Crystal Reports is used, in conjunction with a custom built Active X control, to print client-side certificates, letters and receipts. An additional feature of the printing architecture enables the system to differentiate between printer trays. This is because certificates are printed on specially designed, highly secure pre-printed paper, while all other material is printed on plain paper.

**Open Standards and Interoperability**

The system is a combination of both custom development and off-the-shelf software, all of which use open technology standards both internally and for their interoperability with other system components. The main open standards used by the system are as follows:
TCP / IP
HTTP
FTP
HTML
XML
SSL
S/MIME
X.509
SQL
TIFF

The approach taken to sharing data across government departments has been to make significant use of open standards e.g. XML, SSL and TCP / IP for the transfer of data. The use of open standards ensures the solution can interface with systems built on a range of different technology platforms in use across Government Departments and Agencies.

Scalability

The system was designed and built on the basis of a three-tier architecture. This means that the application can be scaled "out" as easily as it can be scaled "up". The system has been designed so that extra servers can be added to any of the physical layers, thus giving the application the ability to further distribute the load and scale out through incremental addition of machines. The server hardware can also be upgraded by adding processors and memory, which provides the ability to scale up.

The system software itself has been designed for scalability and performance, it has been built using the ACA framework (mentioned above), which supports the delivery of scalable and performant applications proven by Avanade through extensive testing of both scale-up and scale-out scenarios.

Activities

Re-organisation

The Modernisation Programme consisted of four separate but inter-linked projects:

Organisation Project:

- Responsible for the design and development
- of a new organisation structure,
- roles and responsibilities for all staff,
- customer service delivery strategy,
- new processes and procedures,
- a comprehensive training plan for up to 300 staff,
- a detailed implementation plan,
- a communication and consultation strategy.

Technology Project:

- Responsible for the introduction of a modern technology solution to support the capture, storage, retrieval and sharing of both future and historical life event data. The technology project was also responsible for ensuring that the network infrastructure in the various organizations was capable of supporting the application, with particular emphasis on the downloading of TIFF images, without impacting on other applications.

Historical Data Capture Project:

- Responsible for the electronic capture of the historical life event data which involves the filming and scanning of the register pages to provide an electronic set of TIFF images.

Legislation Project:

- Responsible for the reform of the Civil Registration legislation in line with programme objectives.
Partnerships with Other Organisations

A key focus of the programme is the sharing of registration data with other Agencies and it has therefore been necessary to forge partnerships and close working relationships with other Government Agencies to guarantee implementation, examples are:

- **REACH** - in order to facilitate the sharing of data REACH, in partnership with the Agencies involved, developed the Inter Agency Messaging Service and envelope and XML message and data standards.

- **Central Statistics Office** - GRO is legally obliged to forward registration data to the CSO and has traditionally carried out this function on a manual basis. The new system, via the IAMS and Government VPN, now forwards this data electronically as the event is registered.

- **DSFA** - facilitates the allocation of PPS Number, Child Benefit claims processing, creation of family relationships, control of schemes/services etc. on DSFA systems.

- **Hospitals** - a common interface has been agreed with hospitals for the electronic transmission of birth data to the CRS system thereby eliminating the manual completion of paper forms.

- **Health Boards** - each of the ten Health Boards was involved at both business and technical levels particularly in the re-design of the network infrastructure and training of staff.

- **Health Service Employers Association (HSEA)** - the HSEA, as umbrella group representing the Health Boards, were involved in the resolution of industrial relations issues in partnership with the modernisation programme team.

- **External Companies** - A significant feature of the cross agency projects has been the mutual close co-operation of external companies employed across the various projects e.g. interface development, hosting service.

Innovation

Innovative features of the modernisation programme include:

- The creation of the national event database facilitates the seamless searching and retrieval, online, of historical (1845 - 2002) and new registration records using one application.

- The capture and storage in electronic format (scanned images) of historical records allows users to produce certificates electronically for all events without recourse to the paper based records. This is, as far as we are aware, the first implementation worldwide of this feature and has led to significant reductions in processing time.

- Registration and certificate production is not now constrained by location of event e.g. customers can register an event and request certificates at a location of their choosing.

- The sharing of data and consequent integration of services is a new and key development and has attracted interest from around the world.

- Use of electronic pads to capture and store, as part of the registration record, the customers signature.

- The security paper used for certificate production incorporates fourteen different security features e.g.

- Anti-scanning/photocopying, toner lock etc.

- The potential to link life events using the PPS Number.

- Integrated approach to development i.e. one programme with four inter-linked projects managed by a central programme management team.

- Outsourcing, to a managed service provider, of the hosting of the online application - a first for the Irish Public Service.
E. Government Implementation

Although there is a clear owner for each of the main developments mentioned earlier it was deemed advisable that co-ordinating groups and issue specific teams be set up to ensure that developments progressed in a timely and efficient manner. This proved to be very successful and has contributed to the smooth development and implementation of all systems.

From the outset it was recognised that the management of change would be critical to successful implementation. It was decided that users and customers should be involved in the development from the earliest stages and in effect take ownership for the future design of the system. Central to this was the design and implementation of staff and customer consultation frameworks. The steps involved publishing the consultation document in 2001, staff briefing sessions and meetings with individual interest groups. This was followed by the setting up of different user groups e.g. Programme Partnership Committees, local Implementation Teams and the issue of staff newsletters.

Output and Results

The development and implementation of the new civil registration processes/procedures and computer system has radically transformed the way business is carried out both within the civil registration service and within DSFA.

The implementation of the modernised civil registration service has resulted in the following improvements for citizens, staff and Government:

- Faster retrieval of event data and certificate production for new and historical records - reduced from twenty minutes to five minutes.

- Reduced requirement for certificates due to sharing of data with DSFA - a reduction of 55,000 birth certificates per annum in relation to Child Benefit system alone. This figure will increase dramatically as data sharing is expanded across the public service e.g. new passport applications amount to 200,000 per annum and each require at least one birth certificate.

- Better customer service through the impact of faster retrieval of data and certificate production, the reduced requirement for certificates, availability of certificates at any office, has resulted in significant improvements in customer service - less queuing, elimination of costs and travel time/expenses (due to data sharing and availability).

- Better quality data being captured at registration through greater involvement of parents/next of kin and inbuilt validations in the computer application.

- Secure storage of registration data. Where registration data is electronically passed to the civil registration service by hospitals the manual data entry requirement is eliminated resulting in timely capture of data and freeing up staff for other duties.

- The allocation of the PPS Number as part of the birth registration process and consequent updating of the civil registration record will allow for the future linking of life events and the production of life certificates using this unique personal identifier.

- Ready availability of management information including workload, statistics, trends etc.

- Reports produced by the system allow for the reconciliation of monies on a daily basis by region, office and user.

- Upgrade of networks across the various organisations has resulted in improvements in response times over a number of systems.

- Ready acceptance by staff resulting in major improvements in job satisfaction.
Streamlined Process/Functionality

The sharing of life event data is fundamental to the design, development and delivery of integrated services for citizens. The first example of the delivery of integrated services as a result of the modernisation programme is the automatic processing of Child Benefit claims by DSFA on receipt of electronic birth registrations. In respect of marriages and deaths registrations DSFA will update the client records on their database and notify relevant scheme areas of the change in status for appropriate action.

The above activities previously required manual intervention, either by staff or customers, at most stages of the process - PPS number allocation, certificate request/production, completion of CB application form, set-up and award of CB claim etc. The integration of services has in the case of the first child dramatically reduced the manual input and in the case of the second and subsequent child eliminated it altogether. This brings significant benefits for DSFA, staff and the citizen.

Central Statistics Office

The CSO receives life event data electronically in respect of all registered events. This reduces postage costs for the registration service, eliminates transcription errors and ensures more timely receipt of better quality registration data.

Longer Term Results:

Access by Agencies

It is planned to provide Government Agencies with online access to the registration service system in the future to verify event data as part of their claim/service processing. This will eliminate the need for citizens to provide certificates as part of the application process and consequently eliminate the need for the registration service to produce paper certificates.

Statistical Analysis

In the future it will be possible to carry out more rigorous statistical analysis of registration data e.g. trend analysis, year on year comparisons per region, local district etc.

Internet Access

The technical architecture/software solution has been designed to enable the development of an internet solution providing online access, by citizens, genealogists, emigrants etc, to registration data for both family research and certificate requests. It is expected that this will have a significant impact on the service and will generate large volumes of business.

Death Event Publishing Service

The GRO, in partnership, with REACH and CIS are developing a service which will publish details of death registrations via IAMS for Government Agencies who have a requirement for death data in the management and control of schemes/services. This facility, due to come on stream in the second quarter of 2003, will enable Agencies to better control expenditure on schemes, pensions etc. through the provision of more timely death registration data.

DSFA Schemes

The recent development of the Child Benefit system is the first implementation of the new Service Delivery Framework in DSFA. As the system is expanded to cater for other schemes they will be able to take advantage of registration data using the same technical solution designed for the CB system. This could include the auto-generation of widows pension claims, bereavement grants and could also identify potential overpayments on claims e.g. marriage registration data received in respect of a woman in receipt of Lone Parents Allowance.

Lessons and conclusions
Visibility

The new modern civil registration service has attained high visibility amongst both the private and public sector. Government Agencies, recognising the usefulness of the data for the integration and control of schemes/services, are queuing up to either receive the data electronically or be provided with online access to the application for administration of their day to day business. The sharing of data has impacted on citizens in that certificates will no longer be required for certain services and time spent queuing for certificates, when required, is greatly reduced.

Single Vendor Technology

End to end use of single vendor technology was seen as an advantage as opposed to using multiple best of breed products which require integration. Strong vendor support was received throughout the development making issues easier, cheaper and faster to resolve.

Standards

It is important that data and other technical standards are set and agreed early in the development process. This is particularly vital where inter-dependent developments are taking place simultaneously in different organisations. One organisation should be mandated to ‘own’ the standards and ensure that they are adhered to by all. REACH were mandated to agree, set and own the data, envelope and XML message standards and this proved very successful in the development and implementation of the various strands/projects associated with the modernisation programme.

Encryption/Error Handling

In relation to agency to agency communication and data sharing encryption processing and error handling proved to be a more complex task than originally envisaged and was more difficult to do than the actual application development. It is important that sufficient time and resources be assigned to each to ensure successful development and implementation.

Multiple Projects/Project Governance

Where multiple projects are involved they must be planned and developed in a co-ordinated and agreed manner i.e. strong Project Governance is required. The co-ordinating groups, set up as part of the modernisation programme, met on a regular basis to ensure that issues were identified and resolved on a timely basis and the various projects were developed in the agreed manner. It is important to note that as the number of agencies involved increases the time taken for development and testing also increases.

Data Conversion

The capture, clean-up, migration and conversion of historical index data was a major task and took up more time and resources than originally envisaged. This was mainly due to the fact that the data was originally indexed to support paper based retrieval and the data format was not consistent across all years. Ideally, more time should have been given to analysing the paper-based data prior to the commencement of the electronic data capture process.

Scope

As with a lot of information technology projects requirements changed during the development and user testing phase. Accordingly, ‘scope creep’ needed to be managed very carefully to minimise impact on ‘go-live’ date. A change control process was put in place whereby all changes had to be approved by the Programme Management Group. A clear distinction had to be made at various stages between changes which were deemed essential and those which were deemed ‘nice to have’.

Technology/Business Requirements

A decision was taken, at a early stage, that the business requirements would drive the technology project rather than the other way round. This ensured that the business requirement would take precedence and that the most appropriate technology solution would be used to implement them.

Parallel Running
The opportunity for parallel running of the manual and electronic systems in a ‘live’ environment should be taken prior to full implementation to test system functionality, validate process/procedures and training programme and user and customer acceptance of the system. This was carried out over a four week period with the various functions being introduced, tested and monitored. This proved invaluable and raised a number of issues which were resolved prior to implementation.

Change Management

As the civil registration service was changing from a manual paper based system to a modern electronic system, fundamental changes were required to the organisation as a whole. As this would have a major impact on the way in which staff carry out their work and effect the smooth changeover to the new systems and procedures a staff and customer consultation process was implemented from the outset.

Cross Departmental Developments

Where cross departmental projects are being set up the roles and responsibilities of all parties should be set out and agreed at the outset and a structure put in place to resolve issues and difficulties. While it wont eliminate hiccups along the way it will ensure that the proper mechanisms are in place to resolve them.

Legislation

Development must conform with legislative framework. Early identification and resolution of issues is required to ensure that new legislation is enacted in sufficient time.

References and links

Access to the civil registration system is only available over the Irish Government VPN. THE URL for access to the site is www.gro.ie.

Further information on civil registration and the modernisation programme can be found on www.groireland.ie.

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