Multi-channel delivery of eGovernment services

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Management summary

The study “Multi-channel delivery of eGovernment services” investigates the successful delivery of pan-European government services by means of a multi-channel approach.

Because success in service delivery depends on a vast range of parameters, there is no single formula or solution that fits all situations.

Better services and/or cheaper service provision.

A multi-channel strategy can address two objectives faced by today's public bodies: improving the services provided to the user community and/or reducing the costs of providing its services.

Meet user requirements by providing services that are flexible, accessible, complete, easy and secure.

Users want services to be flexible, accessible, complete, easy and secure. User profiling will show that segments such as disabled persons have specific requirements. A user’s channel preferences are influenced by circumstances such as the nature of the service required, or his need for direct, person-to-person interaction.

Save costs by improving efficiency.

Providers can save costs by implementing channels that increase efficiency and effectiveness. Business process redesign, back office integration and component re-use will help to achieve cost benefits. At the same time, administrations must comply with technical, organisational and legal conditions.

Design a channel strategy within the framework of an architectural model.

A successful channel strategy depends on an architecture that allows channels to interoperate instead of merely co-existing. The architectural model must ensure integration of channels and applications as well as the re-use of generic service components.

Select a suitable channel by matching requirements with channel features.

Channels range from traditional channels such as the counter and telephone to e-channels such as internet, e-mail, SMS-messaging, interactive voice response systems and digital television. The channel selection framework offered by this study helps an administration in matching the features of these channels with the specific requirements of its user community. The solutions described in the Conclusion chapter show solutions that meet the main objectives of better services and reduced costs.

e-channels show major benefits, but channels for direct interaction are still required

E-channels play a major role in achieving significant benefits for the user as well as the provider. To overcome a possible digital divide for user segments without devices for accessing internet-based information at home, public internet access points and possibly interactive digital TV are essential. Channels for direct interaction, e.g. counter and telephone services, are still required to allow communication about complex or urgent issues.

Determine the objectives of providing a variety of channels

An administration’s first step in defining a multi-channel strategy consists of determining its objectives: why does it want to offer a variety of channels. Only if it has a clear vision of *why* it wants to implement new channels can it make properly motivated choices in terms of *which* channels it should implement and *how* it can redesign its services to reap the optimal benefit of the new channels.

Develop a business case to allow rational decision-making.	Before implementing a multi-channel strategy, an administration should develop a business case in which it analyses objectives and solutions, and quantifies all relevant parameters in terms of expected investments and results. This will allow rational decision-making and later assessment of objectives. Moreover, awareness creation and promotion, as well as post-implementation measures such as customer satisfaction assessment and cost/benefit analysis require attention.
Take into account the impact as shown by available best practice cases.	Expected benefits should be verified in the light of experience from actual practice. Available best practice cases show benefits such as increased accuracy, faster services and shorter waiting times. Moreover, administrations can achieve cost savings due to reductions in staff, less paper work, more efficient business processes and the re-use of service components.
Pan-European services such as the eu-portal can benefit significantly from multi-channel aspects.	Pan-European services like the portal of the EU administration ("Your Europe") can benefit from a multi-channel approach. However, further analysis is needed to take into account the specific nature of such services.
A well-balanced approach can meet the needs of users, while at the same time achieving cost savings.	As shown by best practice cases and the solutions described in the Conclusion of the study, the choice of a channel does not mean that the needs of the user community are addressed at the expense of the needs of the provider, or vice versa. A well-balanced approach can actually satisfy both sets of objectives: i.e. it can improve the way in which the needs of users are met, while at the same time it can achieve cost savings. The best practice cases also show that if requirements of users are met, citizens and businesses feel that they are receiving better services. Subsequently the administration delivering the service is perceived more positively.

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1 Introduction

1.1 Rationale for this study

During the last decade, users have become accustomed to new means of service delivery in the private sector. Nowadays, users expect the same level of variety from the public sector: they want their interactions to be convenient, and they prefer to be online rather than in line. To meet this expectation, administrations need to deploy a variety of channels for their service delivery – channels that allow users to consume their services anytime, anywhere and anyhow.

New developments in ICT allow the public sector to meet these challenges by adapting their front and back office: new ways of interaction through a variety of channels, restructured services that accommodate their users' needs, and re-organised business processes within and between separate administrative bodies. The eEurope Action Plan 2005 refers to these developments as follows: "*Multi-platforms must enable users to benefit from new technologies and infrastructure improvements such as broadband. Moreover, alternative access platforms will facilitate e-inclusion, also for people with special needs.*"

To assist administrations in implementing a multi-channel strategy, the IDA Programme commissioned a study on multi-channel delivery of eGovernment services.

1.2 Objectives of a multi-channel strategy

In September 2003, Erkki Liikanen, European Commissioner for Enterprise and Information Society, expressed the challenges faced by the public sector as follows: "*Citizens expect faster public service delivery, companies want administrative burdens to be reduced, and public bodies need to raise productivity in order to deliver better and faster services within tight budgets.*"

Expressed in terms of objectives, these challenges mean that public sector bodies must:
- improve the manner in which they serve their user community;
- reduce the costs of providing its services.

The first objective focuses on the needs of the user. User-centric services are easily accessible for all segments of the community and offer flexibility in terms of how, when and where they are accessed. Moreover, they are transparent, efficient and secure. The second objective requires public sector bodies to make their service processes and their delivery more efficient. Usually, this will involve a re-organisation of their business processes and the structure of their back and front offices.

Prioritised attention for the needs of the user community is of crucial importance if the administration has a poor image in terms of the quality of its services, or if certain segments of the community have been excluded. On the other hand, the requirements of the administration are likely to be placed on top of the list when service provision is inefficient, or when transfer of information from one department to another slows down the process and is a likely cause for errors.

As this study demonstrates, the choice of a channel does not mean that the needs of the user community are addressed at the expense of the needs of the provider, or vice versa. A well-balanced approach can actually satisfy both sets of objectives: i.e. it can improve the way in which the needs of users are met, while at the same time it can achieve substantial cost savings.

Because success in service delivery depends on a vast range of parameters, there is no single formula or solution that fits all situations. In some situations, a wide variety of channels may be needed, whereas in other situations, a limited number or even a single channel will suffice.

1.3 Structure of this document

This document serves a number of purposes. It combines a theoretical analysis of requirements and channel features with the practical guidance of channel selection and implementation. At the same time, it briefly addresses the issues at stake for pan-European multi-channel implementations. In addition, best practice cases show the impact of actual implementations and the lessons that can be learned.

While the theoretical part of the document remains neutral and helps an administration in making its own selection of channels in the light of specific requirements of its user community, the Conclusion contains tables that show general solutions for the objectives stated in the previous section.

Chapter 2 describes the considerations that should be taken into account when assessing user and provider objectives. In addition to general requirements, the section on user segmentation describes factors such as age group, ethnic background and specific requirements of disabled persons.

Chapter 3 investigates the features of an architecture that must enable a multi-channel approach. Critical success factors that play a role in this architecture are the level of integration of services as well as issues such as the re-use of generic service components.

Chapter 4 describes individual channels. Because issues such as e-exclusion are very relevant in the context of government services, attention is also paid to channels that can bridge a potential digital divide.

Chapter 5 offers guidance in matching user and provider requirements with available channel features. The framework offers a set of practical steps, preceded by considerations that are relevant in making choices. In addition, it covers relevant cost/benefit issues.

Chapter 6 provides guidance for implementing a multi-channel strategy. It discusses pre-implementation aspects such as developing a business case and awareness creation, as well as post-implementation aspects such as customer satisfaction assessment and cost/benefit analysis.

Chapter 7 describes a number of practice cases of multi-channel solutions. Of particular importance in these cases is the element of impact, showing the benefits of implementing a multi-channel approach.

Chapter 8 describes the impact for pan-European eGovernment service delivery, in particular the web portal “public-services.eu” and the IDA Architecture Guidelines.

Chapter 9 lists the key findings, shows which channels offer the best solutions for the various objectives and discusses the expected impact of these solutions.

The bibliography consists of an extensive list of relevant, easily available literature and URLs of relevant sites. The extensive index at the end of the document facilitates access to particular topics.

Quick reference overview

Type of information	Sections to read
The gist of the document, to be consulted in a limited amount of time	grey boxes and chapter 9
Thorough analysis of user and provider requirements, architecture and channel features, leading to a model for channel selection	chapter 2, 3, 4 and 5
Implementation guidance	chapter 6
Best practice cases, their impact and lessons to be learned	chapter 7
Impact for pan-European eGovernment service delivery	chapter 8
Suggested solutions for a number of objectives	chapter 9

1.4 Methodology applied during the study

A significant part of the study activities consisted of desk research of available literature, relevant websites, study results and case studies. Whenever required, analysis of this material was followed up by telephone or face-to-face interviews. Each of the best practice case descriptions was verified by the "owner of the case", i.e. representatives of the administration that provides the service.

The draft version of the study was reviewed by a panel of representatives from the European Commission, comprising Enterprise DG's IDA Unit, Information Society DG, and the Commission's Publication Office.

The study was conducted by specialists in the field of government services and multi-channel architecture, employed by TechText in Amsterdam.

1.5 General concepts and definitions

Service — In the scope of this study, a *service* can be described as a business transaction between a public administration and a user.[1]

Service delivery — The interactive part of the service, i.e. the interaction between the user and the administration, takes place during the *service delivery*. When, for example, a citizen applies for a subsidy, provides the relevant personal data, and receives the subsidy, there is interaction with an administration, whether in direct contact (e.g., at the counter) or in indirect contact (e.g., on a website or through an intermediary). The interaction takes place over so-called channels such as the counter, telephone, e-mail, regular mail or interactive digital TV.

Channel — A *channel* is a means used by an administration to interact with and deliver services to its users. When two – or more – channels participate in a single service provision, the compound channel is often referred to as a "hybrid channel". For example, an employee entering a user's data into a web form on his PC, while talking to the user at the counter or

[1] The term "user" includes citizens, businesses and organisations as consumers of public services.

over the telephone. A more detailed definition of the term channel is given on page 20.

Front and back office

Service delivery, i.e. interaction between the administration and its user community by means of channels, takes place in the administration's *front office*. Service delivery activities can also take place at moments where there is no direct interaction between the user and the administration. When, for instance, the income tax data that a citizen has provided is being checked against other data or when tax returns are calculated, there is no interaction between user and administration. Processing of services takes place in the administration's *back office*, where one or more internal or external departments may be involved.

2 Service requirements and service delivery

At its simplest level, only two parties are involved in providing a service: the user and the provider. Each of these two parties has its own requirements. The user is likely to want ample choice and easy access at minimal costs. On the other hand, the provider probably wants to improve efficiency and reduce costs.

Because there may be conflicts of interest between these differing sets of requirements, an administration needs to set priorities and make choices, and to do so, it needs to have a clear view of its objectives. In assessing the general user and provider service requirements that are described in sections 2.1 and 2.2, it is assumed that an administration has considered and defined the objectives of its organisation and its activities.[2]

A user's perception of a service is related to all aspects of the service, i.e. the service (product) itself, the contacts with the service provider and service delivery. To optimise the quality of services and to attain full service integration, the provider must integrate its delivery channels and its processes (section 2.3).

An administration's user population is not homogeneous: services may differ according to specific users and individual user requirements may differ. Because users expect services to be tailored to their individual needs, user segmentation must play an important role in service delivery (section 2.4). Segments should be determined in relation to the services an administration provides.

2.1 General user requirements

When a user interacts with a public administration, one of his roles is that of "consumer" of public services.[3] As there is normally no competition in the public sector, the jurisdiction responsible for the user defines the service characteristics and subsequently the local administration merely provides the service.

New developments in ICT create opportunities for administrations to offer new ways to interact with their users. These opportunities allow them to address the requirements of users who have become accustomed to new means of service delivery in the private sector.

The general user requirements can be classified as follows:
- flexibility
- accessibility
- quality
- security.

Section 2.4 discusses a more specific analysis of needs in terms of user segmentation.

There will usually be a trade-off between the requirements. For example, a user may accept a lower quality of the service he requests, if a new channel offers him more flexible service delivery.

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2 The requirement categories used in this document are based on analyses of a number of documents, including Top of the Web, the UK's Channels framework, Prisma Strategic Guidelines and SIBIS-reports.

3 Other roles include the role of subject of the state and carrier of democratic rights.

Flexibility: anyhow, anytime, anywhere

1 Technological developments have introduced a wide variety of new channels over which contact can take place between a user and an administration and that permit different forms of contact. Web technology, for instance, has introduced e-mail, which in many situations has replaced regular mail, although it is less direct than the telephone. Websites have opened the possibility of consuming services by means of self-service on a 24*7 basis. Moreover, mobile technology makes it possible to consume services irrespective of location. Interactive digital TV promises to be a valuable channel for reaching large numbers of users who otherwise may avoid contact with the administration.

2 Many service delivery processes consist of two or more interaction sessions between the user and the administration (e.g., applying for a new passport and picking it up). If the administration is flexible in terms of its service delivery, it will allow the user to choose the channel or location for the interaction processes, and allow him to switch between channels at any time he wishes to do so.

Accessibility

1 Users (citizens, businesses and systems) should be able to locate the required services. In order to make services findable, different kinds of measures may be needed, such as general awareness creation and semantic and technical measures aimed at resource discovery.

2 Users should be able to identify the channels that they can use to access the service they need. With multiple channels, flexible opening hours and multiple locations, users cannot know all channels that are open to them for a particular service. Service providers should help them in locating, choosing and accessing the channel of their preference. A simple but effective example is the introductory page of the Service Canada website (http://www.servicecanada.gc.ca/en/menu.shtml), which uses the “call - click - visit” icons to present the three one-stop access portals.

   The advent of multiple channels and flexible opening hours has given rise to new forms of service provision which, at least from the point of view of the user, amount to entirely new services. For example, a service that enables the remote monitoring of asthma sufferers or a service that provides a 24 hour home care service to elderly and disabled people through the use of call centre technology (both funded by Europe’s *e*TEN programme).[4]

3 Once a service is located and accessed, users should be able to consume (read, understand, process, etc.) the information provided by the service and it should be usable to all members of the intended user community. The presentation of the service should be user-oriented. If the level of usability is low, the user may have access to the service, but he may not be able to consume it.

4 The legal basis of public services stipulates that they must be accessible for *all* potential users. If a user is legally entitled to a service, the administration is legally required to deliver the service.

5 A pricing policy for services should guarantee that the intended target groups can afford the services.

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[4] http://europa.eu.int/information_society/programmes/eten/about/leaflet/index_en.htm

Quality

1 In practice there are many situations in which a user needs more than just one service to deal with a particular situation. In a one-stop shop approach, a single interaction would be able to address all requirements, thus saving the user a considerable amount of time.

When departments cooperate and when the services they provide are integrated, the quality of their services will be significantly enhanced. Data that is known in one department can be re-used in another, services can be tailored to the personal needs of the user, and new services can be offered.

To raise the level of services, many Member States make use of "life events" (for citizens) and "business episodes" (for enterprises). Both terms refer to situations in which one or more services are needed. A life event or a business episode triggers public services or interactions with public authorities. By bundling public services around life events and business episodes, users can remain focused on their needs instead of having to deal with the functional fragmentation of the public sector.

2 Public services are usually regulated by means of strictly defined specifications. Strictly speaking, quality can be described as satisfactory if the service is provided in conformance with the relevant specifications. The product quality can be measured against the product specifications, including the quality of the product itself, and the time needed to deliver the service. This way consistent service provision is guaranteed.

3 In a user-centric approach, services must be offered pro-actively. A timely service is a service that is offered at the moment a user may need it, even though he may not yet be aware of it. Users increasingly favour notification services.

4 Quality comes at a price. For example, faster delivery of a service may involve more costs than delivery at a regular speed. Some users are willing to pay the price for fast delivery, to others the higher price means that they will accept longer waiting times if the service is free.

The user determines what factors (e.g., speed, convenience, price) are important to him and whether each of these factors has the same importance. The mix of factors and their importance will vary on a case by case basis.

Security

1 A trusted exchange of information depends on an assured security level. If a channel is not secure, or if users don't trust its security, the channel will not be used for services that involve sensitive information.

2 Security is not only a technical matter, it is also one of perception. Due to a lack of trust in security matters, relatively large segments of the user population are less inclined to use channels that they don't fully trust, especially when payment is involved.

General user requirements can be classified according to:

- Flexibility
  Users should be able to access services anyhow, anytime, anywhere.
- Accessibility
  Users who are entitled to a service cannot be refused, users should be aware of services that are of interest to them, services should be findable, usable and affordable.
- Quality
  Services should be based on product specifications, they should be timely and user-centric, and they should provide value for money.
- Security
  Services and service delivery should be trustworthy and confidential both objectively and in the user's perception.

2.2 General provider requirements

One of the tenets of modern public service delivery is that it is user-centric. Within the confines of their task description, administrations must provide their users with the services they need and over the channels they prefer. In short, to provide quality services, providers must pay serious attention to the general user requirements.

However, because financial, organisational and technical resources are not unlimited, it is not possible to deliver services that are tailored to each individual user. User requirements must, therefore, be in balance with requirements related to the provision of services.

The general provider requirements can be classified as follows:
- efficiency
- effectiveness
- security & reliability.

Efficiency

1 Efficiency in service processing and service delivery should lead to cost benefits for both the administration and the user.

  In many cases a substantial amount of data is retained by back and front office functionality for possible future re-use (e.g., personal and progress data. A relevant consideration here is whether privacy legislation allows particular data to be kept on record and shared. This kind of legislation, however, may vary from country to country.

2 The quality of services is enhanced if they are provided in a time-efficient manner. Time-critical information is *only* a quality service if it is provided on time, i.e. when needed (the service content, even if of the highest quality, is useless if not provided on time).

3 Efficiency measures should not interfere with effectiveness. Co-browsing promises to be an efficient add-on channel to provide support to users using a website: a call centre agent can handle up to five or six simultaneous contact sessions by working with a predefined response library.

Effectiveness

1 The intended target groups must be reached. This is especially relevant for services that are initiated by the administration and that the user may or may not know about. In this case the service provider must use a channel that actually reaches the individual user. An

example of a channel that suits this purpose is addressed mail, although the service provider cannot know for sure whether the user opens, reads or understands the content.

2 The intended target groups must be able to consume the services. The user must be aware of the channel, he must have access to the channel, he must know how to use the channel, he must be willing to use the channel and the service must be understandable.

When a channel is implemented, particular attention must be paid to characteristics of the target groups in relation to the characteristics of the channel and the way it is implemented. For example, a poorly managed call centre with long waiting lines will frustrate users and perform poorly in terms of ease of access.

3 The introduction of new electronic channels enables new forms of service provision. To the user these new forms of service provision may even amount to entirely new services. Because electronic channels have low transaction costs, services can now be offered that were previously not possible due to high costs, and services can be offered to segments of the population that previously could not afford them.

Not all members of the target groups may have access to all the new channels, and therefore, care must be taken not to create a new societal divide. Participation and inclusion can be improved if services can be accessed through different channels (internet, mobile phones, etc., alongside more traditional offline service provision) and contact points.[5]

Security, reliability

Service providers must always ascertain that the service delivery process does not threaten the privacy, security, or confidentiality of data subjects or contributors. Reliable identification, authentication and verification are crucial if the service delivery channels are to be accepted by the general public.

General provider requirements can be classified according to:

- Efficiency
  Re-use must lead to cost benefits, cost-efficiency should not be detrimental to effectiveness.
- Effectiveness
  Channels must connect services with their target groups, target groups must be able to access the services, (e-)inclusion must be raised.
- Security
  Services and service delivery should be trustworthy and confidential both objectively and in the user's perception.

2.3 Channel and process integration: two sides of the same coin

As can be deduced from the general user requirements, it is difficult to draw a clear line between a service (the product) and the means of service delivery (the channel).

[5] One of the targets of the eEurope 2005 Action Plan is that by the end of 2004 Member States should have ensured that basic public services, where relevant, exploit the potential of multi-platform access.

A channel can change the user's perception of a service. For example, going to an office, waiting in line to get an application form, filling in the form and handing it to the employee who sends it to the back office for further processing, constitutes the same service as downloading the application form from the office's website, filling it in and returning it by mail, or even the same as filling in the form on the website and clicking OK.

Channels can also add value to, or subtract value from, the service from the point of view of the user. The introduction of new means of service delivery may make services accessible that hitherto had been more or less unavailable, due to high costs, lack of staff, etc. For example, the remote monitoring of patients is an area where new technology could play a major role in providing round-the-clock services.

When users have a free choice between different channels to access a service, they will choose the channel that realises the highest relative value for them. The specific channel may vary according to the situation. When time pressure plays a major role, a user will choose the fastest channel; under normal conditions, he may choose the cheapest option.

From the point of view of a service provider, it is easier to separate the service from the actual service delivery. Services are processed in the back office where no direct interaction with the user takes place. The provision of services, the interactive part in the service delivery process, takes place in the front office, where one or more channels can be used.

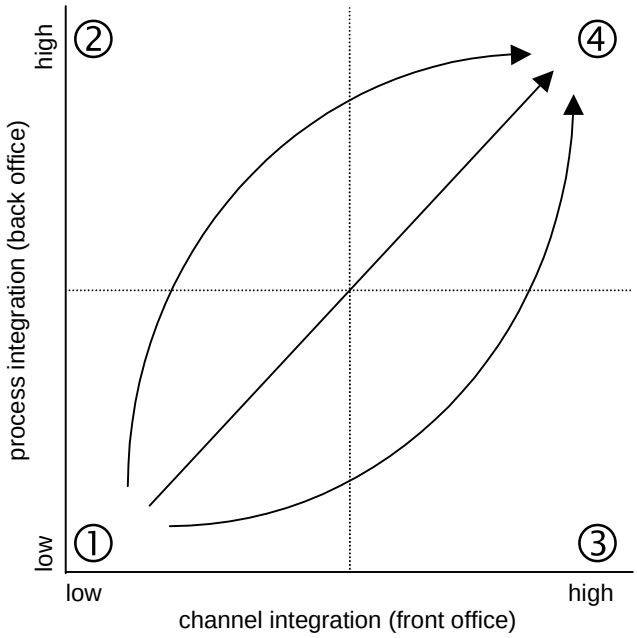
To increase the quality of its *services*, an administration should have its service processes more integrated, e.g., by reorganising its organisational structure or by more cooperation between internal and external departments. Whatever method is chosen, they should all be aimed at reducing or eliminating functional fragmentation. To the user the integration of service processes means new and better services, to the service provider it means higher levels of efficiency (reduced costs).

To increase the quality of its *service provision*, an administration should increase the level of integration of its delivery channels. If channels are integrated, the introduction of a new channel is not merely an additional channel but a new opportunity to improve service delivery, e.g., by offering the user more flexibility. One of the elements of realising this integration is the introduction of a central database with basic user data that can be accessed by all channels.

To the user the integration of channels means more accessible and more flexible service delivery (which leads to better services); to the service provider it means higher effectiveness and efficiency (target groups can be reached more precisely, with lower costs).

When service processes as well as delivery channels are integrated, full service integration becomes possible by means of a high quality, accessible, flexible, cost-efficient and effective one-stop approach.

The following diagram compares a low and high level of channel integration with similar levels of process integration.



No matter which "route" an administration takes to attain full service integration (quadrant 4), the aspects of security and reliability need constant attention. User privacy must be secured while at the same time separate identification procedures for each service and/or each channel (with the corresponding multitude of user names and passwords) should be avoided as much as possible. Identity management must play an important role.[6]

Full service integration enables administrations to provide high quality services that are easily accessible and flexible (user interests) in a cost-efficient and effective manner (provider interests). Full service integration presupposes channel and process integration, with a keen eye on security aspects.

2.4 User segmentation

An administration's user population is not homogeneous, nor should it be treated as such. To be able to deliver quality services, services should be tailored to the needs of individual users, as far as this is possible. Although one-to-one service provision may be a thing of the distant future, user segmentation is a very valuable step in the right direction.

User segmentation means that the user population, ideally per service or group of related services, is subdivided into more or less homogeneous, mutually exclusive subsets of users who share an interest in the service(s). The subdivisions are based on one or more user characteristics. The segments are then "targeted" in the most suitable way over the most appropriate channels.

[6] E.g., the Belgian federal government introduces a single sign-on identification service that allows users to access different services with one name and password during a single contact session. The Irish government introduces the "Personal Public Service Number", that will be allocated to newborn infants as part of the birth registration process.

It is crucial that every administration, whether at the local, municipal, regional, national or European level, has a clear view of its users in relation to the services it offers, and that it knows how these services, or service steps, will be accessed.[7]

To attune users and services, the following steps are advised:

1 determine criteria for segmentation and define user segments;
2 determine the segments that are relevant for a service or cluster of services;
3 determine the best way to offer and deliver the services to the users in the respective segment(s).

The best basis for determining segments is the data about users that are held by or that are available to administrations. Within the limits of privacy legislation administrations essentially collect data that are, or may be in the future, relevant for the services they provide.

Common criteria to segment the user population are:

- demographic characteristics (e.g., age, gender, urban or rural based, region);
- socio-economic characteristics (e.g., income, class (citizens), sector, number of employees, volume of business (businesses), channel access);
- psychographic characteristics (e.g., life style, values, sensitivity to new trends);
- individual physical and psychological characteristics (e.g., disabilities, attitude, loyalty).

Some data are "objectively" observable (e.g., gender, income if based on tax declaration, preferred contact channel if based on actual use), other data are not (e.g., personality, values). Especially the latter should be collected and interpreted with great caution.

User characteristics differ according to the circumstances and they change over time. This is one of the reasons why users should be offered a choice of channels when they access services. For example, when a user has no or only little experience with a service or when the service he seeks to obtain is complex, he is likely to choose a channel with personal contact. Later, when he has consumed the service a number of times, he may prefer a faster, although impersonal, channel such as the internet.

By segmenting their user populations, administrations are in a better position to tailor their services to their users' needs. Thorough knowledge of their users and a valid interpretation frame are essential.

Service analysis is necessary in order to identify the most important channels for service delivery. For example, highly standardised services may primarily be offered over indirect channels such as the internet, whereas very complex services will require personal contact.

User monitoring ensures that individual user preferences are recorded and, if possible, acted upon during the next contact session.

As segmentation becomes more sophisticated, administrations will be able to deliver differentiated services that will be based on increasingly individualised user segments.

Although relatively new in the public sector, segmentation is gaining acceptance. A few examples of basic segmentation on national portal sites:

[7] For more information see p. 2.

- The European portal, http://europa.eu.int/public-services, “provides information and services to assist Europe’s citizens and enterprises in carrying out cross-border activities.” On the main menu the user can choose the relevant segment (citizens, enterprises) and within each segment he can choose between “European Union” and “Country Specific”.
- The French portal, http://www.service-public.fr, which is centred around user needs, is divided into pages for “particuliers” (private citizens) and “professionnels” (corporate citizens). The Irish portal, http://www.oasis.gov.ie, follows a similar approach: the homepage provides links to OASIS for citizens and BASIS for businesses.
- The portal site of the Netherlands, http://www.overheid.nl, is divided into pages for “particulieren” (private citizens), “ondernemers en organisaties” (corporate citizens and organisations), “politici en ambtenaren” (politicians and civil servants), “jongeren” (youth) and “guests”.
- The Spanish portal, http://www.administracion.es/portadas, divides its user population into “Ciudadano” (citizens), “Empresa” (businesses) and “Organización Pública” (civil servants). The Belgian portal, http://www.belgium.be, follows the same approach.
- Directgov, http://ukonline.direct.gov.uk, the UK’s main conduit for all public services online, is shaped around the needs of different types of user – at the moment only parents, people with disabilities and motorists.

3 A multi-channel architecture

When a user wants to obtain a public service, he approaches the relevant front office by means of the channel he prefers. While he submits his request, the relevant data is entered and stored in the front office system. Subsequently, the service request is processed in the back office, and delivered to the user over the agreed channel.

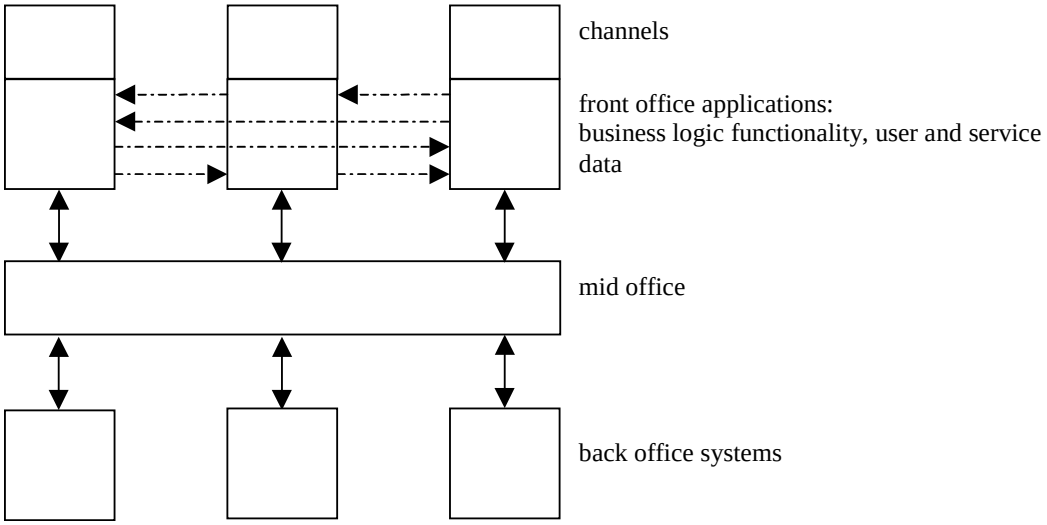
As technology progresses, more and more service delivery channels and devices become available. Because user-centredness is a core tenet in public service delivery, channels should be selected on the basis of the fact that they improve the quality of the services provided to the user. If a variety of channels is to be used, it is crucial to have a model that defines the basis of an integrated channel policy.

A multi-channel architecture (sections 3.2ff) has several advantages over an environment where only multiple channels are implemented (section 3.1), because it facilitates flexible channel-switching, central data storage and re-use of data.

3.1 Multiple-channel service delivery

Separate development of different channels for a single service can lead to inconsistencies such as different data formats or interfaces.

When a service can be delivered by means of more than one channel, the data that is available in one channel must, at some stage, be transferred to the next channel. If the transfer mechanism is part of the channel functionality, flexibility is low.



This kind of service delivery is often called a *multiple*-channel environment. It is an environment in which channels and front office functionality are tightly integrated rather than separate entities, and in which information that becomes known in one channel is not automatically shared with other channels. In order to exchange data, each channel must be connected to each of the other channels.

Multiple-channel service delivery has several drawbacks.

- The channels access different databases and the data they hold may not be consistent.
- The front offices are not aware of other service delivery processes that are taking place or that have taken place with the user, because there is no “central view” of the user.
- Functionality and databases are built separately for each channel. The look-and-feel of the interfaces may be quite different.
- A new front office application must be developed for each new channel that is implemented for a particular service.
- The diversity in front office applications and databases gives rise to a complex ICT structure that is difficult and expensive to manage.

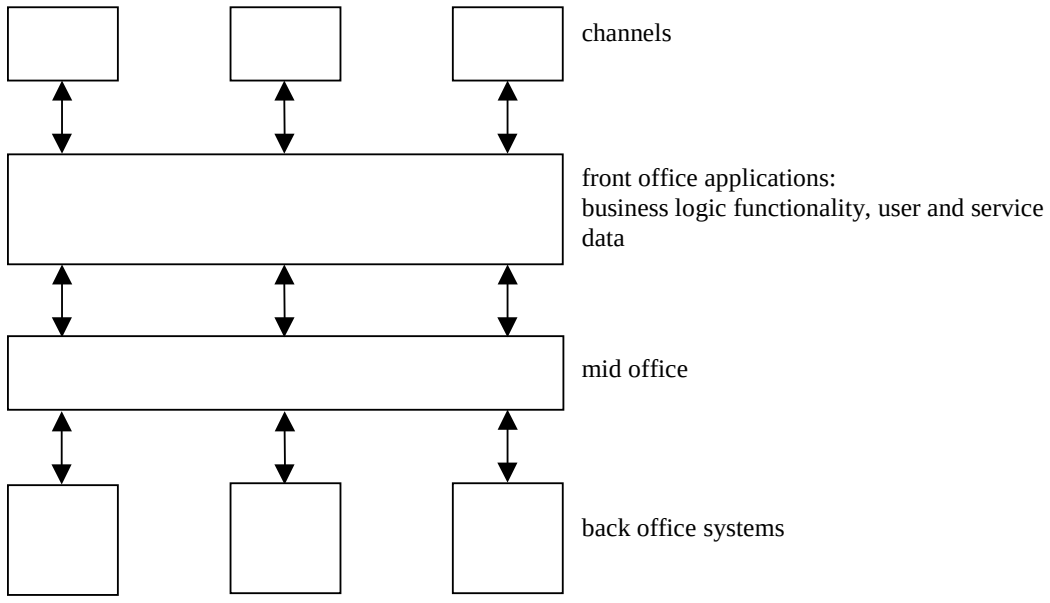
In a multiple-channel environment, channels and the corresponding front office applications can only work together if bilateral transfer mechanisms have been developed.

However, cooperating bilaterally will ultimately result in a complex structure with a high degree of inefficiency and high maintenance costs.

3.2 Multi-channel service delivery

To overcome the drawbacks of multiple-channel service delivery, the different channels should be integrated and coordinated. To enable this, the common data that are used by the front office applications should be stored centrally so that they can be shared by the applications. Storing data centrally means that they need to be collected only once and that they can be accessed by back office applications.

When data is stored centrally, users can also access the services they want from the location(s) they want, as all “contact points” retrieve the relevant data from the same database. Moreover, electronic and mobile service delivery channels enable administrations to offer fully automated services that can be provided on a 24*7 basis.



An issue that has to be addressed not only administratively but also politically, concerns the storing of personal information. Many countries have restrictions with respect to which personal data can be held and how it may be used. These restrictions may slow down the process of back office integration. Another issue that may affect back office integration is that not all databases are interoperable, which may impede the exchange of data..[8]

When only the channels are integrated, there will "merely" be an improvement in service delivery: services will be available over more channels, especially electronic and mobile channels. When back office processes are also integrated, *full service integration* becomes possible, which raises the quality and number of services significantly (section 2.3).

A multi-channel approach enables users to access a service, irrespective of the channel they prefer to use. Front office applications are integrated and support the service provision with centrally stored and accessible data. This ensures that available data are identical in all channels and processes, thus eliminating the need for complex protocols to keep these data attuned.

The main feature of complex, multi-channel service delivery processes is that they involve multiple sessions and that next steps can be taken up by *any* available channel that has access to the central data repository. When the interaction in the service delivery process is resumed, the status, progress and content data is retrieved into the front office application.

Simple service delivery processes may involve only one contact session to complete the entire service. At first sight there seems to be no need to keep centrally stored data on these simple processes. Moreover, they are likely to take place anonymously. However, the following example illustrates that it still may be useful (in terms of user-centredness) to implement them in a multi-channel environment.

> A user has unsuccessfully tried to access an information service over the internet. The next time he tries, he gets in touch with a support employee in a call centre. If the employee knew the steps the user had already taken, he can avoid making unnecessary suggestions.

A multi-channel approach allows users to access services over different channels while ensuring that information is available in all relevant channels.

If channels and back office processes are integrated, different channels can complement each other, thus improving the quality level of services and service delivery.

3.3 Sessions and switch points

A simple service such as consulting a website in order to find information is provided during a single session. However, the end-to-end process of many services requires multiple sessions, and in the course of the service provision, different channels may be used.

The coordination that is required when a service is broken up into different sessions or provided over several channels is ensured by means of "switch points". These points allow a process to be interrupted, to be resumed at some other time and/or over another channel and/or at some other location.

[8] For relevant details on interoperability, please refer to documents such as the European and national interoperability frameworks.

Switch points divide service processes in distinctive process steps. At the end of each step the content, progress and status data are stored centrally. This ensures that only the most recent data are used no matter when, where or over which channel the next process step is carried out.

Services are usually delivered in one or more sessions. To guarantee that the various sessions of a service delivery process can be performed over different channels, at different locations and/or with time intervals, switch points are used to mark and regulate the distinctive process steps.

3.4 Phases in a contact session

Each service delivery process is executed during one or more contact sessions. A contact session consists of three phases: opening the session, addressing the core business, and closing the session.

Because more than one service delivery process may be addressed during a single contact session, it is important that the opening and closing phases need to be executed only once (e.g., by providing a single sign-on procedure).

Opening a contact session

After the contact between the user and the administration has been established, the administration's front office assesses the general reason for the contact. If the user wants a service he can obtain anonymously, he is referred to the area where he can access it. Otherwise he is asked to identify himself.

After the user has identified himself, the front office retrieves the user's central view (the presentation of this view being adapted to the channel's interface). The user indicates whether he wants to resume one of his current service delivery processes ("issues") or whether he wants to start a new process, i.e. the user's needs are determined.

Core business

The core business is the process or process step that the user has chosen in the opening phase.[9] When a switch point is reached, the relevant new data is stored. The following possibilities present themselves:

- the service delivery process has come to an end (the last switch point has been reached): the service has been delivered;
- the service delivery process may be interrupted, to be resumed at some other time and/or over some other channel and/or at some other location;
- the service delivery process may be continued without delay.

When the service delivery process is not continued, the user "is asked if he would like anything else", i.e. he is given the possibility to resume another of his current service delivery processes ("issues") or to start a new one. If, at this time, he does want another service, the contact session is not closed: it continues over the same channel.

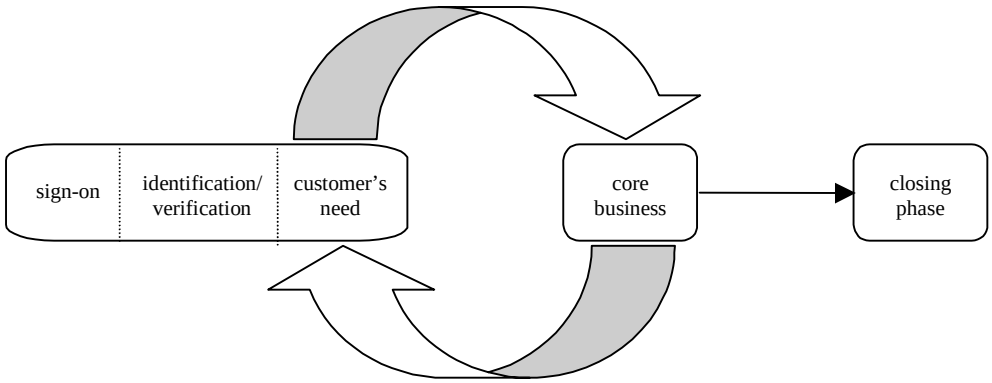
Closing a contact session

If the user does not want anything else, the contact session can be closed. Relevant data and processing orders are transferred to the back office and the user's personal data is updated.

[9] Depending on the particular process or process step additional identification may be needed during the core business phase.

A contact session between an administration and a user consists of three phases:

- opening phase
- core business phase: during this phase one or more service delivery processes may be addressed.
- closing phase



3.5 A re-use strategy

It is obvious that an important consideration in arranging service processes is costs, not just in financial terms, but also from the organisational and technological perspective. Open and flexible architectures composed of relatively small "modules" are helpful in keeping costs as low as possible. Such architectures may solve interoperability problems between applications within an administration, but also between administrations.

A general re-use strategy ("build/record once, apply/use many times") enables individual modules to be made available for re-use and for processing into a wide variety of output. Additional advantages occur in updating and customising.

Re-use must lead to an enhancement of the quality level of services and to cost benefits for the service provider, and ultimately for the user. In implementing such a strategy, due consideration must be given to personnel management. Re-use, re-organisation, back office integration, etc. will undoubtedly have an effect on the administration's employees, some even losing their jobs, others given different tasks. It is only natural that resistance, if not properly addressed, will slow down or obstruct the change process.

Data re-use

In a true multi-channel environment users can address a single service no matter the channel they prefer to use. This implies that the user's personal data and the data concerning status and progress of his "current affairs" (services that are in the middle of their delivery process) need to be available, and identical, in all channels. The use of a central repository eliminates the need for complex protocols to keep data in different channel applications attuned.

Process (step) re-use

When an administration clusters its service processes and process steps, it will become clear that a large number of processes and process steps are basically the same, only with different data. Using parametrisation techniques reduces seemingly different processes to a single process step, e.g. "applying for a form". When the user asks for a specific form, the form with the correct questions is assembled and presented to the user.

Application re-use

Effective application management makes it possible to differentiate the application from the channel device, and hence the presentation from the information. This enables the same application (process step) to be executed independently from a channel device, browser or user segment. It also makes it possible to introduce new channel devices without developing entirely new applications.

Re-use of “modules” (e.g. user data, process steps and applications) will reduce costs, because fewer components need to be developed, maintained and managed, which will ultimately lead to cheaper services for the user. Cooperation in the development of modules within and between administrations will achieve economies of scale, which also leads to lower total costs.

An additional advantage of re-use is “branding”. In his service consumption the user will experience each channel as a single administration and each service as coming from a single administration. This, in turn, will enhance trust.

4 Channels to access public services

Users and administrations need *channels* to interact with one another. A general definition of the term channel reads:

> A channel is a means for users to contact public administrations (inbound) or for public administrations to contact their users (outbound) with the aim of acquiring or delivering public services. This includes the use of web-based technologies, telephony, paper media or face-to-face contacts; applications of these technologies such as the internet, e-mail, SMS, call centres or the counter; and devices to access the applications such as a personal computer, mobile phone, kiosk or digital TV.

A closer look at the term “channel” and an examination of relevant documents reveals that the exact meaning of the term “channel” (or “access channel”) cannot be sharply delineated. The term is often used as an overarching concept that includes “channel type”, “technology”, “platform”, “media”, “device” and “touch point”, although none of these terms are used consistently.

What is more important than the exact meaning of the term “channel” is the user’s or the administration’s perspective on how services are delivered. For example, when an administration with two access channels (counter and telephone) opens a call centre that can be reached by telephone, the user may not notice any difference in the service provision: he still uses the telephone as his access channel to the administration. To the administration, however, the call centre may be a significant cost saver and as such it is a different means of communication than the traditional telephone answered by one of its office staff members.

In this document, the term “channel” covers any means (combination of technologies, applications and devices) used in the interaction between user and administration. An important aspect is the fact that a user’s perception of a channel is not restricted to technical entities. Instead, his evaluation and choice will be influenced by a combination of technical aspects, the way the channel has been implemented and the way it is operated.

For example, if a user calls an administration over the telephone and his call is answered by the employee who can handle his service request, the contact is very direct (and the service may be quite complex). If the same call is answered by an answering machine, the contact is much less direct (and the service cannot be very complex). If the e-mail channel is organised around manual response, it is not much faster than regular mail. If it is used to offer a subscription service to an e-mail newsletter, registration may be handled automatically and the user may receive an immediate response to his subscription request.

Due to the fact that channel features are usually not “technically neutral” it is not possible to provide a general table. An administration that wishes to implement a multi-channel approach will have to prepare a table based on its own situation. Channels may even figure in different versions (e.g., telephone answered by an employee and telephone answered by an answering machine).

4.1 List of channels

The following list of channels is sorted in alphabetical order.[10]

Call centre	• can handle voice contacts (e.g., telephone), internet contacts (e.g., chat, e-mail), written contacts (e.g., faxes, regular mail) • can deliver services ranging from simple general information requests (e.g., self-service through Interactive Voice Response systems (IVR) to complex transaction services (e.g., in direct contact with a human agent) • the use of Computer Telephony Integration (CTI) enables it to be a one-stop-shop • cheaper to operate than traditional channels • can be used as an add-on channel for other channels
Counter	• provides direct and personal contact • suitable for complex services that cannot be provided over self-service channels • expensive to operate • physical distance and limited opening hours may be a barrier
E-mail	• if organised around automated response: > suitable for simple services that don't require personal contact > available on a 24*7 basis • if organised around manual response: > suitable for complex information and communication services that require personal contact > less formal than regular mail > expensive to operate • devices needed to access • visually impaired persons may be assisted by automated attendants • spam may discredit the channel
Instant messaging	• suitable for asking brief questions and for obtaining a prompt answer • faster than e-mail • danger of misunderstanding due to brevity of messages • spim may discredit the channel
Interactive Digital TV	• high potential for including until now excluded social groups • seen by many users as an entertainment device • no single technical standard yet • low penetration rate

[10] Figures concerning use of these and other channels can be found in e.g. Databank Consulting (14-37), eMarketer, the European Information Technology Observatory 2004 (pp. 197-209) and Flash Eurobarometer 135. For a recent report on the American situation consult Horrigan, 2004.

Interactive Voice Response systems	• accessed over a phone line • suitable for simple services • available on a 24*7 basis • seen by many as user-unfriendly (phones with visual readouts may remedy this)
Mobile devices	• enable users to access services irrespective of location • offer functions such as SMS, e-mail, access to the internet (depending on the model), in addition to telephony • raise inclusion in areas with poorly established fixed telephone line system by offering telephone, SMS and internet (m-services) • size of screen is a limiting factor to providing services • functionality of different devices is converging (e.g., PDAs and mobile phones)
Personal computers	• widely used device to access the internet (at home, at work, at school, from public access points) • internet connection needed: modem over standard telephone line, ISDN line or ADSL connection
Public Internet Access Points (PIAP)	• intended for users who have no access to the internet at home • usually located in public places with dedicated staff available to assist users • physical distance may be a barrier
SMS	• offered by the GSM network • send short (max. 160 characters) messages to and from mobile phones • suitable for notification services • can be combined with other channels (websites, e-mail boxes) • technology becoming available that allows messages to be sent via the fixed line telephone system
Telephone	• very high penetration rate • type of services, “opening hours” and costs dependent on the receiving end of the line (an administration’s employee, a call centre agent, an IVR system or an answering machine) • preferred by many users (instead of e-channels) • speech or auditory impaired may be assisted by text phones and communication assistants • may be used to access websites[11]

[11] For example, the UK Department for Culture, Media and Sport has made its website “available to people who do not have Internet access, are blind or partially sighted, or simply prefer accessing information by telephone”. See eGovernment News, 13 May 2004 (http://europa.eu.int/ISPO/ida/jsps/index.jsp?fuseAction=showDocument&documentID=2543&parent=chapter&preChapterID=0-140-194).

Websites	• can contain very large volumes of information • suitable for services that are not too complex • available on a 24*7 basis • devices needed to access (overall internet penetration rate in EU still not exceeding 50%) • parallel or add-on channels such as a call centre can make websites appear more direct: a call centre agent guides the user through his web session • accessing device (PC, mobile phone) determines viewing and thus services (e-services vs m-services) • phishing[12] may discredit the channel

[12] Phishing is a kind of attack using 'spoofed' e-mails and fraudulent websites designed to fool recipients into divulging personal financial data such as credit card numbers, account usernames and passwords, social security numbers, etc. By hijacking the trusted brands of well-known banks, online retailers and credit card companies, phishers are able to convince recipients to respond to them.

5 Channel Selection Framework

Services can be delivered through a wide variety of channels. As the previous chapters have demonstrated, certain channels are more suitable than others for meeting particular user requirements. Moreover, factors such as cost and management make it impractical for an organisation to implement all channels. In addition, too much choice is not always appreciated by the user.

A realistic set of channels must, therefore, be selected from the available range of potential channels. Because success in service delivery depends on a vast range of parameters, there is no single formula or solution that fits all situations. Neither is there a standard table that relates features of channels to particular requirements. Instead, each administration wishing to implement a multi-channel strategy must make its own investigations and choices.

Because there is no single solution, each section of this chapter consists of two types of information:
- considerations that need to be taken into account when making choices, and
- practical steps that need to be taken.

The steps are shown in grey boxes and can be summarised as follows:

1 Rate the features of the available channels.
2 Rate the service provision requirements for each service type.
3 Match the channel features and the service provision requirements.
4 Investigate the channel preferences of potential users and use the results to fine-tune the selection of channels that meets the general user requirements.
5 Determine whether the remaining channels are technically and organisationally appropriate to deliver the services.
6 Determine which channels will realise the best public value, based on (expected) costs and benefits.

The tables provided in this chapter should not be considered as complete lists of channels or services. Although the line of reasoning in the steps and the tables may appear quite strict, channel selection is not meant to be treated as a purely mathematical exercise. The tables merely serve as examples and can be customised to fit an administration’s specific situation, services or channels. Moreover, particular priorities may be included as weighting factors, and these priorities depend entirely on the administration’s objectives and preferences.

It should be kept in mind that the suitability and usefulness of channels depends on a range of factors, out of which technology is only one element. To realise their potential value, channels also need to be properly implemented and operated.

In addition, true user-centric service delivery requires more than the integration of multiple channels. It also calls for increased coordination across administrations, and possibly jurisdictions. This requires new competencies from front office employees who interact directly with their users. The Treasury Board of Canada sums up these competencies as follows: client orientation, cognitive capacity, personal accountability, communication, interpersonal relations, ethics and values, partnering, and teamwork and collaboration.

5.1 Channel features

Channel features can be classified as follows:

- directness
- accessibility & inclusion
- speed
- security & privacy
- availability.

Directness

This feature determines whether the interaction between the user and the administration can take place synchronously (direct interaction as occurs in face-to-face or telephone contacts) or asynchronously (indirect interaction as occurs in an exchange of letters, e-mail, SMS or through an intermediary).

A direct channel is required or preferred if a user has strong feelings about an interaction. In less urgent situations more indirect channels may be considered.

Complex services are more likely to be requested over direct channels.

The degree of directness may be influenced by the way the channel is implemented and operated. When an e-mail channel is implemented in order to provide an automatic answer (and maybe even automatic processing of a service request), it is more direct than when the channel is only used to send letter-like notes.

In other cases a parallel or add-on channel can make a channel appear more direct. For example, when a user needs assistance while he tries to access a service from a website, he can contact a call centre to let a call centre agent guide him through his web session.

Accessibility & Inclusion

This feature determines:

- whether the entire user population or only specific segments of the population have access to the channel, and
- whether the channel can play a role in bridging societal divides and hence increase participation and inclusion.

Accessibility may be measured in terms of physical as well as in psychological distance.

- When services can only be obtained through traditional offline service provision and service delivery points, the distance to the nearest delivery point should not be too long. Multi-storeyed buildings without elevators are not accessible to users in wheel chairs, as are information kiosks in which the position of the terminal is too high for someone who sits in a wheel chair. If the effort outweighs the importance of the service, the service may not be used.

- Even if users have access to certain channels and know how to use them, there may still be reasons for not using them. They may not trust the security of the channel or they may fear that their privacy is not secured. Others may simply resent the channel.

When new channels are added to an existing set of channels, the “social” or “technical” exclusion of certain user segments can be rectified. For example, many users in southern Italy avoided contact with the public sector due to the poor quality of the telephone system and a

slow postal system. The introduction of the mobile phone has made new channels available (telephone, SMS) and an integration/inclusion process based on m-services has begun.

The introduction of interactive digital TV may, in the near future, prove to be a channel that many people who, at present, can only be reached with great difficulty, will use in their contacts with public administrations. At the moment, however, this new channel is primarily adopted by higher income, professional male persons, and can thus not be regarded as a mass channel yet. This means that iDTV cannot, at least at this moment, replace other channels, because this would create a new societal divide.

Speed

This feature determines the time that is required for delivering a service.

A user who needs to act or respond fast will use a channel that instantaneously fulfils his need. Administrations must sometimes provide time-critical information, such as emergency information, (near) real-time.

The way the channel is organised can have a large impact on the fact whether the user will use the channel again, either in relation to a particular service or even in relation to the administration as a whole. When waiting times are consistently exceeded, users will avoid contacting the administration (if they can choose to do so).

Security & Privacy

This feature determines whether the user and the service provider accept a particular channel for specific interactions. Interactions that involve sensitive information or the transfer of money obviously require more stringent security measures than general information services.

Reliable security measures are crucial if new e-channels are to be accepted by the general public. This is not only a technical matter, but also one of perception. If users, or certain segments of the population, do not trust a channel, they will not use it, or they will only use it for less sensitive services.

Awareness creation and/or “compulsion” (imposed by means of pricing policy) may overcome this, provided, of course, the channel is objectively secure.

Availability

This feature refers to the “opening hours” of a channel.

If the channel involves direct contact (e.g., face-to-face or by telephone), the opening hours are usually the same as regular office hours. Channels that do not involve direct contact may have round-the-clock availability, e.g. websites or Interactive Voice Response systems.

In many cases, the availability of a channel as experienced by the user depends on the way it is implemented or the services it is used for. A user can use an e-mail channel 24 hours a day, 7 days a week. However, if his message needs to be handled by an employee, the availability of the channel will be perceived as lower compared to a channel that can automatically handle and respond to the message (round-the-clock).

Step 1, Rate the features of the available channels

Use the following table to score each of the channels listed in terms of high, medium or low on the categories directness, accessibility & inclusion, speed, security & privacy and availability.

Please note that the scores high, medium and low are mere examples in the context of this document. Numerical scores are equally valid, as long as the assessment is carried out consistently.

Channel	**directness**			**accessibility & inclusion**			**speed**			**security & privacy**			**availability**		
	high	medium	low	high	medium	low	high	medium	low	high	medium	low	high	medium	low
Counter	✓			✓				✓		✓					✓
Mail			✓	✓					✓		✓				✓
Telephone •employee	✓			✓			✓				✓				✓
•answering machine			✓	✓			✓				✓		✓		
Website •alternative 1			✓		✓		✓				✓		✓		
iDTV		✓				✓	✓				✓		✓		
etc.															

5.2 Service provision requirements

Whereas the general user requirements as described in section 2.1 focused on the entire service, this section deals with the way in which the service is provided or received, seen from the perspective of the user.

Naturally, considerations involved in selecting the right channel should be seen in the context of the general user requirements. However, to be able to match the user requirements with the channel features, the various requirements for providing the service are classified in the same way as the channel features.

Directness
This requirement determines whether the user wants an immediate response to his service request or not.

Accessibility & Inclusion
This requirement determines whether the user must have access to the service over at least one channel.

Speed
This requirement refers to the speed of the service delivery that the user wants in a particular situation.

Security & Privacy
This requirement determines whether the requested service involves sensitive information that should not become known to others.

Availability
This requirement determines when the user wants to access the service: e.g., anytime or only during office hours.

Step 2, Rate the service provision requirements of each service type

Use the following table to score each of the service types in terms of high, medium or low on the categories directness, accessibility & inclusion, speed, security & privacy and availability.

Ratings are assigned in terms of the minimum level that is required for a particular service type. For example, when a user is satisfied with a channel with a low availability, it is assumed that he will also accept a medium or high level of availability.

Please note that the scores high, medium and low are mere examples in the context of this document. Numerical scores are equally valid, as long as the assessment is carried out consistently.

The requirements should reflect different user segments and situations, for example "normal conditions" vs "urgent conditions" or different age groups. A different or unique service requirement should be entered as a separate line in the table.

Service	**directness**			**accessibility & inclusion**			**speed**			**security & privacy**			**availability**		
	high	medium	low	high	medium	low	high	medium	low	high	medium	low	high	medium	low
apply for a passport															
•normal conditions			✓	✓				✓			✓				✓
•urgent conditions	✓			✓			✓				✓		✓		
receive new passport															
•normal conditions	✓			✓				✓		✓					✓
•urgent conditions	✓			✓			✓			✓			✓		
etc.															

5.3 Channel features and service provision requirements

During the previous two steps, the channel features and the service provision requirements were classified. The current step consists of matching the outcome of these two steps.

Once this match has been made, a preliminary selection of channels becomes apparent: Please note that this is the selection from the user's point of view; provider conditions have not been taken into account yet (this occurs in steps 5 and 6).

Step 3, Match the channel features and the service provision requirements

Use the following table to make a preliminary selection of the channels that are likely to be accepted by users.

In making the match between channel features and service provision requirements, the contents of the table shown in step 1 is combined with the contents of the table shown in step 2.

service	directness	accessibility & inclusion	speed	security & privacy	availability
apply for a passport					
•normal conditions	all	counter, mail, telephone	all but mail	all	all
•urgent conditions	counter, telephone	counter, mail, telephone	telephone, web, iDTV	all	web, iDTV
receive new passport					
•normal conditions	counter, telephone	counter, mail, telephone	all but mail	counter	all
•urgent conditions	counter, telephone	counter, mail, telephone	telephone, web, iDTV	counter	web, iDTV

- Please note that the telephone channel has been entered as a possible channel for receiving a passport, taking into account the future possibility of an SMS message that could serve as valid ID. However, current legislative requirements, which are taken into account during step 5, reduce this channel to a mere theoretical possibility.

- For the service "apply for a passport", the counter and telephone channels satisfy all service provision requirements for users whose application can be dealt with in a normal timeframe. An additional channel is mail (it satisfies 4 out of 5 requirements).
- For the service "apply for a passport", there is no single channel that satisfies *all* service provision requirements for users whose application requires special treatment, for example because the user needs his passport urgently. Acceptable channels are telephone (satisfies 4 out of 5 requirements), counter, web and iDTV (3 out of 5).
- For the service "receive new passport", the counter channel satisfies all service provision requirements for users whose application can be dealt with in a normal timeframe. An additional channel is telephone (satisfying 4 out of 5 requirements).
- For the service "receive new passport", there is no single channel that satisfies *all* service provision requirements for user whose application requires special treatment, for example because the user needs his passport urgently. Acceptable channels are counter and telephone (satisfying 3 out of 5 requirements).

5.4 Channel preferences[13]

The introduction and implementation of new channels means that users have more choice in how to interact with public administrations. On the one hand, this makes life easier, because now there are more ways to contact the administration: over more channels, from more places and at more times.

[13] Information on channel preferences can be found in e.g. Databank Consulting (2003): pp. 38-45, Dialogic (2001): pp. 12-24, Klootwijk & Maatje (2001), R.A. Malatest & Associates Ltd. (Canadian situation) and Sharpe (2000).

On the other hand, life may become more complicated, as more choices/decisions have to be made and questions answered. What channels in what circumstances are available? Do all channels provide the user with the same quality services? What are the costs? What is the address of the office building or website? What abilities are needed to navigate? What are the security measures?

Users must be able to identify the channels that are open to them, and be able to assess their value. And for all available channels the relevant information (such as contact points, opening hours, ways to identify) must be accessible.

Channels should give users more choice, but it should be realised that in some cases users might be better off with limited rather than with unconstrained choices.

The range of possible channels that is the result of step 3 can be narrowed down when users' channel preferences are taken into account.

Channel preferences should be analysed in relation to experience. Users may express a preference for a particular channel, but only after that channel has become available to them and after they have used it, can their real attitude to it be determined.

Before users can express their real preference for a certain channel, they have to be aware that the channel is available and they have to accept it as a good alternative for other channels (e.g., induced by faster service delivery or by means of a pricing policy).

Pilot projects must determine whether new channels will be accepted by the user community. Users' channel preferences, both for already implemented and new channels, should be constantly monitored.

Each administration "should find out the preferences of their user segments in relation to the services and the types of transactions required."[14] The smaller or the more uniform an administration's sphere of activity, the less channel preferences will vary.

Bearing in mind differences between individual users, preferences vary considerably depending on:

- demographic and socio-economic factors, such as gender, location (urban or rural based, region) and health

- phase in the service delivery[15]
  Every service delivery process can be characterised as a service cycle that consists of various generic phases, like general information, consultation and service provision. Research has shown that the channel over which users seek information, is often also the channel they prefer in the following service steps. But, the more complicated an interaction with an administration, the less the user wants to do it over indirect channels like the internet. In that case, telephones remain the overwhelming favourite way to communicate.

  Users who have a preference for personal contact when seeking general information, are not usually inclined to use the telephone or the internet in the following process steps.

[14] UK's Channel framework: p. 16.

[15] For this section see for example Klootwijk & Maatje (2001): pp. 45ff and R.A. Malatest & Associates Ltd. (2002): pp. 13ff.

Users who use the telephone to obtain information, are more inclined to switch to the internet channel; a possible explanation for this may be that they are less afraid of non-visual contact.

- type of service
  The type of service may change the overall picture of channel preferences. For example, although overall the percentage of women using the internet is lower than the percentage for men, in both the EU and US females are more likely to use the internet to search for health-related information.[16]

Step 4, Investigate the channel preferences of potential users and use the results to fine-tune the selection of channels that meet the general user requirements

Investigate channel preferences of the potential users. To do so, use available observations from the practice of service provision, available best practice cases or literature on channel preferences.

The investigation should give an indication of channels that are likely to be favoured or alternatively, not to be accepted by the target group of a particular service or provider.

Especially the indications of the channels that are likely not to be accepted should be taken into account. These channels should be deleted from the list of channels that resulted from step 3.

5.5 Provider requirements

Once the potential channels have been identified from the users' perspective, they must be assessed in terms of the conditions imposed by the provider, i.e.:

- technical suitability,
- organisational suitability.

Technical suitability

The channels that are used to provide a particular service must be suitable to do so from a technical perspective. For example, it is obvious that physical parcels can only be delivered to the user over the counter, by mail, or by way of some intermediary. Services that involve large amounts of information or complicated application forms require a different channel than services that only contain short notifications. E.g., it is more complex to download forms via a digital television set or mobile phone than via a PC.

If a channel does not live up to the provider's expectations, the administration must carefully analyse the reasons:

- Is the channel technically or physically suited for the services?
- Was the channel properly implemented and is it operated well: is it secure, is there enough support, is it usable, etc?
- Do users have a general dislike for the channel?

[16] Work Research Centre (2003): p. 27.

Administrations should have an open, non-biased mind in analysing the technical suitability of channels. If a channel is inherently inappropriate to deliver the intended services, it may be wiser not to implement the channel at all.

Organisational suitability

This condition refers to the fact that in some cases the use of a particular channel may be mandated by organisational, administrative or legal rules. E.g., a passport may only be picked up at the counter.

If, before a service can be delivered, a user must identify himself in the presence of an administration's employee or a trusted third party, that service can only be delivered over the channel where the identification takes place.

The way an administration has defined its service delivery processes (process steps, switch points) also influences the deployment of channels. For example, if the process for application and delivery of a passport is not regulated by law apart from the fact that the finished product must be picked up at the counter, administrations can make their own choices in setting up their processes. One administration may arrange the entire process in one process step, which then must take place over the counter, whilst another administration may divide the process in two steps, and allow the application step to take place over any available channel.

Step 5, Determine whether the remaining channels are technically and organisationally appropriate to deliver the services

Use the following table to assess the potential channels (after user requirements and preferences have been analysed, i.e. the result of steps 1, 2, 3 and 4) in terms of the provider conditions.

Please note that the scores used for technical suitability (high, medium, low and zero) and the scores for organisational suitability (yes or no) are mere examples in the context of this document. Numerical scores are equally valid, as long as the assessment is carried out consistently.

service	potential channels after user analysis	technical suitability				organisational suitability	
		high	medium	low	zero	yes	no
apply for a passport							
•normal conditions							
	counter	✓				✓	
	telephone	✓					✓
	mail	✓				✓	
•urgent conditions							
	telephone	✓					✓
	counter	✓				✓	
	web	✓				✓	
	iDTV		✓				✓
receive new passport							
•normal conditions							
	counter	✓				✓	
	telephone				✓		✓
	mail	✓					✓
•urgent conditions							
	counter	✓				✓	
	telephone				✓		✓
	home delivery service	✓					✓

- Users who want to apply for a passport and whose application can be dealt with in a normal timeframe can be served by means of the counter and mail channels. The telephone channel cannot be offered for this service, as this is organisationally not allowed.
- Users who want to apply for a passport and whose application requires urgent treatment can be served by means of the counter and web channels. The telephone and iDTV channels cannot be offered, as these are organisationally not allowed.
- Users who want to receive their new passport and whose application can be dealt with in a normal timeframe can only be served by means of the counter channel. The telephone channel is neither technically possible nor organisationally allowed, the mail channel is organisationally not allowed.
- Users who want to receive their new passport and whose application requires urgent treatment can only be served by means of the counter channel. The telephone channel is neither technically possible nor organisationally allowed, the home delivery service channel is organisationally not allowed.

5.6 Cost and benefit considerations

5.6.1 Considerations to be taken into account

Resources are not unlimited and must be used responsibly. This means that a sound financial rationale is required for the introduction of new channels (or possibly the retention of old channels), in which costs and benefits must be balanced against each other.

Determining costs and especially benefits is not a strictly financial matter. In contrast to private sector companies, public administrations need to take into account “public value”. Financial benefits to the administration may not always be the primary consideration. It is of the utmost importance that an administration has a clear view of the results it wants to achieve when it

introduces a new channel: if not, realised results cannot be compared to intended results, and decisions may be made on the wrong grounds.

Moreover, public administrations are often faced by the fact that they *must* provide certain services, and that they must do so over certain channels, even if other channels are strongly preferred by users or could yield considerable cost savings.

The assessment of costs and benefits will have to focus on both tangible and intangible factors. How do the costs contribute to improved service delivery (user requirements), increased efficiency and effectiveness (provider requirements) and wider political objectives (greater participation, economic development, etc.)?

There is no single measurement method that applies equally well for all administrations. The metrics to be used should be determined by a strategic management decision. However, whatever metrics are chosen, calculations should be based on realistic assumptions, past experiences and good practice cases.

Costs should be measured in money and time, and should be calculated for developing, implementing and operating a channel.

The evaluation of benefits depends on the importance assigned to the user and provider requirements and to the wider political objectives for introducing the new channel.

For example, delivery of services via modern e-channels is often much cheaper than delivery via traditional channels. The costs of an offline service transaction can be up to 30 times as high as a web-based self-service transaction.[17]

To realise lower costs associated with these modern channels, administrations may need to introduce policy measures (e.g., a pricing policy that focuses on inducing users to use cheaper channels and closing more expensive channels). Lower delivery costs for administrations ultimately mean lower costs for users.

However, whatever method is used to stimulate users to select cheaper channels instead of more expensive channels may have negative effects for some users (e.g., when a service is not available anymore because the user does not have access to the remaining channels). This in turn may create a new societal divide. Because not all users can afford cheap channels, e.g. because they don't own computers with fast internet access, administrations should support free or low cost public access terminals that are within reach of all users.

Moreover, there are indications that the acceptance of channels is negatively affected if the "convenience fee" (to pay for online processing) is felt to be too high.

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[17] Although different studies cite vastly varying figures, they all point to the same trend. See e.g. Martin Stam & Paul van Ladesteijn: Kostenverlaging en performance verbetering (http://www.tote-m.com/images/content/ebalie/artikelen/Hogeschool%20InHolland%20Gastcollege.pdf): sheet 22. Or Chris Hall: Declaration of Customer Service. Web-based interactions is the future for the public sector (DestinationCRM, June 16, 2003; http://www.destinationcrm.com/articles/default.asp?ArticleID=3214): "... industry-accepted estimates show that the cost of an offline service transaction can be anywhere from $15 to $25 per transaction. Online transactions at the high end average $2, and Web-based self-service costs pennies per transaction."

By introducing and promoting new, cheaper channels to deliver a service in an effort to save costs on more expensive, traditional channels, the service becomes more visible and its take-up will grow. This is precisely one of the reasons to introduce additional channels. However, practice shows that the growth in service take-up is often distributed over all available channels, i.e., including the more expensive channels, thus raising total costs for the administration.[18]

Step 6, Determine which channels will realise the best public value, based on (expected) costs and benefits

Investigate the remaining channels (see step 5) in terms of public value by considering the balance between the expected benefits and the costs to be incurred in offering the channel.

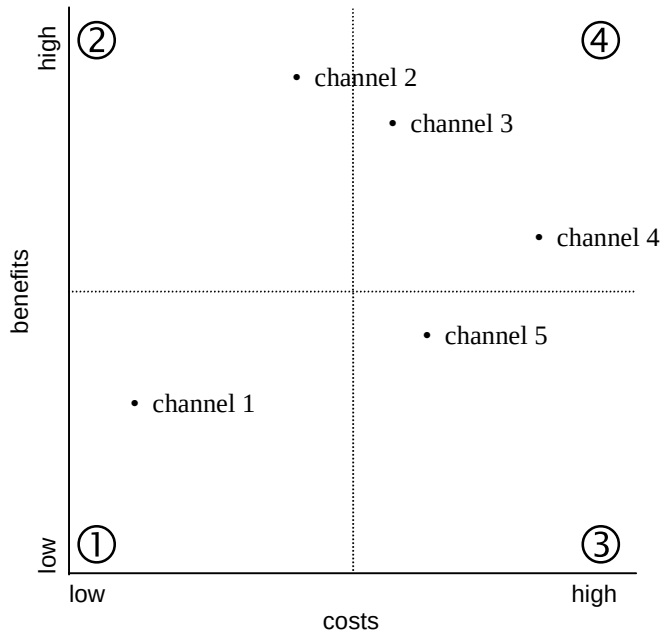
To do so, use some of the observations as described above, available observations from the practice of service provision, or available best practice cases or literature on cost aspects of public services.

5.6.2 Final channel selection

Once the steps as described above have been taken and all relevant information has been gathered, the final channel selection can take place.

Please note that the analysis of steps A1 and A2 should be carried out for each service. Subsequently, the results of these steps are collated in the table presented in step B. The ranking of scores in this table can be used to arrive at the final selection of channels to be offered.

A1 Position the remaining channels in the quadrants of the following figure. Of course, a more intricate division may be considered.



[18] If the introduction of a new channel redirects service consumption from another channel and if that channel cannot be closed down (e.g., because certain user groups might then be excluded from the service), the relative costs of operating the channel go up.

A2 Assign a weighting factor to each quadrant. This factor must reflect the importance of realising the benefits (costs as a function of benefits) or the importance of keeping costs low (benefits as a function of costs). For example:

Quadrant 1 (weighting factor: 2)
Both costs and benefits are relatively low. The channel may be implemented if unlimited resources are available.
Quadrant 2 (weighting factor: 5)
Costs are relatively low, benefits are relatively high. It is very advantageous to implement the channel.
Quadrant 3 (weighting factor: 1)
Costs are relatively high, benefits are relatively low. From a purely business point of view, it is not appropriate to implement the channel.
Quadrant 4 (weighting factor: 3)
Both costs and benefits are relatively high. It seems advantageous to implement the channel, but a number of points need clarification. A business case is advised.

B Set up a table with the rows representing the channels, the columns representing the services and the cells showing the weighting factors. For example:

Service / Channel	apply for a passport: • normal conditions	apply for a passport: • urgent conditions	receive new passport: • normal conditions	receive new passport: • urgent conditions	apply for allowance	receive government documentation	pay for licence	etc.
counter	2	3	5	5	2	2	3	
telephone	-	-	-	-	5	-	5	
mail	3	-	-	-	3	2	1	
web	-	5	-	-	5	5	-	
iDTV	-	-	-	-	5	2	-	
home delivery service	-	-	-	-	-	3	-	
etc.								

The rows indicate the services for which a particular channel may be relevant. The columns indicate which channels may be relevant for a particular service.

Please note that some channels may have a low score because they are “outdated” (few users are *still* using it) and that others may have a low score because they are “futuristic” (few users are *already* using it).

6 Implementation guidelines

This chapter describes the steps involved in implementing a multi-channel strategy.

Because success in service delivery depends on a vast range of parameters that cover the service itself, the means employed to deliver the service, the requirements of the user community and the objectives of the organisation providing the service, the first phase of a multi-channel strategy consists of investigating these parameters.

Once the implementation phase has been completed, solutions are likely to require fine-tuning or more far-reaching changes. This is why the post-implementation phase must include usage monitoring and customer satisfaction assessment. The information obtained in this manner must be used as input for decisions with respect to changes and further improvement of the implemented solutions.

6.1 Pre-implementation phase

1 Define general objectives, taking into account the priority between user and provider requirements.

2 Decide which services are candidate for multi-channel service provision. Investigate whether the services can be divided into distinct steps, e.g. providing information and responding to inquiries, receiving an application, processing the application, delivering the result.

3 Carry out regional research and segmentation of the customer base to determine the needs and preferences of the various segments of the target group of the service(s).

4 Use the channel selection framework (presented in chapter 5 of this study) to determine the channels to be implemented.

5 Develop a business case and make final decisions on which channels to implement. The business case should at least cover the following issues:
- objectives;
- expected results in terms of targets for a certain period (e.g. 1 and/or 2 years) following implementation;
- investigation and analysis of technical solutions;
- investigation and analysis of organisation changes (business processes and back and front applications, staffing);
- implementation path;
- pricing policies that can influence or change channel usage;
- quantification of all aspects in terms of costs and time (to obtain costs, possibly consult with potential contractors);
- evaluation in the light of budget and investment policy (Return on Investment, Net Present Value, etc).

In short, at the end of this phase you will know:
- your priorities,
- which services you want to provide in a new way,
- what your customers want,
- which channels you will provide,

- how you will influence channel usage,
- what you expect in terms of results and benefits.

6.2 Implementation phase

1	Draw up detailed specifications and possibly develop a prototype. In defining the specifications take into account the possibilities of generic service steps and possible re-use of application components. Use the specifications and the prototype in tender specifications and/or briefing and negotiation with contractors.
2	Obtain the required solution by publishing and awarding a tender or otherwise. Include extensive testing (from the user's perspective) and a pilot phase in the solution development cycle.
3	Carry out awareness creation and promotion to announce the new channel's launch, pointing out benefits to users, etc. Pay attention to web presence (create access from a portal, and include banners and links from other sites). Pay attention to access from search engines. If particular usage patterns need to be changed, do so by means of pricing policies and special promotion activities.
4	Launch the new channel.

In short, at the end of this phase, you have:
- informed your user community of the new ways in which they can acquire services and the associated benefits;
- made sure that the new solution can be found and accessed;
- launched a working solution (that has already been tested).

6.3 Post-implementation phase

1	Perform regular usage monitoring and customer satisfaction assessment. Take special notice of potential exclusion groups.
2	Carry out ongoing promotion to keep drawing users' attention to the new channels and, if required, to decrease the usage of old channels that are to be phased out.
3	Carry out a cost/benefit analysis and assess the outcome in the light of the forecasts made in the business plan.
4	Analyse whether any changes are needed in the implemented solutions, the organisation's business processes or structure or the manner in which the user community is informed.
5	If changes are required, set up an implementation path to realise the changes and determine by means of continued monitoring, assessment and cost/benefit analysis whether the solution is satisfactory or can be optimised.

In short, at the end of this phase, you should know:
- how the new service is taken up by the user community;
- the actual benefits and costs and you have compared these with the expected benefits and costs in your business plan;
- whether you need to make any changes to improve the way in which you meet your objectives.

7 Best Practice Cases

This chapter describes ten European implementations of multi-channel solutions. The first eight case descriptions deal with multi-channel implementations in the public sector.[19] The last two cases were taken from the private sector, and were included because of specific elements that can also be applied in the public sector.

Public sector

- HELP.gv-portal, Austria: General service portal, including provision of certificates of residence by means of a web portal, public access points, hotspots offering free of charge WiFi access, WAP-based handheld devices and mobile phones.

- Crossroadsbank, Belgium: Collection and distribution of social security-related information and calculation of benefits by means of an interactive portal, XML-based messaging and supported by a voice server.

- OJS Publication System, Office for Official Publications of the European Union: Receiving, processing and publishing public tenders. Information is received by means of fax, e-mail and online forms; information is published on the tender Electronic Daily website or on CD.

- m-Government, Malta: Notifications on a variety of government services by means of a website, mobile phones and SMS-messaging.

- My-IB-Group, The Netherlands: Provision of student grants, including data entry, calculation and communication by means of a web portal, e-mail, SMS, telephone and physical channels (mail and in-person).

- Infokiosks, Poland: Public service information by means of information kiosks, public internet access points and website.

- Income Tax, Spain: Web-based services, linked with more traditional channels such as counter and telephone.

- National Health Service (NHS), United Kingdom: Information services for citizens, with emphasis on elderly and disabled persons. Channels include web sites, digital television and 24*7 telephone support.

Private sector

- ABN♦AMRO Bank, the Netherlands: Full range of banking services, provided by means of web portal, mobile channels, SMS messaging, call centre, IVR, ATMs and traditional counter.

- Railway timetable and SMS-tickets, Germany: Website with timetable and booking facilities for PC, PDA and mobile, with the possibility of SMS-messages as proof of ticket.

[19] Some of the information in the cases for Austria, Belgium, the Netherlands and Spain was derived from Jeremy Millard et al. (2004).

7.1 Austria: HELP.gv-portal

Type of service	**General portal offering services for citizens and businesses, including Certificate of Residence**
Channels/technology	**Web portal accessible via traditional PCs, public access points, WAP-based handheld devices, mobile phones, WiFi access**

Introduction

The Austrian HELP portal (www.help.gv.at) was created in 1997 to offer access to all government services by means of a single gateway. Transparency was ensured thanks to an information structure that is based on life events. Initially, the portal consisted of information services only, but gradually the portal's services were extended to transaction services. The goal for 2005 is that the portal will deliver every administrative service online.

An example of one of the transaction services offered is the Austrian Certificate of Residence (CoR), which was designed as a model application to demonstrate the transaction functionality of the national HELP.gv portal. The Austrian Certificate of Residence is required by institutions such as schools, universities and insurance companies as a proof of permanent residence. A citizen can order the certificate via the HELP.gv-portal. When the service is requested, the user must identify him/herself using a device corresponding to the Austrian model 'Citizen Card' (BÜRGERKARTE). At present this can either be a smartcard with qualified electronic signature or a so-called 'administrative electronic signature' available via mobile phone ('Citizen Card Light'). Subsequently, an online payment procedure is carried out via a private company, and at the end the user can access a certified governmental or private delivery service where he/she can download or get mailed the ordered Certificate of Residence (it is encrypted and only accessible through the user him/herself).

The service has been enabled by a reorganisation of the registration system based on the digitisation of workflows at both national and local levels. A key component was the establishment of a central electronic register of residence in March 2002. Until then, residence information was kept on paper forms and on stand-alone computer systems. Citizens had to request a registration form in person at the office where their information was kept, and the form had to be produced whenever the place of residence had to be verified. Today, interfaces (WebServices, OnLine Access, …) are provided allowing citizens, agencies and private organisations to query information for qualified purposes directly from the centralised registry database. Visits to the registry office are no longer required in person because the new CoR service can be accessed and carried out fully online, at any time and from any place. Online queries of the register of residence are fully operational, but in order to prepare for optimal operation, up to now the full CoR service has been available for testing purposes only.

Channels

In addition to traditional access by means of a PC, the portal site can also be accessed via public access points (information kiosks) and mobile devices (by means of WAP). A special accessibility feature is the widely available free wireless access to all '.gv.at' (government) websites. Anyone with a wireless-enabled notebook can connect to the portal, and soon to any service available under the domain '.gv.at', for free (i.e. without connection fees). This is possible in the vicinity of the 350 hotspots currently available in the country. Most hotspots are located in public places such as cafes, train stations and hotels. It is planned to extend free access to all '.gv.at' websites via public access points (information kiosks) in the near future.

The CoR service offers choice between user identification/authentication via electronic signature on a smartcard and via a mobile phone-based option – both solutions are based on the Austrian model 'Citizen Card' (www.buergerkarte.at). However, the smartcard option has been rarely used, the main reason being the cost involved for the user and the low number of services available that justify the costs of the card. Because of its lower cost and ease of use, the adoption of the alternative, a mobile phone-based option ('Citizen Card Light') promises to become widespread.

The identification/authentication part of the service by means of mobile access is offered by the country's largest mobile phone provider (Mobilkom), thus enabling the exploitation of an already existing and widely used system. The procedure makes use of the fact that the mobile phone provider already identifies the user when a subscription is taken out, so the mobile digital signature can be safely linked to a person's identity. Users of other providers or prepaid phone users who register personally with an identity card are also being integrated into the service. The service also includes a payment solution that allows payment of fees via the mobile phone. This adds to a user-friendly solution with positive effects on the expected service take-up.

Impact

- Implementing the Citizen Card Light option (using the 'administrative signature') demonstrated that user-centric thinking in terms of removing cost barriers and increasing ease of use stimulates demand. Because of the widespread use of mobile phones, most citizens are able to access the services. Good prospects for service take-up are therefore expected. The recent WiFi access-anywhere initiative adds additional momentum to the increase in take-up.

- The service shows that the newly established central register of residence (population register) and other components can work together effectively within an e-government procedure according to the Austrian E-Government strategy and the results of task forces for standardisation of communications architectures and interoperability also within the EU-context (European Interoperability Framework).

- The citizen saves time and does not have to go to his local registry office within limited office hours. The online service is available round-the-clock, independent of office hours and without media breaks. However, the reorganisation of the registration has brought higher costs in some cases. In the old system, every citizen was in possession of a certified document that was free of charge. Today, a certificate of residence is free of charge only in some cases (depending on purpose). Usually it costs € 3. However, occasions on which a certificate has to be produced will become less frequent as more and more institutions access the register directly online. Between June 2003 and May 2004 a total of 421 users have positively completed the online procedure during the testing stage.

- From the point of view of the service provider, the service provides an application that does not require any human intervention. Although no statistics are available yet, considerable cost savings are expected, because costs of a certificate will lie between the costs for digital and conventional delivery or even below the latter.

Aspects of special interest for multi-channel service delivery

- Traditionally, many transaction services were developed as stand-alone services, especially at the local level. The effect was that seamless integration into the portal was not always ensured, especially when services had to interoperate and exchange data.

- Since the CoR service was designed as a transaction that can be carried out fully online (including the download of the CoR via an electronic delivery service), the delivery had to be digitally signed so that no changes of the certificate could take place. To guarantee the legal rules regarding identification/authentication but to avoid the use of the digital signature as the only option, a suitable alternative solution had to be found. This was accomplished by offering a modified version of the digital signature ('administrative signatures') involving a mobile phone provider, which promises a much higher level of acceptance by (potential) users. The mobile phone option differs from the card based in relying on a provider model. Every signing and/or crypto operation takes place on a (bullet-proofed) server of the service provider. To ensure nevertheless highest possible security and to prevent manipulation, the operator of the mobile phone option is subjected to very strict security requirements. From the technical point of view the certificates for the electronic signature used within the processes are of the same technical quality, only the media containing the certificates are either certified devices according to the Austrian signature law or not. The Austrian government has adapted its legal requirements accordingly.

- As long as there are no more than a few services, which are also available offline, citizens will refrain from purchasing equipment to use public e-services. Furthermore, if users have to pay substantial charges for such services, this will impede take-up. Transaction costs for obtaining and mastering hardware and software for public e-services add to the unwillingness to invest time and money. The HELP.gv.at portal and the Certificate of Residence service demonstrate that solutions with lower barriers of entry can make an increasing number of people adopt a new service, thus building a user base for online services.

7.2 Belgium: Crossroads Bank of Social Security

Type of service	**Collection and distribution of information for the social security sector**
Channels	**Interactive web portal, application-to-application mode, file transfer mechanisms and a vocal server**

Introduction

The "Crossroads Bank for Social Security" (CBSS) facilitates data interoperability and exchange between a large number of institutions and their systems. CBSS should be seen as a clearinghouse rather than as a centralised data repository. The responsibilities of CBSS consist of identifying and routing data by managing registers about the location and type/format of data, and for whom and for which purpose these data can be accessed.

The users of the Crossroads Bank are mainly 1.500 social security offices, each of which may have different data systems and formats that are used for the administration of employees' retirement pensions, unemployment, insurance against industrial accidents, insurance against professional diseases, family allowances, illness and incapacity insurance and yearly holidays. Moreover, some data are used by the tax department.

The Crossroads Bank was primarily designed as a tool to remedy the problem of repeated data collection. In the pre-Crossroads Bank situation, each social security institution had its own data requirements and forms, and companies had to invest a large amount of time each month in order to comply with their duties towards the State as well as towards their employees.

The main principle of the new system is its efficient data collection structure: data needs to be entered once only and is then re-used for various purposes. This principle saves a considerable amount of time and results in higher levels of data integrity as well as better coordination between public offices that previously maintained distinct files.

Security was an important aspect in designing the system, because different institutions have access to large amounts of highly sensitive data. Access authorisation is, therefore, granted by a special committee appointed by the Belgian parliament. Each person for whom data is stored in the system is entitled to verify this data. Whenever data is used for making a particular decision, all persons involved are notified of the relevant data transactions and the decisions that were made.

Channels

Employers can transmit the data of their employees from application to application or via on-line transactions on the web portal. They can also consult and correct the data they have transmitted and that are managed by the social security offices, which means that they do not need to keep separate off-line files for these data any longer. If they do require their own files, employers can download data in XML-format. For some services, a vocal server is available. Data exchange between the various systems and applications of the processing institutions takes place by means of XML-based messages.

A special Contact Centre has been set up to deal with employers' questions and complaints regarding problems with the use of the electronic communication methods. This contact centre can be reached 24 hours a day, 7 days a week by phone, fax, mail or by a contact form. The Contact centre uses a CRM system for registering and streamlining its contacts with employers.

Impact

The reorganisation of the service and its delivery by means of several channels led to the following benefits for users.

- Ease of use thanks to personalised services that are based on 'life event' concepts, e.g. start a new job, illness, retirement or unemployment.

- A large number of allowances and benefits are now allocated automatically, without the person in question needing to submit an application at the offices of their local authority. For example for the elderly or the disabled: pensions, free subscriptions for public transport reduced or proof that they are entitled to reduced telephone tariffs.

- Considerable timesavings for employers thanks to the principle of one-off data collection, co-ordinated data storage, declarations by means of direct interaction between employers' systems and those of the government institutions. Hundreds of paper forms that were exchanged between social security offices have been replaced by 170 types of electronic messages. In 2003, 1,500 actors exchanged 339 million electronic messages, with an end-to-end response time of less than 4 seconds in 99.2% of cases. Approximately 50 paper forms that were used for data transmission by the employers became obsolete; some electronic 30 forms had to be retained, but these forms were optimised considerably because the number of fields on the forms could be reduced by 65%.

Aspects of special interest for multi-channel service delivery

- Back-office reorganisation and streamlining of information flows lead to significant timesavings.

- Implementation of the principles of once-only data entry and subsequent re-use have the positive effect of timesavings. However, since personal data are involved, additional attention is required for security aspects such as authorisation for access and type of usage, and notification of the person involved regarding the usage of his data.

7.3 European Union: OJS Publication System, Office for Official Publications

Service	**Receiving, processing and publishing public tenders**
Channels	**Fax, e-mail, online forms, helpdesk, CD, website**

Introduction

The OJS Publication system is used to publish the S series of the Official Journal of the European Union (OJ) each working day in all 20 official languages of the EU. The S series contains all public notices of tenders from the 25 EU countries (as of 01/05/2004) above certain contract values which legally have to be made public according to EU directives and other public regulations. The Journal is published by the Office for Official Publications of the European Communities (Publications Office), the official publishing house of the EU institutions.

The Supplement to the Official Journal publishes approx. 1,000 tenders each day which amount to more than € 500 billions each year. The OJS contains:
- public contracts for works, supplies and services from all EU Member States;
- utilities contracts (water, energy, transport and telecommunications sectors);
- public contracts from EU institutions;
- European Development Fund contracts (ACP countries);
- Phare, Tacis and other contracts from Central and Eastern Europe;
- European Investment Bank, European Central Bank and European Bank for Reconstruction and Development financed projects;
- European Economic Area contracts (Norway, Iceland and Liechtenstein);
- contracts pursuant to the agreement on government procurement (GPA), concluded within the framework of the (GATT)/World Trade Organisation (WTO), from Switzerland;
- notices concerning European Economic Interest Groups (EEIGs);
- public contracts for air services.

Channels

The OJS Publication System can be considered as a workflow system that supports the entire process from receiving notices (mainly in one language) to publishing the notices in 20 languages. In addition to the Publications Office, a number of external parties are involved in the process.

Information is received in unstructured or structured format, in any of the 20 official languages of the European Union. The unstructured format comprises submissions by paper, fax or email. Upon receipt, this information is digitised into PDF image format, and then forwarded to an external company that encodes the information into XML-format. This company also produces

a summary in all official languages of the European Union for notices from EU countries and translates the notices of the EU institutions.

If information is received in structured format, the data is already structured in the required XML format at the time of reception, which, of course, saves a substantial amount of time and resources. Receipt in this form takes place by means of online forms offered on the SIMAP website (http://simap.eu.int), or through external partners (called OJS eSenders) that have been qualified before being allowed to send the notices in the agreed XML format.

SIMAP is the information website that supports public procurement in Europe. The SIMAP helpdesk offers support in case of questions related to submitting the information on tenders, i.e. help in completing forms. Questions of a procedural or legal nature are redirected to DG Internal Market (DG-Markt), one of the Commission's directorates.

Information from the XML files is published in Tenders Electronic Daily (TED – http://ted.publications.eu.int) on the internet or on a CD-ROM, which is available on subscription. In addition, information is made available under subscription in standardised format (currently ISO, XML in the future) to license holders. Both published versions offer extensive searching and browsing facilities.

Until July 1998, a printed edition was also available on a daily basis.

Before information is published, the Publications Office applies extensive quality control measures. Most of the validation takes place by means of automated procedures. However, when errors are indicated, human interference is required to resolve problems. Extensive communication between the partners involved in the various processes (the Publications Office, OJS eSenders, the external company, etc.) ensures early reporting of encountered problems that could not be identified by the automated procedures.

For more information consult http://forum.europa.eu.int/opoce/eproc/home or contact: mailto:esupport.mp-ojs@opoce.cec.eu.int.

Impact

- Submission of information in structured format, by means of online forms (SIMAP or OJS eSenders), means a considerable reduction of the turnaround time between the moment of submission and the time of publication. If information is submitted in unstructured format, the average turnaround time is 12 days. When the online forms are used, the turnaround time is reduced to 5 days.
- Publication in electronic format allows users to perform their own searches and selections.
- License holders can receive an advance XML-version of the tenders (24 hours before the web version is published). This allows them to process this information and serve their "clients" at the same time (09h00) the tenders are published on TED.

Aspects of special interest for multi-channel service delivery

- Usage of electronic channels, in this case the online forms for submission of structured information, leads to a substantial decrease in turnaround time, and thus, to a substantial increase in benefits for both the user and the provider.
- The pan-European scale and number of users of the OJS Publication System mean that any benefits are enjoyed by an enormously large number of users.
- The ease of use of the online forms is actively promoted in order to change the current ratio of 10% of submissions in structured format to approx. 30% before the end of 2004.

- Licensed intermediaries have "special access rights", which enables them to add value to the services they provide to their customers.

7.4 Malta: m-Government

Services offered **Notification on a variety of issues**
Channels **Website, mobile phones, SMS messaging**

Introduction

Malta offers its public e-services via a variety of service delivery channels apart from the world-wide-web. One of these service delivery channels is mobile telephony. Malta's priority treatment of this channel is a natural choice in light of the impressive mobile-ownership (72% of the total population) and SMS usage statistics of Malta's population (some one million messages are sent daily). The success and rapid take-up of this technology has prompted the Government to widen the scope of its eGovernment initiative to include mobile phones for provision of public services.

The initiative of offering government services via mobile phones was started off in June 2002, when a Mobile Government Joint Project Review Board (m-GJPB) was set up under the chairmanship of the sponsor of the e-government initiative, the Ministry for Justice and Local Government, now the Ministry for IT & Investment. The board included representatives from the IT agency for government, MITTS Ltd, the Malta Communications Authority, the Central Information Management Unit and two local mobile operators, Vodafone Malta and Go Mobile.

The first phase of the initiative covered the following services:
- notifications of Direct Credit Advice from the Department of Social Security;
- notifications of trading or permit license renewals to licensees such as shop owners, artisans, restaurateurs, boat owners, etc.;
- notifications of examination results to candidates;
- notifications of court sitting deferrals to lawyers;
- notifications of acknowledgements and status change of user complaints logged on the official Government web-based Customer Care System.

More complex services requiring authentication and two-way interaction between subscriber and government are planned for a subsequent phase.

Channels

As early as 2001 MITTS Ltd had deployed a robust and scalable infrastructure that was capable of sustaining a specific number of e-services. These included the hosting of the government portal (gov.mt) as well as all the various interlinked websites, the government intranet, and the availability of a core software library that could facilitate the interfacing of various back-end systems with web-based applications to create veritable dynamic transaction-based public services on-line. At the outset of the initiative the joint project board decided that the same approach would be taken by hosting the SMS Gateway on the Framework together with other core e-government services such as the payment gateway, links to corporate databases and imminently the registration and authentication system. The technology deployed was to be XML for the transmission of Business-to-Business and Government-to-Business communications.

After agreement was reached on the specifications and design of the SMS Gateway by September 2002, work began in parallel on actual development of the gateway, the

m-government request website (http://mobile.gov.mt) and on the adaptive changes to the various back-end systems. By the end of December 2002 the bulk of the work was complete. After the initial teething problems were ironed out, in particular training of departmental users in administering the m-service, and the various stress tests and end-to-end tests with the mobile operators, the SMS Gateway and the various m-government services went live in April 2003.

Impact

- Just-in-time information: information is communicated immediately after it has become available, as in the case of lawyers or examination applicants.
- Information on Demand: information is sent to the subscriber upon request, as in the case of requests for a bus schedule via SMS.
- When the higher penetration of mobile phones (72%) over the ownership of computers in households (50%) in Malta is taken into account, SMS is seen as a viable medium for the delivery of information, and consequently conducive to a better quality of life for citizens.
- Since SMS is a more cost-effective medium with respect to conventional media such as mail and fixed line telephony, the cost of delivering information is lower.

Aspects of special interest for multi-channel service delivery

- Deployment of mobile phones and SMS-messaging in an area where the penetration of computers in households is lower than that of mobile phones.

7.5 The Netherlands: My-IB-Group

Service **Provision of student loans**
Channels **Web portal, e-mail, SMS messaging, telephone, traditional counter**

Introduction

The Dutch IB-Group is an “independent” agency that is responsible for administering student loans and other student services. Over the past years, the IB-Group has had an extremely negative image and reputation resulting from poor performance. One of the main complaints expressed by customers against the existing system was that their data was often incorrect, for example their address or chosen course of study. Moreover, many complaints were received regarding long waiting times when the service was called by phone. One of the prime reasons for the poor performance of the service was a lack of coordination between back offices and the agencies that acted as interface between the IB-Group and its customers.

The “My-IB-Group” initiative was set up to improve customer services and customer relations, which should lead to improved public perception of the IB-group. The demand from users for a properly functioning service was met by delegating many data input and query tasks and responsibilities to the user. Moreover, the number of access channels was extended to include a web-portal, e-mail and SMS messaging. Offering a web portal would relieve the pressure on traditional channels such as the counter and the telephone. Instead information could be retrieved or submitted without the need for human intervention, thus saving waiting time, dependency on opening hours and chance of incorrect processing of data submitted by phone or via notes taken at the counter. To improve efficiency, back offices were reorganised and data exchange with a number of external agencies was automated.

Delegating data input to users meant that responsibility for accuracy of much of the data in the IB-Group’s databases now lies with the customers themselves. From the perspective of speed and directness, this is advantageous. For the students, controlling their own data entry meant

that not only could they carry out this transaction online, but that the results of their action would be delivered more immediately, for example an increase in the amount of loan payment.

However, allowing customers direct access in order to enter and update data still meant that the IB-Group needed to verify every change in the data entered by the student. To ensure prompt verification and prevent possible fraud, data needed to be exchanged automatically (overnight) between participating institutions, such as municipalities (who have very tight controls on their residents' personal data), insurance companies, banks and the tax authorities.

Channels

Four user channels are now available: the web portal including e-mail, SMS, telephone, and physical (post and in-person).

- The web portal offers online forms that allow data entry and data updating.
- SMS messages are used only for identification purposes.
- IB-Group is actively stimulating the switch from traditional channels (counter and telephone) to the web portal.

Impact

- More accurate and faster services, thanks to more accurate data in the central data repository and more channels to provide the data. This success is partly due to the fact that students have the necessary skills and motivation to use the new channels, and that back-office staff had no major resistance to the organisational and technical changes.

- Increased levels of customer satisfaction, which are even higher with the new digital channels than the traditional physical and telephone channels, evident from decreasing telephone calls, decreasing telephone on-hold time for users, decreasing visits to physical desks, and dramatic increases in the use of the web-portal, e-mail communication and web-forms. At the beginning of 2004, approx. 100,000 students were using the web portal. This amounts to approx. one sixth of the entire student population.

- Reduced costs of communication for both the customer and organisation. The return on investments has already been reached. Because of a decrease in paper communication and more efficient management of telephone communication, fifty full time telephone agents have become redundant. The estimated cost reduction as of August 2003 is over € 2,000,000 annually, with further cost reductions expected in future.

Aspects of special interest for multi-channel service delivery

- The main challenge of the project was the need for authentication technology and secure communications. Because no ready-made PKI solution was available at the time, the group invested in developing a system of SMS authentication. A solution was developed on the basis of a combination of GSM and SMS technology, which allowed students to access the system at any time, from anywhere. The authentication solution is now available as open source software.

- Implementation of new technologies imposed a risk of over-automation at the expense of personal contact, which is still required, especially in exceptional cases. This was the reason to maintain traditional channels that allow person-to-person communication.

7.6 Poland: Infokiosks

Service **Public service information**
Channels **Information kiosk, public internet access point, website**

Introduction

In the late nineties, few people in Poland had access to the internet (even today, internet penetration is fairly low). An immediate consequence was a small number of people with internet skills and, relatively high costs for equipment and access.

At the same time, information about government services was limited to the offices of government departments. The only way to find out which documents would be needed for a particular service was making a phone call, often with long waiting times and incomplete answers, or visiting the office in question and wait in a line to ask a simple question.

In 2000, the Office of the Civil Service, with assistance from the Phare programme, started a project called "Friendly Administration". The project's aim was to improve communications between public administrations and citizens. Although setting up websites seemed a plausible step, it was clear that this measure would not achieve the stated goal because of the low level of internet penetration, especially in private homes.

To overcome this digital divide, the government developed an information service that was made available in public kiosks and via a website. Especially for the kiosks, ease of use was a primary objective since many potential users had never used a computer. To ensure sufficient simplicity, the kiosks used touch screens with large buttons, similar to the screen of an automated teller machine.

The service provided via the kiosks addresses the following objectives:
- offer easy access to information about public services, e.g. which services are available, where to go and what documents to bring;
- offer transparent information, stated in clear and simple language rather than quotes from official documents;
- improve the image of the public service by adopting a user-centric approach and showing that civil servants can serve the public.

To enable the service and offer up-to-date information, different government departments had to collaborate. To facilitate this process, an editor's network was set up, consisting of 70 employees of 30 different ministries and agencies.

The "Friendly Administration portal" service was inaugurated on Civil Service Day, 17 November 2003.

Channels

- Kiosks with touch screens offering access to internet-based information services. Interaction is limited to the touch screens, which means there is no text entry or full browsing facility.

- Web pages that offer the same information via PCs.

Impact

- Access to web-based information for a significant number of persons who have no access to PCs.
- Easy access to information about government services.
- Improved government services.
- Improved image of the public sector.

Aspects of special interest for multi-channel service delivery

- Effective measures to overcome digital divide and reach out to segments of the population who are entirely unfamiliar with internet applications.
- Turnaround process from a government-centric approach to a user-centric approach.

7.7 Spain: Citizens income tax

Services offered	**Online declaration of income tax, payments of taxes owed and processing of refunds**
Channels	**Interactive website, accessible from traditional PC or Public Access Points, electronic forms, online payment facility**

Introduction

The income taxation process is characterised by the need to handle very sensitive data, integrate data from many different offices and possibly integrate income data from several employers per employee. Electronic service delivery for income tax declarations is faced with special requirements in the areas of documentation handling (e.g. tax deducted by employers, invoices, etc.), authentication of taxpayers, and secure transmission of sensitive data.

Before the online tax service was implemented, taxpayers were obliged to obtain their tax information from several agencies involving many different channels. The aim of the tax agency was thus to improve the efficiency of collecting taxes by simplifying the process for taxpayers as well as for staff. Part of this aim was realised by providing the taxpayer with relevant information already possessed by the tax agency, and pre-filling this information on the relevant declaration forms. Moreover, the completion of the declaration should be made easier, with paper work no longer necessary and fewer required documents. In addition, mistakes and misinterpretations had to be reduced. At the same time maximum security levels had to be maintained.

Other overall aims of the Spanish administration were the testing of their digital signature in a concrete service context, and the provision of a quality service leading to an increased demand for electronic services by taxpayers. The online tax declaration service is, therefore, an important component of overall progress toward an Information Society in Spain. This was the reason for integrating the organisation in charge of providing digital signatures and relevant trust centres into the process.

Channels

- Filing an income tax declaration is now possible via a special assistance programme for income tax declaration, PADRE, which is available both online and offline (via the website

of the Spanish tax agency or on CD). The user files his declaration by downloading personal tax-related information from the website of the Tax Agency and/or by filling in the necessary data in the PADRE programme. While a user files his tax form, the tax amount (refund or paying in) is automatically calculated and shown in real time.

- Declarations can also be presented by using public internet access points installed by some municipalities and regions.

- Taxes can be paid via the website of the Tax Agency thanks to close interaction between the public organisation responsible for digital signature certificates (CERES), trust centres, banks and the Tax Agency. The entire declaration can thus be completed within one session. Users without digital signature or offline-users generate and print a PDF form with a special point code. This code is similar to a bar code (with much more information) and can be read by a laser at the local tax office where the declaration needs to be presented.

Impact

- The main advantage for users lies in the calculation of the tax amount (whether tax refund or tax payment) in real time, and the completion of the declaration in a single, online session. On average, refunds to taxpayers have been shortened from approximately 90 days to 25 (around 70% less).

- More than 80% of responding users are satisfied or very satisfied with the new online tax declaration. In relation to the degree of difficulty of the system, about 80% assess the tax declaration as of “low” or “medium” difficult.

- Taxpayers do not need to collect data from the different entities any longer, because the workload is shifted from the taxpayer to the online taxation system. A taxpayer needs to be submit additional data only if the Tax Agency does not have the full set of required data.

- Benefits for the agency are that the information filed by the taxpayer is transmitted in real time, even before this information is transmitted previously by other agencies or institutions. The quality of information has also been improved, as it is validated during the process, helping to present declarations with fewer errors or gaps. In addition, the payment transaction itself is carried out with no further delay and the average time for refunds has been reduced from 90 to 25 days. Thus, digitisation has effectively shortened both payments and refunds.

- Since the basic principle of income tax declarations did not change as a result of digitisation, neither did the back office situation change drastically (the back office had already been re-organised before the declarations were made available online). Civil servants were trained with respect to the new information systems. Today, a lot of data capture work is simplified due to the online service. However, the same back offices remain involved and no significant staff turnover was noticed.

Aspects of special interest for multi-channel service delivery

- About 12.2% of the Spanish taxpayers used the released version of the 2003 declaration campaign. This means an average increase of 50%. This is an important statistic in a country with a low internet penetration rate (less than 35%).

- Back office integration was of extremely high importance since many public and private organisations were integrated in the taxation workflow. Because a large number of

formerly independent agencies needed to collaborate, the main limits were imposed by differences in cultural and institutional frameworks rather than technical obstacles. In other words, the human factor and close cooperation was a major factor in the success of the project.

- The payment solution became possible thanks to cooperation with the finance sector.

- Several laws and orders had to be changed to resolve the relevant issues regarding identification, authentication, privacy, etc.

- The possibility of a representative presenting the income tax declaration on behalf of the taxpayer has allowed the achievement of an impressive number of declarations presented via the internet. With 300,000 digital signatures, more than 1.7 million declarations have been submitted. This facility enabled many people who do not have the digital signature to file the income tax declaration electronically, thereby achieving the benefits this presents. It seems that the digital signature is still an obstacle for many people using eServices. Without the use of representatives, the number of online declarations would not have been so high. With this method, it is possible to reach a larger number of citizens.

7.8 United Kingdom: National Health Service (NHS)

Type of service	**Direct, personal health services as well as generic information on a wide variety of health-related topics and facilities; online booking service under development**
Channels	**Website accessible from PCs and information kiosks, telephone support, e-mail, walk-in centres, digital TV**

Introduction

The National Health Service is committed to making its services available by means of a variety of channels (face-to-face, telephone, internet, digital TV, etc.) in conformance with the Channels Framework published by the UK Government's Office of the e-Envoy.

The primary drivers for the NHS implementation of a multi-channel strategy are the UK Government's NHS Plan vision to provide NHS services that are focussed around the needs and wishes of patients and their carers, and the drive to provide access to public services over a variety of information channels. It is recognised that there is a need to provide citizens with easy access to clinical advice when it is not always possible or convenient to go to a GP (general practitioner) surgery or hospital A&E (accident and emergency) department, or if the citizen is unsure what was necessary.

The major element of healthcare is necessarily face-to-face. In addition to traditional access channels via general practitioners and hospital accident and emergency departments, clients can use the NHS network of "walk-in" centres to obtain health advice and nurse-led care for minor injuries and illness on demand. The centres are located in major towns and cities throughout England. Locations and details about the walk-in centres can be found on the NHS.uk website.

NHS Direct (www.nhsdirect.nhs.uk; NHS24 in Scotland: www.show.scot.nhs.uk) provides a national 24-hour nurse telephone advice and health information service for patients in England and Wales, providing confidential information on what to do if someone needs medical help, particular health conditions, and local healthcare services such as doctors, dentists or late night opening pharmacies.

NHS Direct Online (www.nhsdirect.nhs.uk) is an internet-based health information service that operates in close liaison with NHS Direct and the NHS.uk programme. Whereas NHS Direct is a personal, confidential service with clinicians directly interacting with citizens regarding specific issues, NHS Direct Online provides generic, quality-assured information about a range of health issues, including information about NHS Services and patient support groups. The service includes a facility that allows patients to ask questions by e-mail.

NHS.uk (www.nhs.uk) is an internet-based service that provides extensive information about NHS organisations and services in England. The other UK countries have equivalent facilities: www.show.scot.nhs.uk for Scotland, www.wales.nhs.uk for Wales, and www.n-i.nhs.uk for Northern Ireland.

Channels and future developments

- General information services are currently available over the internet. These can be accessed from a traditional PC, as well as from information kiosks located in NHS centres, libraries and supermarkets. Advice can also be requested by e-mail.

- The NHS "Healthspace" facility enables citizens to record personal health information on a secure website.

- Before the end of 2004, the NHS will offer a facility that allows primary care practitioners to book hospital appointments for their patients. A next step will extend this functionality to enable patients to book appointments with GPs and to change hospital appointments directly.

- NHS Digital television services are currently being developed in a number of areas. The initial services are intended to provide a public information service (essentially one-way), using material generated from the existing web-based services. Future developments of the services will enable interaction between callers and the NHS Direct telephone advice service.

- A pilot project related to the NHS Service is the Ten-Care project, which concerned the interactive use of digital television by means of set-top TV boxes. The project was specially aimed at the elderly and disabled, chronic and/or terminal patients, users of social alarm services and population in remote and isolated areas, and provided access to internet-based information services by means of digital television. The pilot project demonstrated that TV-based internet is an excellent channel, whose low cost is ideal for a significant part of the health-care population.

Impact

- The NHS Direct Online web-based information service has proved to be very successful. The latest available figures for NHS Direct Online show average monthly visits to the NHS Direct Online website of around 550,000 per month. The overall month-on-month trend is increasing, from just under 500,000 in April 2003 rising to just over 750,000 in February 2004. From its nature, user satisfaction is more difficult to measure, as it is essentially an anonymous, general information service.

- The NHS Direct telephone advice service (which offers specific clinical advice to callers) has also proved to be very successful with surveys indicating up to 97% satisfaction with the service.

Aspects of special interest for multi-channel service delivery

- Mix of channels for direct personalised information and generic, general information, accessible from a single interface.

- Because a significant number of users may not have access to the website from a PC at home, and thus to avoid social exclusion, public access points have been made available in NHS centres, libraries and supermarkets. The future extension to digital TV will also contribute positively to this aspect.

7.9 The Netherlands: ABN♦AMRO Bank

Service	**Full range of banking services**
Channels	**Web portal, mobile channels, SMS messaging, call centre, IVR, ATMs, traditional counter**

Introduction

ABN♦AMRO Bank is the largest banks in the Netherlands. Its comprehensive portfolio of banking activities is aimed at the private as well as the business segment. In order to retain and improve its market position, the bank is continually improving the quality and efficiency of its services. A key component of this strategy is the implementation of an integrated, multi-channel service provision.

By implementing its multi-channel strategy, the bank wants to devote more attention and time to sales activities by improving the efficiency of its back office processes and by offering a uniform and consistent set of services on a 24*7 basis. In so doing it offers services that are aimed at the requirements and lifestyle of its customers, thereby taking into account the financial value of its customers. At the same time, the strategy is aimed at reducing costs by avoiding duplication of channels and deploying staff and resources more efficiently.

Important aspects of the strategy include a futureproof infrastructure that allows simple and prompt addition of new channels, cost control by means of re-use of applications and data, and reduction of costs and errors by using centrally stored data.

A key component of the design strategy is channel independence, which is expressed in the following features.

- Single and central customer view: this customer view is available to all channels, providing insight into all relevant aspects of and activities for a customer (in so far as this is legally permitted).

- Generic, re-usable functionality for the various channels: each channel offers the same set of advisory, sales or service functionality in a consistent manner. The customer receives the same service irrespective of the channel he chooses.

- Coordination of commercial activities over all channels: all channels offer the same set of products and make use of the same sales leads and events. Moreover, the central database ensures that each channel has access to the same set of information on running contacts and agreements with the customer.

- Generic security functionality: services for identification, authentication, access control, authorisation and electronic signatures access a central database with access rights and rules, which apply to all channels and users (customers and bank employees).

Channels

- Internet channels: standardisation by means of internet technology (browsers) is an essential feature for customers as well as bank employees. Internet channels are available in the customer's home and office (self-service via PC), the bank counter (bank employee enters or consults data) and the Customer Contact Centre (see below).

- Mobile channels: Mobile banking (via GSM/WAP or GPRS) allows the customer to use payment or investment services. In addition, services such as picture SMS (stock exchange graphs) and SMS Pull (information requests via SMS) are available. For security reasons, i-Mode (mobile internet) is not available yet.

- Automated Teller Machines serve as a type of kiosk, offering the frequently needed service of money withdrawal, and thus alleviating the counter's workload.

- Customer Contact Centre: personal assistance in an ordinary phone call or by means of Computer Telephony Integration software, in which a call centre agent uses the internet channel to access the relevant customer data and information on the services requested. Automated assistance is provided by means of Interactive Voice Response (see below).

- Interactive Voice Response: After the IVR platform has identified a caller, it can provide a set of services or carry out transactions without human interference. If required, the caller can be connected to an employee in the Customer Contact Centre. The IVR-system offers 24*7 access to services for payments, investments, mortgages, loans and insurances.

Impact

- Significant increase in sales by means of self-service channels (caused by a shift from traditional channels as well as by new contracts).

- Customer satisfaction has continued to be satisfactory or has improved.

- Significant cost savings have been achieved, especially because the bank has been able to reduce its number of offices with counters and replace these by automated teller machines and services provided via electronic channels.

- In a June 2002 Forrester survey report (Making Europe's Online Banking Sell) that reflected a survey of 20 internet banking sites in Europe, ABN♦AMRO ranked as the best performing bank in Europe.

Aspects of special interest for multi-channel service delivery

- Even though this is a case from a commercial environment, it is a good showcase of a current implementation for which the objectives combine improved customer services and reduction of costs.

- The design strategy includes the principles of integrated services in both the front office and the back-office, generic functionality and re-use of service components.

7.10 Germany: Railway timetable and electronic ticketing

Services offered	**Consulting railway timetable, ordering and buying traditional and electronic tickets**
Channels	**Website for traditional PC, PDA and mobile phones, SMS messages**

The website of the German Railways allows a user to consult its timetable, order tickets, pay tickets by means of credit card, and print the ticket. The PC version of the website (http://www.bahn.de) offers the most extensive version of the site. Lighter versions can be consulted by means of a PDA (http://pda.bahn.de) or a mobile phone (http://mobile.bahn.de).

An interesting feature of the booking system is a current collaboration pilot between the German and Dutch railways: a user can book and pay for a ticket on the site (until 1 hour before departure), and subsequently receive his electronic ticket by means of an SMS message. The SMS message is then used as proof of payment when the passenger is asked to show his ticket.

8 Impact for pan-European eGovernment service delivery

Pan-European eGovernment services are meant to be cross-border public information and interactive services, either sectoral or horizontal, i.e. of a cross-sectoral nature. They are provided by European public administrations to European public administrations, businesses and citizens.[20]

The development of a multi-channel approach to the delivery of pan-European eGovernment services will require further investigation. The outcome of other studies such as the study on stakeholder requirements for pan-European eGovernment services will provide guidance on the services to be implemented. Once the list of services is selected, an assessment of the opportunities of a multi-channel approach for delivering such services should be conducted. The implementation guidelines and channel selection framework as described in previous chapters will prove their usefulness at that stage.

In the short term, multi-channel aspects are relevant in two areas: the portal of the EU Administration and the IDA Architecture Guidelines.

8.1 Implementation aspects for the portal "Your Europe"

The aim of the "Your Europe"[21] portal (http://europa.eu.int/youreurope/) is the provision of public online information and interactive services with a cross-border dimension to European citizens and enterprises. It assists citizens and businesses in pan-European activities by providing general European and national information in the form of short introductory texts and relevant links.

Many services that will be provided through "Your Europe" originate from other domains (European, national, local). This means that domains must interoperate to provide the requested services to users.

If it is decided to implement multiple channels, e-channels will predominate because they are within reach of the widely spread user community. For the same reason, it does not look practical to provide counter services. A traditional channel that could play an important role is a telephone service operated by a call centre like that already available as part of the Europe Direct[22] service (which can also pass specific enquiries to the Citizens Signpost Service[23] for

[20] See art. 3 of the Decision 2004/387/EC of the European Parliament and of the Council of 21 April 2004 on interoperable delivery of pan-European eGovernment services to public administrations, businesses and citizens (IDABC).

[21] Revised strategy paper for the 'Your Europe' portal (http://europa.eu.int/ISPO/ida/export/files/en/1960.pdf)

[22] "Europe Direct" (http://europa.eu.int/europedirect), also accessible by e mail and telephone, provides general information of public interest on specific EU policies. Information can also be found in e.g. "Info-Points Europe" and "Rural Information Carrefours", and "Euro Info Centres" (for SMEs).

[23] http://europa.eu.int/citizensrights/signpost/front_end/signpost_en.htm

reply by telephone or refer enquirers to the Solvit[24] personalised problem solving service). It is suggested to investigate further synergies between these services.
Considering the co-operative approach of the portal where different national administrations are involved in delivering the content, a more in-depth study on the particular user and provider requirements will be needed in the pre-implementation analysis for multi-channel service delivery.

8.2 Proposed modifications to the IDA Architecture Guidelines

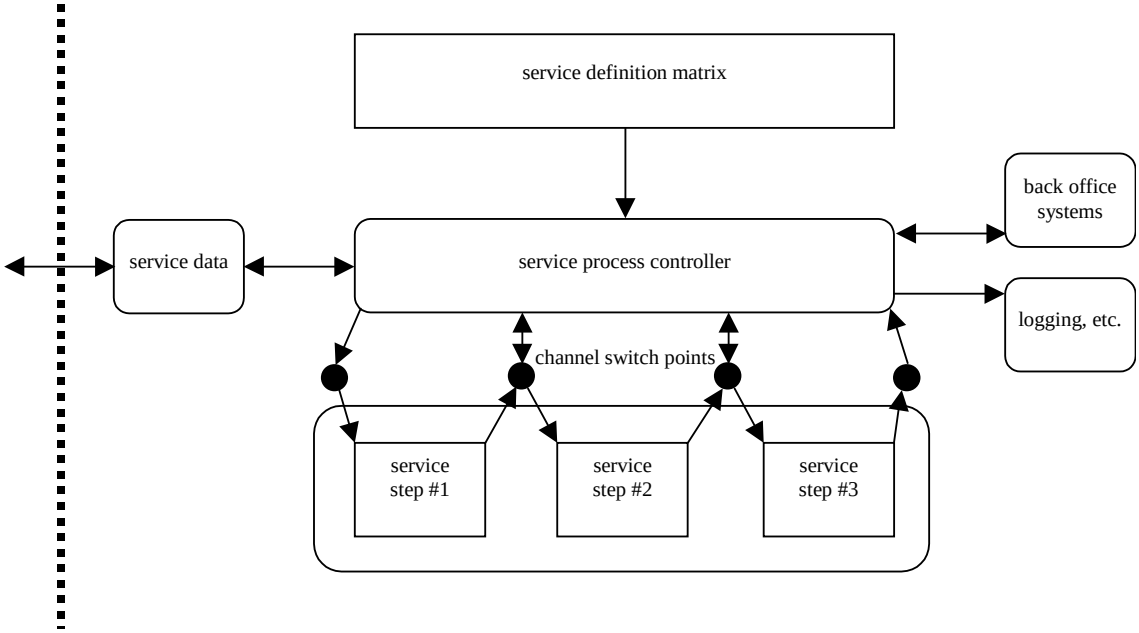
The IDA Architecture Guidelines provide the technical platform for pan-European data interchange.

The guidance in the IDA Architecture Guidelines consists of:
- a set of implementation principles;
- an approach for implementation in terms of general solution models;
- roadmaps that offer guidance from requirements to implementation;
- annexes that describe available generic services facilitated by the Commission, the open standards on which the advised solution models are based, and a number of best practice examples.

Required update activities

In order to ensure that the IDA Architecture Guidelines comprise the technical aspects and standards that are required for multi-channel strategies, the following activities need to be performed.

1 Include a description of the following architectural model for multi-channel service in the main document.



[24] "Solvit" (http://europa.eu.int/comm/internal_market/solvit) provides problem solving capabilities in the internal market. The Solvit Centres can be reached by mail, telephone, fax or e-mail.

The description of the model must define the following components:
- building blocks that accept a user demand, serving as front-ends for a variety of channels;
- building blocks that break the user demand in a set of queries to be individually placed with mid and back office functionality;
- building blocks that locate the relevant back office functionality across independent operations;
- components that collect responses from the back office and prepare them for presentation across a variety of channels.

2 Roadmaps that offer guidance from requirements to implementation need to be revised and expanded in order to include the business requirements for multi-channel public e-services.

3 The current set of best practice examples in the Annexes must be extended in order to include multi-channel public e-services. A suitable case would be the OJS Publication system.

4 Perform a review of the annexes with service specifications, open standards and best practice examples.
A review is necessary to check whether latest standards and technologies are included. Attention should be paid to technological developments in the field of interoperability that have occurred since the last version of the IDA Architecture Guidelines was published. Think in this respect of:
- Web services model, ebXML and ASP applications;
- SOAP, WSDL, UDDI, SAML, XKMS, XML signature;
- XML standardisation in content interoperability domains;
- Harmonisation of data structures and XML schemas;
- J2EE developments and its integration with SOAP and ebXML.

Particular emphasis should be placed on the general service specifications in the Annexes:
- Data presentation and exchange, section Interfaces
  - > Review and extend the specifications of SMS-messaging, WAP, and IHTML.
  - > Insert a new section on iDTV.
  - > Insert new sections on UMTS, GPRS, and WiFi.
  - > Insert a new section on Content Management Systems.
  - > Insert a new section on portal technologies.
- Security services
  - > Review the information and extend with services for identification/authentication by means of mobile phones.

9 Conclusion

9.1 Key findings

Modern day government is faced with two seemingly contradictory objectives:
- to improve the manner in which it serves its user community;
- to reduce the costs of providing its services.

To meet the first objective, an administration needs to take into account the requirements of the users of its services. Users should:
- be able to access services anyhow, anytime, anywhere, made possible by e-channels and mobile devices;
- be able to have direct interaction with a service provider when this is needed, thus requiring (some) counter and telephone services;
- be aware of the existence of services, and services should be findable, usable and affordable;
- receive quality in terms of timely delivery and compliance with reasonable expectations.

To meet the second objective, an administration must balance efficiency improvement with its organisational requirements.
- Cost savings can be realised by e-channels that require little or no staff involvement. Efficiency can be improved by business process redesign, back office integration and component re-use.
- Because an administration must work in compliance with applicable legislative frameworks and societal expectations, cost savings that may be possible from a technical perspective cannot always be implemented. Channels such as the counter may have to be retained (although their number can be reduced) and (e-)inclusion must be raised.

In both cases, services and service delivery should be trustworthy and confidential, both objectively and in the user's perception.

A successful channel strategy must be underpinned by an architecture that allows channels to interoperate instead of merely co-existing. In a mature multi-channel approach data are entered only once, stored in a central repository, and are then available in all channels and processes, thus eliminating the need for complex protocols to keep these data attuned.

Re-use of "modules" (e.g. user data, process steps and applications) will reduce costs, because fewer components need to be developed, maintained and managed, which will ultimately lead to cheaper services for the user. Cooperation in the development of modules within and between administrations will achieve economies of scale, which also leads to lower total costs.

Channels range from traditional channels such as the counter and telephone to e-channels such as internet, e-mail, instant messaging, SMS, interactive voice response systems and digital television. Moreover, channels (platforms, devices, etc.) become more and more integrated, thus constituting new channels. When channels are selected, the following features must be assessed:

- directness of the channel, which may be required in urgent situations and complex services;
- accessibility and inclusion, which is especially important with respect to a potential digital divide for certain user segments;
- speed, which may be a critical factor in providing time-critical information in situations such as emergencies;

- security and privacy, which are required in interactions that involve sensitive information or the transfer of money, and are therefore critical in the take-up of electronic channels;
- availability, which determines whether a service must be available round the clock (e.g., websites or IVR systems) or only when direct contact is required (e.g., counter or telephone).

In general, the channel selection process consists of the following steps:
- make a preselection of channels, based on the service provision requirements for each service type to be offered;
- fine-tune this preselection, taking into account channel preferences of potential users as well as the technical and organisational appropriateness from the provider's perspective;
- determine which channels will realise the best public value, based on costs and benefits.

9.2 Recommended solutions

Multi-channel strategies can meet both of the objectives as stated above. By introducing more service delivery channels, especially e-channels, administrations can offer their constituents better services. Moreover, service provision by means of these channels is usually less expensive than by means of more traditional channels.

The following table lists the channels with the user and provider benefits:

Channel	**User benefits**	**Provider benefits**
Call centre	• available on a 24*7 basis • can handle different kinds of contact • can handle different kinds of services • services can be accessed from home or on the move	• less expensive to operate than traditional channels
E-mail: organised around automated response	• available on a 24*7 basis • services can be accessed from home or on the move	• inexpensive: no personal contact required • can be sent to many users at the same time
E-mail: organised around manual response	• services can be accessed from home or on the move • less formal than office visit	• less expensive than "in person" contact
Interactive digital TV	• available on a 24*7 basis • services can be accessed from home	• potentially high penetration • may raise e-inclusion • services can be offered to many users at the same time
Interactive Voice Response systems	• available on a 24*7 basis • services can be accessed from home or on the move	• relatively inexpensive • high penetration of access devices

Channel	User benefits	Provider benefits
Mobile devices	• services can be accessed irrespective of location • offer functions such as telephony, SMS, e-mail and access to the internet	• raises e-inclusion
SMS	• available on a 24*7 basis • services can be accessed from home or on the move	• notification services • no personal contact required • inexpensive
Telephone	• services can be accessed from home or on the move	• high penetration rate
Websites	• available on a 24*7 basis • services can be accessed from home or on the move	• relatively inexpensive • can contain very large volumes of information • use of fast internet connections still growing

The following table lists the type of service and the preferred channels:

Type of service (step)	Channel	Comments
General information: complicated and/or much information	web	• Users must have device with screen of "regular size". • For heavy websites fast connection necessary. • Printer may be needed.
	e-mail, counter	• If user needs support in selecting information. • Relatively expensive.
General information: simple and/or small amount of information	web, e-mail, SMS	• Standardised information requests can be handled automatically.
Requesting (looking for) forms	web	• Inexpensive.
	e-mail, SMS	• Inexpensive if handled automatically. • SMS only suited for receiving very short forms.
	telephone	• If handled through IVR less expensive than "manually".
	counter, mail	• Expensive.

Type of service (step)	Channel	Comments
Returning forms	web	• Inexpensive. • Forms can be handled automatically. • Security and privacy must be ensured.
	e-mail, SMS	• Inexpensive if handled automatically. • SMS only suited for very short forms. • Security and privacy must be ensured.
	counter, mail	• Expensive.
Communication, transaction: complex	counter, telephone	• Expensive but direct.
	(e-)mail	• Less expensive and less direct.
Communication, transaction: simple, standardised	web, IVR	• Inexpensive. • Security and privacy must be ensured.
Complaints	telephone, counter	• Expensive, but user needs a direct channel.
Notification	SMS, e-mail	• Inexpensive and fast. • Can be automated.
	mail	• More expensive and slow.
Transaction (payment)	counter, telephone, web	• Security and privacy must be ensured.

9.3 Impact

The following best practice cases demonstrate that a well-designed multi-channel approach can achieve benefits such as increased availability, faster services, shorter waiting times and decreased administrative burden as well as cost savings due to reductions in staff, less paper work and more efficient business processes.

Case/channel	Feature	User benefits	Provider benefits
AU, HELP.gv-portal web portal and mobile devices	Online certificate of residence	• time savings • 24*7 service availability	• reduced staff requirements • considerable cost savings
BE, Crossroads Bank web portal, central data repository	Data needs to be entered once only, and is then re-used by all parties	• more accurate data • time savings	• reduced staff requirements • considerable cost savings

Case/channel	Feature	User benefits	Provider benefits
ES, Income tax website, online payment facility	Online declaration and payments and refunds of taxes	• less waiting • refund times reduced by 70%	• less paper work • reduced staff requirements
NL, MY-IB-Group website, SMS-messaging	Interactive data-entry by students applying for loans	• more accurate data • less waiting • faster loan payments	• less paper work • reduced staff requirements (50 FTEs) • cost savings (€ 2,000,000 annually)

Other best practice cases show the following user or provider benefits:

Case/channel	Feature	User / Provider benefits
EU, Office for Official Publications, online forms	Entry of tender notifications in structured format	Processing time reduced from 12 to 5 days
MT, SMS-messages	Notification services	Just-in-time availability of information in an area with a low rate of computer penetration
UK, website	Online information	24*7 Access to comprehensive, self-service health information

These cases show that e-channels play a major role in achieving significant benefits for the user as well as the provider. To overcome a possible digital divide for user segments without devices for accessing internet-based information at home, kiosks, public internet access points and possibly interactive digital TV are essential.

The details of the case descriptions in chapter 7 also show that channels for direct interaction, e.g. counter and telephone services, are still required to allow communication about complex or urgent issues.

The cases also show that if requirements of users are met, citizens and businesses feel that they are receiving better services. Subsequently the administration delivering the service is perceived more positively.

9.4 Recommended follow-up activities

1 Develop templates for a business case and for assessment of measures taken
   - A template for a business case will help in showing the considerations to be made, and in the quantification process of converting objectives, requirements and expected results into costs and expected yields.
   - A template for customer surveys and recording of usage statistics will support monitoring and assessment activities.
   - Many administrations are likely to be unfamiliar with these activities, and would be well assisted with customisable templates. Moreover, standardisation of these methods would facilitate comparing of results.

2 Study the benefit of multi-channel strategies, including the effects of pricing policies
   - A large number of available best practices described in cases have not shown a cost/ benefit analysis, whereas this information is of essential importance in the evaluation of channels to be implemented.
   - Usage frequency of particular channels can be influenced by pricing policies. For example, an administration may levy a charge for sending, receiving and processing paper forms, whereas the usage of the same form online is free of charge. In a similar way, a pricing policy can be adopted to decrease the usage of counter services for information or transactions that can be performed online. These policies are actively used in the private sector, and information on policies and their possible effects is of value for administrations that want to manage their channel strategy pro-actively. A relevant consideration is the fact that legislation may impose particular obligations on public administrations that do not apply in the private sector.

3 Perform a detailed study of user preferences
   - A follow-up study should investigate user preferences per type of service, geographic area, age, social status, etc. Results of this study would be valuable input for user segmentation, profiling and Citizen Relationship Management. In addition to surveys that yield new information, the study can also disclose information already held by local administrations and make this information available at a pan-European level. Central availability of this information will enable administrations that want to implement services and channels at the pan-European level to use this information.

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