



User expectations of a life events approach for designing e-Government services

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Contents

Authors	i
1 Executive summary	1
2 Introduction	8
2.1 Aims and objectives	9
2.2 Study methods	10
3 Findings	12
3.1 Current situation	13
3.1.1 Policy overview	13
3.1.2 Recent policy developments	13
3.1.3 Situation from the point of view of government.....	15
3.1.4 Situation from the point of view of users	16
3.1.5 Shifts from Web 1.0 to Web 2.0 and from Gov 1.0 to Gov 2.0	17
3.2 Desired future situation	18
3.2.1 Four potential life event scenarios	19
3.2.2 How the life event scenarios would be accepted by users	19
3.2.3 General results from interviews with key stakeholders	21
3.2.4 Evolution of the life events concept	21
3.3 Enabling mechanisms	24
3.3.1 Definition of a potential architecture.....	24
3.3.2 The benefits of service-oriented architecture.....	25
3.3.3 Target service architecture	25
3.3.4 Implementing a service-oriented architecture	27
3.3.5 The opportunities offered by a service-oriented architecture ..	27
3.3.6 Roadmap of migration to a service-oriented architecture	28
3.3.7 Resources needed to achieve the target architecture	29
4 Conclusions	31
5 Recommendations.....	34
5.1 Policy orientations	34
5.1.1 Practical efforts needed to support the policy orientations	34
5.2 Technically-oriented actions to support the policy orientations.....	35
5.3 Other practical and applied orientations.....	36
6 Discussion	37
6.1 Life events approach and its benefits.....	37
6.2 Life events and the organisation of services	38
7 Bibliography.....	39

8	Annexes	46
8.1	Annex 1 - Life event visual mock-ups.....	47
8.1.1	Scenario 1: 'Stolen valuables abroad'	47
8.1.2	Scenario 2: 'Studying abroad'	59
8.1.3	Scenario 3: 'Working abroad'	72
8.1.4	Scenario 4: 'Trans-European Health Crisis'	83
8.2	Annex 2 - User experiments	96
	People's use of eGovernment services	96
	Design implications which follow from people's use of eGovernment services	97
8.3	Annex 3 - Online user survey	98
8.4	Annex 4 - Interviews with key stakeholders.....	99
8.4.1	Background	99
8.4.2	Approach	99
8.4.3	Content and orientation	99
8.4.4	Life Events.....	99
8.4.5	Conclusions	100

Technological abbreviations

Abbreviation	Full expression
Ajax	asynchronous Java script and XML
API	application programming interface
CSS	cascading style sheet
DVD	digital versatile disc
EAP	extensible authentication protocol
HTML	hypertext mark-up language
IAAS	infrastructure as a service
IDM	identity management
IDTV	interactive digital television
JSON	JavaScript object notation
MSN	Microsoft Network
MySQL	My Structured Query Language
POC	point of contact
RIA	rich internet application
RM-ODP	reference model of open distributed processing
RSS	really simple syndication
SOA	service-oriented architecture
STORK	Secure Identity Across Borders Linked (a large-scale pilot)
TOGAF	The Open Group Architecture Framework
TV	Television
UDDI	Universal description, discovery, and integration
WSDL	Web service definition language
Web 1.0	Web 1.0
Web 2.0	Web 2.0
XHTML	extensible hypertext mark-up language
XML	extensible mark-up language

Institutional, organisational, and methodological abbreviations

Abbreviation	Full expression
CBA	Cost benefit analysis
EC	European Commission
EIF	European Interoperability Framework
EIS	European Interoperability Standard
EU	European Union
Gov 1.0	Government 1.0
Gov 2.0	Government 2.0
ICT	Information and Communication Technology
IDA	Interchange of Data between Administrations
IDABC	Interoperable Delivery of European eGovernment Services to public Administrations, Business and Citizens
ISA	Interoperability Solutions for European Public Administrations
MS	Member State
NGO	Non-governmental organisation
OECD	Organization of Economic Co-operation and Development
PSI	Public sector information
SPSS	Statistical Package for the Social Sciences
STORK	Secure Identity Across Borders Linked (a large-scale pilot)
UK	United Kingdom
UPS	United Parcel Service
US	United States
USA	United States of America

1 Executive summary

This study provides a future vision of eGovernment service provision that is based on a life events approach, user expectations, key Web 2.0 enablers, and a service-oriented architecture paradigm.

Today's developments in online service provision, particularly in the private sector, reflect a rapidly changing environment in which services are increasingly user-oriented and draw on new opportunities and collaborative approaches. Important trends are observed in the use of Web 2.0 tools: they are under continuous development and deployment in ways that provide innovative interactive online applications. These developments have given rise to a significant uptake of new services based on platforms like social networks and new approaches such as crowd-sourcing, rich content, blogging, and social bookmarking.

The opportunities that Web 2.0 tools can offer are immense in providing user-centric services that can be personalised and integrated in the users' proximity (whether in their own homes or "on the go"). The integration and mashing-up of these services is an important driver for the continued improvement of new, easy-to-use, online services.

The availability of these tools and techniques offers public services, or eGovernment services, an important opportunity to create more value for society as a whole. These gains, as well as costs, were explored in a general way in this study and costings, more specifically, in terms of the proposed architecture and platform.

The desk research carried out during the first phase of this study demonstrated that the development of Gov 2.0, and the use of Web 2.0 in eGovernment service provision, is still at an early stage.

Three core concepts

Life events are important events or "stages in a citizen's life, such as school, marriage, or buying a property" (European Communities, 2003, p4). They can be packaged so that the work of multiple government agencies are concentrated "around a subject that makes sense to the citizen" (ibid, 2003).

Web 2.0 is associated with Web applications that facilitate interactive information-sharing and collaboration on the World Wide Web. It is based on the notion of connectivity and user-centred design. It facilitates large-scale participation and collaboration in terms of creating, editing, ranking and distributing content. By its very nature, Web 2.0, is composed of many hybrid forms, tools, and technologies. Web 2.0 is not an aim in its own right, but is a set of tools that can be used to address the needs and behaviours of users of online services.

Gov 2.0 has been described as: "making use of web 2.0 technologies ... to interact with citizens and provide government services"¹. This study shows that the term Gov 2.0 is based on a combination of social computing (Web 2.0), public service value, and governance, institutional, and organisational trends that open up government services. Trends in this direction indicate public policy shifts towards openness and transparency, engagement with citizens, and the release of non-sensitive public sector information (PSI) and third party collaboration.

¹ Australian eGovernment Resource Centre <http://www.egov.vic.gov.au/government-2-0/10.html> (accessed 3 November 2010)

User needs and behaviour

For this study, a set of user experiments were conducted in a laboratory setting. The user experiments took place in the UK at OxLab in Oxford during summer 2010. One hundred and thirty persons participated in the experiment, which they were given an hour to complete. Each person was provided with four scenarios. All the individuals were asked to think themselves into the fictitious situation. The scenarios described four different life events: all took place in a **cross-border context**. The language used was English, and the sites that the users were asked to search were also in the English language².

The experiment's purpose was to identify the ways in which people approach a life event and how they navigate and use the available online sources to find appropriate solutions.

The four examples of life events used in the experiment involved: experiencing the theft of identity papers abroad, preparing to study abroad, preparing a long-term stay abroad, or dealing with a pandemic threat when travelling.

This exercise provided a number of interesting results. The users used two types of search strategy to find information: When confronted with one of these four life events, the individuals involved in the experiment tended to segregate the separate actions, tasks, and information they needed related to the life event and approached the issue at hand in a 'disaggregated' way. When they searched for the information, they followed two different strategies.

When using a single strategy, the users looked solely at government portals (portal-only) or they relied entirely on a search engine (search-only). When they used a mixed strategy, it meant that they started with a government portal and ended up by searching using a search engine or vice versa.

- Single strategies (i.e., portal-only and search-only) were the most effective; the mixed strategies are concerned the 'search-then-portal' took considerably longer; and the least effective strategy was portal-then-search. Indeed, a significant proportion of those users who started with government portals perceived the portal as not effective in providing the information they needed and had to change towards the use of an open search method.
- Users who were pointed towards government portals (the treatment group) took significantly longer to find the right information.
- Lastly, users found their questions answered significantly faster by searching on private sector sites and Wikipedia rather than on government sites.

These findings may indicate two trends: first, the information provided on the tested government portals is difficult to find and, second, navigation through established paths on government portals is not necessarily optimal when users in a trial setting are trying to find the very targeted information that is needed in relation to a specific life event. Hence, information provision is not optimised so that users can find it quickly by following different navigation paths.

Two lessons can be drawn here from the private sector, and both provide learnings for government services:

- First, online stores offer a "mystery shopping" approach. The stores are based around key "sticky points"³. These points provide separate elements or services that suggest, recommend and link users to the right information or service based on the users' search criteria. This approach facilitates a disaggregated search approach and thereby produces relevant results and links to related topics. Such an approach involves using a range of Web 2.0 and Web 3.0 strategies: Web 3.0 indicates a shift towards a form of guide, based on artificial intelligence (Markoff, 2006) incorporating semantic web (i.e., the meaning of data), personalisation (e.g. iGoogle), intelligent search, and behavioural advertising. The Web 2.0 strategies would involve the use of recommender and reputation systems; user testimonials and feedback facilities; and linking to social networking and data sharing sites. The Web 3.0 initiatives would use the Semantic

² Further details on language use are included in the relevant annex.

³ A "sticky" (or sticking) point is a problem of point on which agreement cannot be reached and which generally prevents progress (adapted from Collins English Dictionary, complete and unabridged (2003)).

Web, the “web of linked data”; complex search mechanisms; and personalised browser technologies.

- Second, more and more services are offered as separate modular elements that can be integrated and re-used in new or other online services. Generally, such a move towards tailored service provision would require governments to shift from a more closed, monolithic manner of service provision towards a more modular, open or atomic way of providing information and services. The toolset provided by Web 2.0 and Web 3.0 techniques is particularly aimed at enabling exactly this type of approach: it could facilitate a move away from monolithic eGovernment towards what this study terms an ‘atomic eGovernment’ model.

Future scenarios of Life Event cases

Based on these findings, the four life event scenarios for future eGovernment services were developed which integrate different Web 2.0 tools. They provide a future vision of service provision in which third party involvement plays an important role.

These four scenarios were translated into visual mock-ups that served to introduce potential users to this new approach to service provision based on life events. They involve a combination of services, both government and private, that are each linked to a single life event and are provided in a single application. This approach shows the potential for re-use of eGovernment services.

The four scenarios are:

- **1. Stolen valuables abroad:** A mobile-based application that provides an integrated approach to service provision associated with the life event of a person having their valuables stolen while abroad;
- **2. Studying abroad:** A social network platform-based application that provides an integrated approach to service provision associated with the life event of studying abroad;
- **3. Working abroad:** A social network platform-based application that provides an integrated approach to service provision associated with the life event of working abroad;
- **4. Pandemic flu:** A multi-channel based application that provides an integrated and crowd-sourcing approach to service provision associated with the life event of experiencing the possibility a pandemic flu threat while planning to travel abroad.

What users really want

A user survey was organised that focused on the four scenarios. It took place in autumn 2010. The survey approached a total of 3,000 persons in three Member States: these were Austria, the Netherlands, and Sweden. Its aim was to investigate the reaction of users to these new types of services. Up to two-thirds of the users in the sample clearly welcomed the ‘stolen valuables’ and ‘working abroad’ scenarios. A majority was also in favour of the ‘studying abroad’ and ‘pandemic flu’ applications, although the responses to these two scenarios were more moderate. The adoption intentions – based on an adoption index for the four scenarios – were respectively 72.04 (1), 61.77 (2), 69.6 (3), and 61.89 (4). The respondents’ intention to adopt these types of applications varied according to their demographics, their individual psychological attributes, and their contexts. Individuals’ orientations in terms of their attitudes towards innovation and their level of trust in the internet affects their intentions to adopt.

In general, the benefits of adopting new Gov 2.0 based applications cited most often by the survey respondents, were **time savings, flexibility, convenience, simplified service delivery and being better informed**. Two-thirds of the students and professionals questioned perceived these five different aspects of new Web 2.0-based ways of offering (public) service delivery as **providing added-value**.

The most important feature of these Web 2.0 applications is the fact that a person can **handle all the necessary formalities by using a single application**. Although user needs differ from one application to another, the most essential features of such a service perceived by the



You start the Global Help Application for European Citizens on your mobile phone...



The first step is to prepare your stay.



So, you install the secure and personalized Expert App in your LinkedIn environment



You check out the new European Swine Flu App, consulting the latest news feeds in a message stream.

survey respondents related either to **user service friendliness**⁴ or to **convenient information provision**⁵.

These essential characteristics correspond directly with the respondents' perceived benefits of time savings, improved flexibility and convenience, being better informed, and being able to access simplified processes of service delivery. **Personalisation and pro-activity** were high on people's list of requirements whereas multi-channel access seemed less essential. Sharing information through user groups and communities was mentioned as a top three feature by only 16% of the respondents.

As far as future conditions for the development of Gov 2.0 are concerned, more than half of the people in the sample target groups were convinced that **public agencies should collaborate with private actors to enable better information and service delivery**. There was a strong belief that – in order to develop new user-oriented service applications – public agencies will have to **open up and exchange their data with other public and private actors**. At the same time, according to at least one out of three respondents, third party involvement in the development and provision of public service delivery applications implies **increased privacy risks**.

Half of the survey's user sample stated that **government agencies should make use of social media platforms more actively**, while only a quarter was convinced that information posted by fellow Internet users is more useful than official government web applications.

According to the platform analysis provided by this user survey, new Web 2.0 based models of public service delivery that are developed by government agencies in co-production with third parties certainly have the potential to **better meet user needs** and, accordingly, to be **adopted by a significantly high proportion of today's online citizens**.

What needs to be in place?

Given the potential offered by these new scenarios, it is important that their development can be made possible. However, this begs the question of what needs to be in place to make this new service provision a reality in the future.

In this study, interviews were therefore conducted with 25 **key stakeholders** such as experts in online eGovernment service delivery, public sector actors, and different private sector players.

These stakeholders identified a number of key enablers that would be needed to facilitate the future vision of service provision. The enablers identified include such elements as *opening up public data*, providing accessible and re-usable public services within a *service-oriented architecture*, and enabling an appropriate *legal framework and standards*.

Government plays an essential role in facilitating the creation of these prerequisite underlying elements. Doing so would also involve addressing some of the most important obstacles to the development of the proposed scenarios: *back-office integration* and *interoperability* in the public sector not only within single countries but also across borders⁶. In other words, **interoperability is an essential enabler of such future eGovernment services**.

A business model is also important. The development of new services based on re-usable public services and data by private sector also requires a clear economic incentive. Facilitating a low threshold to the actual access and use of public services to create new value-added services is important to make this a reality.

It is expected that public demand for Web 2.0-enabled services that provide the complete handling of a 'life event' or action will arise in the near future.

By leading by example, government should aim to develop **basic, re-usable, services that are both attractive for the private sector to build on and end-users to take up**.

⁴ User service friendliness is described as the capacity to handle all formalities – from both public and private service providers - using a single application and being guided pro-actively through all the necessary actions.

⁵ Convenient information provision means being able to obtain personalised information, with government information and services also being ready-to-hand.

⁶ Implicit in this approach would be the provision of another essential enabler, a European electronic identity (e-ID).

Enabling such a development may lead to more user demand for these services, build up greater political commitment, and showcase a clear business case in which the private sector can collaborate.

Service-oriented architecture: a key enabler

In this study, the stakeholders interviewed held clear opinions about **service-oriented architecture**. They indicated that service-oriented architecture is the main approach that would enable a shift towards Gov 2.0 and the re-use of online eGovernment services. The study therefore went on to investigate in some depth the benefits of service-oriented architecture and a possible target service architecture.

Service-oriented architecture is particularly suited to help government agencies deal with the **obstacles** that currently inhibit their service provision. A number of **benefits** are evident. The architecture can help governments to: implement new systems that enable them to modernise their business architecture, integrate agency service delivery, and share information across organisational boundaries. They will also be enabled to: reduce costs by consolidating redundant application functionality.

Service-oriented architecture re-uses application functionality which allows governments to leverage existing applications. In a service-oriented architecture, services are loosely coupled with each other: this enables rapid restructuring and reconfiguration of business processes and leads to more business agility. Applications that are service-oriented are developed and delivered faster than in traditional application development projects. This is due to a variety of factors, including the sharing of services and service composition, and the wrapping of the functionality of legacy assets to provide them through web services.

Various opportunities therefore exist for the EU. When considering the implementation of service-oriented architecture and enhanced collaboration between the public and private sectors, four possibilities exist. These four opportunities are listed here:

- **Providing a service registry at a European level:** One of the key components in the architecture is dynamic service discovery. To enable this, there should be an EU-wide service registry installed as a proof of concept. A service registry enables the re-use and discovery of services.
- **Providing services by local authorities:** In order to enable local authorities to develop re-usable services, a European vision, principles, methodology and standards in a reference framework is needed.
- **Providing open standards at a European level:** An essential aspect of service-oriented architecture is that it is composed of services that can be re-used, extended, recombined or orchestrated to deliver the required functionalities. Open standards can ensure the re-use, combination and orchestration of the existing and future services in this architecture. Open standards could be defined on a European level to ensure these essential aspects of service-oriented architecture.
- **Better collaboration between the public and private sectors:** Governments cannot provide every potential service that citizens might need. However, by putting key services in place, governments can then partially outsource the provisioning of services to private entities. By making these two moves, governments can focus on their own priorities. This would enable the private sector to provide end services to citizens that are composed of both public and private services. Such a move will help make considerable progress towards the notion of the government as a one-stop-shop.

This study provides **a possible roadmap for migrating to a service-oriented architecture**. It is of strategic importance in terms of planning future possible directions.

The roadmap includes an **envisioning phase** in which the vision, the principles, the standards, the methods are set and tested. Three alternatives are suggested for this phase: **describing and implementing a finite set of life events, government as a platform, and dynamic public service mediation**. When the vision and a tested – and agreed – set of principles, methods and standards are formalised, an **implementation phase** could start. It would consist of the installation of the platform, developing and providing services, marketing these services, and evaluating and adjusting the vision, methods and standards.

While costs and benefits (gains) were borne in mind from a general perspective throughout this study, costings were specifically explored in terms of the architecture and platform.

Conclusions

As a final reflection, the study offers some conclusions with regard to the future role of life events; the benefits that can come from a shift towards Gov 2.0 – a Web 2.0 approach to service provision based on life events; and some preliminary observations with regard to cost effectiveness. The study then raises some tentative recommendations for actions.

Life events can offer an appropriate and effective way of structuring services for citizens. These services would be more firmly oriented towards people's lifetime needs. The ways of doing this involve the use of different technologies and channels for **service delivery**, the re-use of public sector information and services, and enabling different options for the provision of **core services**. As a result, public agencies, third parties, intermediaries, and end-users – indeed, citizens themselves – could become engaged much more collaboratively in producing, combining, embedding, re-packaging and delivering a variety of core services. This is implicitly a more Gov 2.0 approach.

Shifts towards Gov 2.0 are already underway: it could be even more firmly based on service provision *via* a service-oriented architecture. It is clear from the outline of the benefits that arise from the proposed new means of service delivery and the expectations of users that a move in this direction is inevitable. Not only do users expect such services to be developed but the services will also enable public agencies as well as third parties to create important added-value for society as whole.

To enable this type of service delivery in the near future requires a **clear commitment** to put the key enablers in place and to agree on a clear common vision. Government plays an essential role in facilitating the creation of these prerequisite underlying elements and tackling the major obstacles.

In 2010, governments are hard-pressed to make choices about the kinds of mechanisms that enable them to continue to provide access to high-quality and safe services that are cost-effective for both themselves and their users⁷. An adaptation of the Gov 2.0 life events model to government services can reflect both the expectations of users, and resolve a number of the challenges that surround public service provision (for awareness of such challenges, see for example, the Council of the European Union, 2009, and the Fifth Ministerial eGovernment Conference 2009).

Costs and gains: Gov 2.0 is conceived as a means of making government services more responsive and effective and, in parallel, enabling them to 'slim down'; this trend complements the directions taken by other organisations and their use of Web 2.0 technologies, a shift which is transforming both the economy and people's lives. In addition, Gov 2.0 offers the possibility to "unlock the immense economic and social value of information and other content held by governments to serve as a precompetitive platform for innovation" (eGovernment task force, 2010, pxii).

The study had the opportunity to examine provisionally what a shift towards a more modular approach to life events in a Web 2.0 context might mean. It identified clear gains, such as: higher responsiveness to the expectations and needs of citizens as and when they require certain services; fulfilment of policy mandates and coordination on their accomplishment; greater transparency; greater collaboration and cooperation across services, between government and third parties, and between citizens and their government. .

The study explored in some detail the potential costings with regard to life events, platforms, and dynamic public services mediation. A rigorous and in-depth cost-benefit analysis was not undertaken, but should certainly be considered for future possible application.

Three broad possibilities with regard to costings were identified in view of establishing the future scenarios: First, when implementing a finite set of life events, development costs are stable over time. Investment costs are assumed to be reduced over time. Second, the implementation of government as a platform, requires higher investment upfront due to the installation of the platform. The development costs are reduced over time as private initiatives will gradually take over the development. Third, dynamic public services mediation requires a very high investment

⁷ For example, the Council of the European Union, 2009; the Fifth Ministerial eGovernment Conference 2009; COM (2010) 2020 final

budget upfront (since all Member States would need to agree on a semantic model). Over time, however, the development cost would be lower due to the re-usability of the semantic services.

Potential recommendations for discussion

In an information-driven age, the ability of governments to seize the opportunities of new technologies may ultimately spell the difference between success and failure for the public sector. Government will never truly realize the transformative benefits of information technology until government systems, ways of delivering services, and bureaucratic structures are rethought and redesigned to reflect the realities of the Information Age.

Several identifiable next steps are needed at a policy-oriented level in view of establishing the future scenarios for public service delivery. Different suggestions might be borne in mind in this context. They particularly involves a **high-level road mapping exercise and strategy development**.

While it is important not to privilege, at this very preliminary stage, what direction the high-level mapping might take, a number of possibilities can surely be based on notions of strategic management and organisational change (Australian Government, 2010; CS Transform, 2009; 2010). At least twelve possible options for discussion and debate include: making a public declaration on future directions; coordinating leadership and governance; offering guidance for public agencies; offering awards for good practice; opening up public sector information; addressing copyright issues; enhancing information publication; enhancing accessibility of sites and information; ensuring secure use of Web 2.0 tools; ensuring privacy and confidentiality; clarifying ownership or use of publications and data; and – last but not least – “info-philanthropy” (recognition and gifting of voluntary and not-for-profit services).

Other mechanisms which will facilitate and support the process of high-level road mapping and strategy development could practically involve: the identification of various actors and their roles, and the concrete engagement of these stakeholders; an impact assessment; a matching and comparison exercise with activities that are already underway in both Europe and more widely; surveys on complementary topics; a broader exploration of users’ expectations of the life events model in its application to eGovernment services; and a cost-benefit analysis of the work to be undertaken.

Last but not least, two particular questions are of high consideration in respect of next steps to be taken. The first are any legal constraints – such as data protection and privacy – that might have implications for the opening-up of government data and the use of specific types of personal data (whether these exist at a European level or they affect particular Member States). The second is to reinforce the importance of undertaking a rigorous cost-benefit analysis of the gains to be obtained and the potential investments needed for the implementation of a service oriented architecture and development of the open public services and information to enable development, by government and/or third parties, of life events based services that make use of Web 2.0 tools, and the ways in which this should be explored at both a pan-European and country-specific levels.

2 Introduction

This study has assessed and documented a new model of eGovernment service organisation and delivery. The work has been undertaken based on a “life events approach”. The approach started from a user-centric view of people who are faced with various challenging life episodes that need effective solutions.

The study investigated the possibility that “Web 2.0 for government” can support a transition from “Gov 1.0” to “Gov 2.0”. Underlying this shift is the premise that a static, top-down, one-way-fits-all style of approach to public service is now gravitating towards a more connected form of collaborative service delivery model that is tailored to its users’ needs and is “proximity-driven”⁸.

Web 2.0 formed the foundation of this study: it is conceived as enabling the application of radically new models of government services. Thus, the study assessed how eGovernment service delivery can benefit from the features offered by Web 2.0 concepts, tools and platforms to create societal value. Particularly, the proposed platform which is the outcome of this study has implications for the kinds of infrastructure (and its components or “building blocks”⁹) on which the services are constructed.

Web 2.0-enabled life events-based public services are based on an architecture that enables services to have four distinct characteristics: they must be identifiable, composable, interoperable, and re-usable. These four different elements imply a capacity for services to work together easily, and for the services to be based on clear identities and on identity management. Different types of delivery methods for services have been explored with a set of general properties: broadly, they are bundled, integrated, multi-channel, personalised, and pro-active.

The study has therefore analysed both the technology and infrastructure requirements of a service-oriented architecture. Its aim is to enable the achievement of these new service delivery models. The assessment has included the integration of a number of building blocks into various existing platforms, and has explored the decisions and activities needed to be undertaken, as a result, and their possible costs.

The study has explored a potential roadmap towards new concepts and models of service organisation. This service delivery and architecture has been examined from the perspectives of different service providers (in this case, principally governments and private providers¹⁰). The potential that exists for collaborative governance and multi-channel service delivery between public and private sectors has been assessed. The ultimate objective of the resulting architecture would be to provide public services that are easily identifiable, composable, interoperable, and re-usable.

The overall research logic and eight associated research questions of the study were:

- What does a shift from Gov 1.0 to Gov 2.0 imply for eGovernment services?
- What has been the role of Web 2.0 in this transition till now?
- How could future Web 2.0-enabled services be designed, and what could they look like?
- How did the concept of a “life event” approach evolve in relation to this transition?

⁸ Although definitions of “proximity-driven” are not common, in terms of a tool or software it implies the nearness in place, time, order, occurrence, or relationship to the user of that tool.

⁹ The origin of the term building block has emerged from fields related to building, architecture, and design. As a result, in the field of software, a “building block” implies “a component that fits with others to form a whole” (the Free Online Dictionary <http://freeonlinedictionary.com/> (accessed 3 November 2010)).

¹⁰ The role of civic society and semi-public platforms has been explored less than that of the private sector in the context of this study.

- ✔ How can eGovernment service delivery benefit from Web 2.0 and a life events approach?
- ✔ What could be the possible take-up of these services by different user segments?
- ✔ What could be the outlook for collaborative stakeholders' service models?
- ✔ How could a service-oriented architecture be designed to enable these service models?

The questions reflect a number of concerns. They include the history and development of both online government services and the Web and the ways in which they have influenced each other mutually. They focus, as a result, on the practical and applied principles which will need to be followed if policy-makers are minded to orient future directions towards this synergy of Web 2.0 with life events. The growth of the concept of life events is explored as is the question of how it can function in combination with a social and technical orientation towards Web 2.0: it is possible that, in this new vision, the way life events are presented or used may need to be modified or adapted. The resulting observations are concentrated on a "where to from here" approach, and a capacity to sustain the chosen activities over a one to three-year time horizon.

In this final draft report, the eight study questions are reduced to five areas of exploration to which tentative answers are provided:

- ✔ Current situation – what is today's situation from the point of view of government?
- ✔ Current situation – what is today's situation from the point of view of users?
- ✔ Future desired situation – which four life event scenarios might be useful to develop?
- ✔ Future desired situation – would these services be accepted by users, and by whom and how could they be developed?
- ✔ Enabling mechanisms – what architecture would be needed?

2.1 Aims and objectives

The overall objective of the study was to investigate and document possibilities for a life events approach to the provision of eGovernment services, other new and possibly complementary ways of providing services, and the consequences of these for the service architecture. The context of the study was Web 2.0.

As a result, throughout the whole assignment, the study team took into account exactly how eGovernment services might benefit from Web 2.0 features. It considered possible service features such as automatic or on-demand delivery of services; the personalisation of services; the use of social participation techniques (e.g. consultation, petitioning, support networks and community sites); and the use of collaborative production techniques (e.g. crowd-sourcing, expert tools, mass collaboration and joint production of services) that can involve public, private or civic society partners.

The study investigated and documented new methods of eGovernment service delivery that can be provided through these new methods. These new methods are grouped into what is called a life events approach. It covers various types of multi-channel approaches that can be integrated, bundled, personalised, and delivered by governments and by other service providers in a proactive manner.

The study's aims and objectives are illustrated diagrammatically in Figure 1 below. The way in which the study's approach and methods operated are then described in the following section.

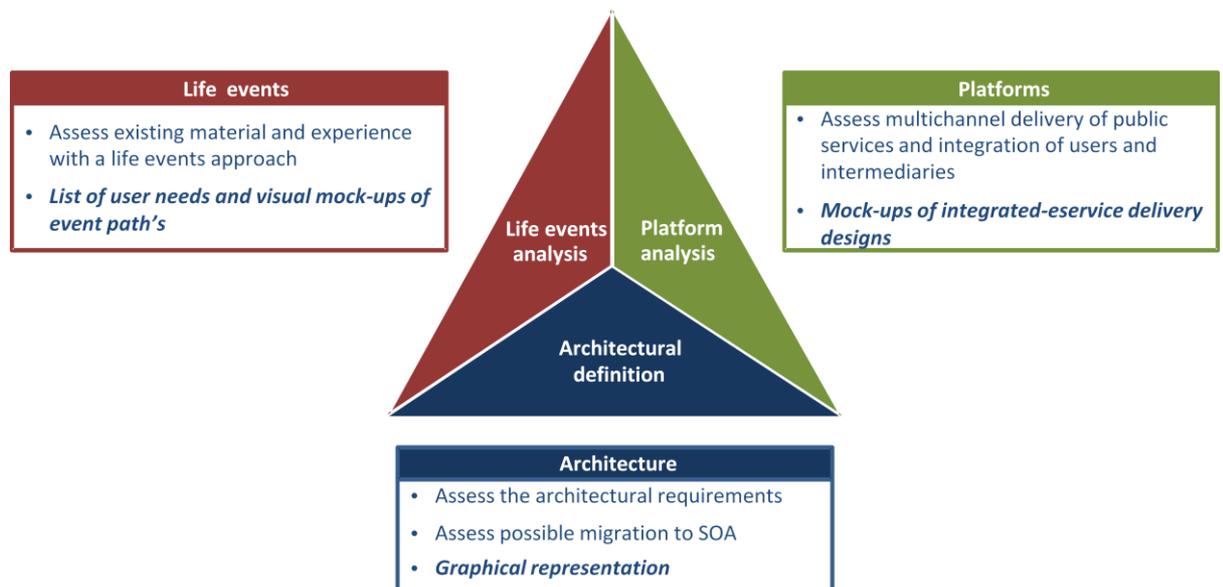


Figure 1: Overview of the study objectives

2.2 Study methods

The study consisted of three main phases which involved an assessment of the life events approach, a proposed platform, and a definition of the resulting architecture. The details of these three phases follow:

- Phase 1: Life Events Analysis.
 - Assess existing materials and experiences with a life events approach
 - Investigate users' needs and behaviour
 - Produce visual mock-ups of integrated service delivery designs based on user-needs.
- Phase 2: Platform Analysis.
 - Assess a multi-channel delivery of public services integrated with the activities of users and intermediaries
 - Analyse the key enablers for the future development of such scenarios.
- Phase 3: Definition of the architecture.
 - Define the benefits of a service-oriented architecture
 - Discuss the key components for such a service-oriented architecture
 - Discuss the consequences and opportunities of a service-oriented architecture
 - Define the migration roadmap towards a service-oriented architecture.

The study therefore had three components: an analysis of existing approaches; the analysis of the potential platform to be used; and a definition of the potential architecture. The approach to the study combined a variety of different research methods used in the three different parts of the study. They involved the following different study methods during each phase of the study:

- Phase 1: An analysis of existing approaches.
 - Desk research
 - User experiments undertaken in a laboratory environment
 - Scenario development.
- Phase 2: An analysis of the potential platform.
 - User panel surveys
 - Interviews with key stakeholders.
- Phase 3: A definition of the potential architecture.
 - Architectural design.

As a result, the study produced three sub-deliverables: a Life Events Report, a Platform Report, and an Architecture Report. In the study's final phase, the findings from all three of these sub-deliverables have been consolidated into a draft final report.

The final stage of the study involved a validation exercise. The study's preliminary findings and recommendations were validated with the assistance of more than twenty experts who met in a final workshop which took place on Monday, November 29, 2010. The experts included representatives from eGovernment departments in a variety of Member States' ministries, responsible agencies, staff members from a number of services in the European Commission, and the members of the study team. The three-hour workshop concentrated in-depth on the whole of the study.

The experts' opinions were sought on four aspects of the study investigation:

- Study's main area of investigation.
 - The state-of-play of the life events approach in the transition phase from Gov 1.0 to Gov 2.0 and beyond.
- Study's findings (which emerge from the use of four separate – although associated – forms of investigation):
 - How do citizens solve life events in the Gov 1.0 reality (findings from a set of user experiments)?
 - What are possible future Web 2.0-based eGovernment solutions (findings from a set of scenarios)?
 - Would the solutions be adopted by the public (findings from a user survey)?
 - Who would deliver the services, and what do they need to make this provision happen (findings from a series of stakeholder interviews and architecture analysis)?
- Study's identification of a possible enabling mechanism
 - A service-oriented architecture to design the technical platform.
- Study's recommendations.

Useful questions were raised throughout the duration of the workshop. In terms of discussion, this concentrated on:

- Clarifications with regard to the methodological approach.
- A potential desire to see an expansion or enlargement of some of the study's experiments and surveys (e.g., to websites in more countries, and with a wider use of languages, and searches by users of variety of languages).
- Institutional, trust, and legal concerns with regard to the opening-up and mashing-up of data (including especially data protection and privacy).
- With regard to potential recommendations:
 - Developing the political will and the associated mandate to progress further with this initiative.
 - Assessing the legal constraints to opening up data within and across the EU27, and data protection and privacy more generally.
 - Undertaking a cost-benefit analysis.
 - Reflecting on the inclusion of life events in an annual eGovernment benchmarking exercise.
 - Creating linkages with other programmes and potential activities (e.g., ISA, EIF, the Future Internet¹¹, smart cities/living labs¹², and cloud computing¹³).
 - Practically speaking: developing a use case or cases which include benefits for citizens, businesses, and governments but which do not use sensitive data and which include events which occur more frequently than once per year.

¹¹ COM(2009)479 final *A public-private partnership on the Future Internet*
lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0479:FIN:EN:PDF

¹² COM(2009)278 final *Internet of Things – an action plan for Europe*
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0278:FIN:EN:PDF>

¹³ Speech 10/986 (2010) *Cloud computing and data protection*. A speech given by [European Commission Vice-President for the Digital Agenda, Les Assises du Numérique conference, Université Paris-Dauphine, 25 November 2010](#)
<http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/10/686&format=HTML&aged=0&language=EN&guiLanguage=en> (accessed 3 December 2010)

3 Findings

Five main results have emerged from the three phases of the study on user expectations of a life events approach for designing eGovernment services. These are related to current perspectives of relevance to governments and to the users of government services; the possibilities that exist for the future provision of services, their potential for design and development, and their potential degree of acceptability to users; and, lastly, the kind of supporting architecture that would be needed.

Each of these issues is treated systematically in each of the following sections. They are structured as an appropriate set of questions and answers:

- Current situation – what is today's situation from the point of view of government?
- Current situation – what is today's situation from the point of view of users?
- Desired future situation – which four life event scenarios might be useful to develop?
- Desired future situation – would these services be accepted by users, and by whom and how could they be developed?
- Enabling mechanisms – what architecture would be needed?

The questions explored in each of the following sections are supported by materials that were first presented in the study's three sub-deliverables. A mapping exercise (see Figure 2 below) indicates the relationship between these findings and the three different phases of the study.

Each main section that follows covers aspects of the current situation; the desired future situation; and the chief enabling mechanism – a service-oriented architecture.

Life events report	X	X		X
Platform report		X	X	X
Architecture report			X	
	What is the current situation of Web 2.0 service provision?	What would future Web 2.0-enabled services look like?	How should these future services be implemented?	Why will these scenarios be developed?

Figure 2, Study deliverables and main research questions

3.1 Current situation

The current situation for both governments and users is described. Complementing this approach is a brief introduction to today's policy situation, by outlining a selected number of the recent, and developing, European policies that can affect the provision of eGovernment services for citizens.

This study has not treated the relevance for its implications of its policy towards currently-sponsored research work on the part of the EC. It would, however, be feasible to explore in greater detail, for example, the possibilities offered by areas of research such as e.g. research on eGovernment under the EU Framework Programme, the Future of the Internet, smart cities, and cloud computing.

3.1.1 Policy overview

As Europe enters the second decade of the twenty-first century, it faces many daunting challenges. It absolutely needs to retain, and improve, its competitive position in the globe. Europe's public services face the difficulty of maintaining the capacity to continue to provide their services. Governments are pressed to make choices about the kinds of mechanisms that enable them to provide access to high-quality and safe services that are cost-effective for themselves and their users (these are all pressures that are highlighted in *EUROPE 2020 A strategy for smart, sustainable and inclusive growth* (COM (2010) 2020 final). Several of the pillars of Europe's recent policy developments point in these directions. **An adaptation of the life events model to government services reflects both the expectations of users, and can help to resolve a number of the dilemmas that surround service provision.**

At the start of this study, it was understood that the EU's general intentions vis-à-vis government and public services were outlined in a number of policy documents. These documents were in many ways the precursors of decisions relating that have now been taken, and which fully support the EU 2020 initiative.

Documents and declarations include the *Post i-2010 Strategy - towards an open, green and competitive knowledge society* in 2009¹⁴, and the Fifth Ministerial eGovernment Conference (2009) in Malmö, Sweden; and the Granada Ministerial Declaration on the European Digital Agenda (2010). They reflect trends in various eGovernment preoccupations about:

- ✔ Governance, effectiveness, and efficiency.
- ✔ Transparency and accountability.
- ✔ A participatory or collaborative approach that involves: third party involvement, user involvement, and user empowerment.
- ✔ More effective use of government information.
- ✔ Streamlining of internal operations.
- ✔ Generating positive social outcomes.

3.1.2 Recent policy developments

For the EU, 2010 is a year of considerable challenge. The Union's new Commission and Parliament, in conjunction with the Council of Ministers of the Member States, are working together to face the socio-economic threats which are affecting the continent and its people. They are doing so by planning using a longer-term horizon of a minimum of ten years which has taken on full-front the challenge of a number of economic, technological, and socio-organisational difficulties.

Their chief aims are to create a Union which renews its competitive advantage, which energises the social commitments of the continent, creates greater efficiency in the public sector, and aims for greater productivity and performance in European society as a whole while at the same time advocating for the enhanced rights of European citizens. These intentions are clearly laid out in *A Digital Agenda for Europe* (COM(2010) 245 final). Tying all these issues together is a view

¹⁴ Council of the European Union (2009) Adoption of the Council Conclusions on "Post i-2010 Strategy - towards an open, green and competitive knowledge society". 2987th Transport, Telecommunication, and Energy Council meeting, Brussels, 18 December 2009. http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/trans/111999.pdf

which enhances the co-ordination and connectivity of a diversity of public and private services. A potential focus would appear to be services for the citizen.

As a result, many of the activities that were anticipated over the last five years can also be foreseen for the next ten-year period are grounded in a set of fundamental and yet very practical concerns. These elements might include building on identity management, interoperability, privacy, regulation, security, semantics, standards and standardisation, and trusted document exchange (see the *i2010 eGovernment Action Plan - Accelerating eGovernment in Europe for the Benefit of All* COM(2005) 173 final). The concentration is on a number of key issues (that are often called “building blocks” by the EC). These are core to ensuring the safety and security of European citizens in terms of society at large, and doing so in a way that may implicitly build (or re-build) the sense of trust among European citizens in the governments that serve them and the services that they need.

Among the key policy documents which reflect these concerns are those related to the Union's EU 2020 initiative called *EUROPE 2020 A strategy for smart, sustainable and inclusive growth* (COM(2010) 2020 final.).

It can be envisaged that all the associated policy developments which support this high-level initiative are likely to reflect a complementary philosophy and rationale. Hence, the EU 2020 initiative includes seven flagship initiatives in total. Four of these flagships were launched between June and end-October 2010. Two of which, the **Digital Agenda for Europe** and the **Innovation Union** in particular, place a serious, and coherent, focus on these core issues.

Other programmes have been launched that bear some relevance for this study: they include the **Interoperability Solutions for European Public Administrations** (ISA), and the concentration on **EU citizens' rights** (*EU Citizenship Report 2010: Dismantling the obstacles to EU citizens' rights* (COM (2010) 603 final)).

Here we outline in somewhat more detail both the Digital Agenda for Europe and the Interoperable Solutions for European Public Administrations.

3.1.2.1 Digital Agenda

In May 2010, the EC issued the Communication on *A Digital Agenda for Europe* (COM(2010)245 final). The agenda is one of the seven flagships of the *Europe 2020 strategic policy framework for smart, sustainable and inclusive growth* (COM(2010)2020).

The Digital Agenda refers to eGovernment services. It specifies the need to develop more effective and efficient interoperable public services. These public services should emphasise open and transparent government and active participation, promote the re-use of public sector information and are thus potentially very important new user-driven service innovations. Among its seven pillars (or action areas), the Agenda highlights several issues which bear relevance to this study. For example, in Key Action 16 – its ICT-enabled benefits for EU society pillar, there is the need to implement fully interoperable eGovernment services at organisational and technical levels including eIdentity (eID) and eAuthentication schemes. In addition, Key Action 3 calls for a revision of the eSignature Directive in 2011 to provide a legal framework for cross-border recognition and interoperability of secure eAuthentication systems. In its interoperability and standards pillar, standards and interoperable systems are promoted. In particular for eGovernment services interoperability should be ensured based on standards and open development platforms. In its research and innovation pillar, standardisation and open platforms for new products and services can be seen.

3.1.2.2 Interoperable Solutions for European Public Administrations

The adoption on June 30 2010 of the ISA work programme allocates €26 million to actions aimed at supporting cooperation between public administrations with a strong focus on interoperability and re-use. The programme's overall aim is to overcome electronic barriers between Member States and to avoid any duplication of effort among the initiatives undertaken. Actions are planned that will promote and facilitate the exchange of information between administrations, agreement on common frameworks and ICT architectures, and the support of services that enable faster development of cross-border public services through the desired collaboration between public administrations. Legislation, greater awareness-raising, and "best practices" are to be enhanced through the same mechanisms. Such activities will surely be

facilitated by the eventual formalisation of the European Interoperability Framework for European Public Services 2.0.

3.1.3 Situation from the point of view of government

Traditionally, on Web 1.0 public service websites, life events formed part of a more static approach to the internet. The prevailing view of how to implement the life events model in terms of eGovernment has been based on a top-down approach. Governments tended to organise their on-line presence using life events that were selected and designed in a hierarchical manner by public administrations. Firstly, the events tended to be restricted to those occurrences which – almost by definition – do not occur so often to citizens (such as birth, death, divorce, or moving house). Secondly, they did not necessarily reflect citizens' actual information and service needs.

The concept of life events as a way of organising government provision of information and services was very popular in the early days of eGovernment, e.g., in Australia and the UK.

In 2003, the IDA Report 19 on "Harmonizing 'life events' online across Europe" (European Communities, 2003, p4) stated that:

"Europe's public administrations are increasingly defining e-government services around 'life events', i.e. important stages in a citizen's life, such as school, marriage, or buying a property. (...) 'Life events' package government services which are usually provided by multiple government agencies around a subject that makes sense to the citizen. The IT systems of the participating government agencies then co-operate (i.e. interoperate) for the seamless delivery of the e-service."

Furthermore, in the EC's Communication on "The Role of eGovernment for Europe's Future" (COM(2003) 567 final) the life-event paradigm was linked with the concept of a single point of contact:

"One-stop shopping portals are gradually becoming the norm for citizen services. A 'life-event' orientation is often offered on the portal, bringing together all relevant information for citizens related to a specific stage in life."

At the same time, it was noted that "*such citizen portals are becoming more sophisticated by adding electronic identification, electronic payments (which raises questions about the choice of standards) and increased interactivity*" (COM(2003) 567 final). Examples referred to included the HELP citizen portal of the Federal Chancellery in Austria (<http://www.help.gv.at>).

By 2010, many government websites and portals in EU Member States have incorporated life events as a basic organising principle. European examples include those of such countries as Belgium, Ireland, Malta, the Netherlands, Slovenia, and the UK. Examples in countries outside the EU can typically be found in Australia, Canada, and the United States of America.

Creating these kinds of portals has been associated in the international context with approaches to Open Government and to open data. These approaches can permit the greater availability of government data for re-use and exploration by third parties.

Both the one-stop shop concept of eGovernment portals and life event-based taxonomy models have been embraced in Europe as important ways of organising content and providing government information and services. These approaches were thought to fit well with citizens' mindsets and patterns of internet search behaviour. From a customer's or citizen's perspective, it was thought that such an approach would simplify any need to abstract the multiplicity of public agencies that might be involved in the delivery of services related to specific life events or circumstances.

Hence, any life event, such as the birth of a child or the creation of a business, may require interaction with several government entities across multiple levels. Supporting interaction for these life events is a critical stage in the enabling of better, more effective government services.

In Europe, the life events approach is exemplified by the approach developed and piloted in the Netherlands from 2008 onwards by the Dutch Ministry of Internal Affairs. The Dutch case demonstrates the value of a life events model of public service delivery. The Dutch approach intends to improve and measure the quality of public service delivery based on a customer life events model, multi-channel delivery, and the quality guidelines of the eCitizen Charter (Burger Service Code <http://www.burgerlink.nl>) (Kanne et al, 2009).

3.1.4 Situation from the point of view of users

From a citizen's perspective, there are several shortcomings to today's eGovernment services. Citizens are also acting in very different ways with the kinds of social media applications that are at their disposal.

3.1.4.1 Shortcomings in current eGovernment services from the users' perspective

The shortcomings identified in eGovernment services from a users' perspective as they currently stand can be classified in various ways.

The user experiments undertaken in this study identified at least three limitations of current governments' provision of information. First, the information that is provided on government portals can be difficult to find. Second, navigation through the pathways established on the government portals searched is not always optimal. This difficulty makes it, third, difficult for citizens to find the information that is needed in relation to a life event (a specific problem) that has to be resolved. Hence, information provision is not optimised: users cannot find the information quickly through using different paths.

Based on the study results, a first conclusion is that there are indications of an insufficient implementation of the life events approach. There is evidence that – even though web content may be organised on the basis of a life events taxonomy – it is not always supported by a comparable sophistication of service provision. For example, one UK-based report indicated that government web sites provide insufficient options for people who face some of the most stressful events in their lives (Bawa, 2008).

Second, citizens have many needs that occur on a more regular basis and take place in between the very major life events. Most administrative obligations (or rights) to be fulfilled or needed by citizens can be of high impact to them but are usually not a regular part of citizens' daily lives or businesses' corporate lives.

Third although of high value, using only a top-down approach to a one-stop shop and life event-based models of public service delivery does not provide sufficient solutions to incorporate the variety of needs experienced by citizens. Despite interesting examples uncovered by the desk research, the top-down approach appears to have not yet adapted widely to the changing ways in which citizens try to fulfil these needs.

This study therefore looked into four specific cross-border life events to investigate these kinds of observations. They were based on the currently available eGovernment services and information online. They represented, on the one hand, occurrences that can arise in the lives of modern Europeans and, on the other, life events that are being increasingly highlighted in EU policy materials, being tested in a variety of projects and studies, and episodes experienced by various Member States.

Practically speaking, the set of user experiments took place in the UK at OxLab in Oxford. One hundred and thirty persons participated in the experiment, which they were given one hour to complete. Each subject was provided with four scenarios. Each was asked to 'think themselves into' the fictitious situation. The scenarios described different life events: all in cross-border situations. More detail is provided on these in Annex 2, and the scenarios are described in greater detail in section 3.2.1 of this report.

A number of hypotheses about users' needs and behaviours were tested in this set of user experiments. They detected and analysed a range of users' behaviour in solving and resolving the challenges faced when dealing with these four different life events.

The key preliminary conclusion from the user experiments was that people have a disaggregated, search-oriented response to life events. They work out specific information items that they need and look for them, and find them in a wide variety of sources through the use of a broad range of strategies. They use search engines and specific search terms and often find information from non-governmental sources. When people are left to employ these strategies freely by themselves, they tend to find information more quickly and more likely on non-governmental websites.

A renewed interpretation of the life events approach would involve a more bottom-up, responsive, interactive and deductive model, in relation to events that are becoming increasingly

common for all Europe's citizens. Such a user-centric concept of life events would be based on the real, documented needs of citizens that emerge from the different roles that they play, at different moments in their lives, and as they are faced by different life situations.

3.1.4.2 How users are using Web 2.0 applications today

Web 2.0 applications facilitate mass participation and collaboration in terms of creating, editing, ranking and distributing content. There are many ways to categorise, and distinguish among, different types of Web 2.0 applications. Classification itself is difficult because Web 2.0, by its very character, is composed of many hybrid forms, tools, and technologies. Web 2.0 is more often increasingly referred to as "social media".

A definition of the Web 2.0 (social media) applications is useful in the context of users' expectations of a life events model of eGovernment services as is an explanation of how citizens actually use these applications.

First, academics Andreas M. Kaplan and Michael Haenlein (2010) define social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated content".¹⁵ They have created a classification scheme that identifies six different types of social media. These are: blogs and micro blogs, collaborative projects, content communities, social networking sites, virtual game worlds, and virtual social worlds. Social media can take many different forms, including Internet forums, micro blogging, pictures, podcasts, rating, social blogs, social bookmarking, weblogs, wikis, and video. The technologies involved include, to name but a few: blogs, crowd-sourcing, email, instant messaging, music-sharing, picture-sharing, vlogs, Voice over Internet Protocol (VOIP), and wall-postings. Many of these social media services can be integrated by the use of social network aggregation platforms like Mybloglog, Plaxo, and Plugged.it.

Second, Australia's governmental services identified a broad range of Web 2.0 tools which can serve citizens in terms of their use of eGovernment services (Information Victoria, Australia, 2009)¹⁶. The classification takes as its starting-point what people are actually doing with the various tools:

- Information sharing: e.g., blogs, YouTube and the micro-blogging platform of Twitter;
- Content co-creation and collaboration: e.g., wikis (such as Wikipedia, a typical example of crowd-sourcing);
- Online social networking: e.g. Facebook, LinkedIn, MySpace, and virtual social worlds like Second Life;
- Re-use/re-mix of information across media: e.g., mash-ups that incorporate text, maps, and video;
- User created navigation and categorisation of information: e.g., folksonomies, social tagging or bookmarking.

3.1.5 Shifts from Web 1.0 to Web 2.0 and from Gov 1.0 to Gov 2.0

This first phase of the study enabled the observations that there is definitely a shift that is taking place along two axes: changes that are taking place in the technologies on offer – from Web 1.0 to Web 2.0; and changes in the model of Gov 1.0 to Gov 2.0.

As a result of comparing the "connecting information" model of Web 1.0 to the "connecting people" concept of Web 2.0, it can be observed that – as a result – time, place and authority are all altering. There are distinct changes in the ways in which people search in terms of their need for convenience and connectivity. These are shown in the figure below.

¹⁵ Andreas M. Kaplan and M. Haenlein, "Users of the world, unite! The challenges and opportunities of social media", Business Horizons, 53 (1), 2010.

¹⁶ Information Victoria, Australia, "Web 2.0: The New Tools for Democratic Conversations – A snapshot of Initiatives in Government," , 2009. <http://www.egov.vic.gov.au/government-2-0/>

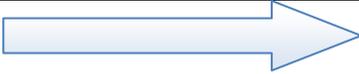
Web 1.0 Connecting information		Web 2.0 Connecting people
➤ Read-only	Time-shifting Place-shifting Authority-shifting Convenience and Connectivity	➤ Read-write
➤ Informative		➤ Participatory
➤ Published content		➤ User generated content
➤ Silo mentality		➤ Collaborative
➤ Platform-dependent		➤ Multi-channel

Figure 3, The shift from Web 1.0 to Web 2.0

From a government services perspective, there are similar shifts along the four underpinning dimensions of the operating model, service delivery, performance, and forms of decision-making. Gov 2.0 is expected to operate in a more networked, flexible, and collaborative manner. Its new models of service delivery will become more personalised, based on individuals' choice. How performance is undertaken will become more transparent and certainly more outcome-driven. Lastly, decision-making will be more participative.

Dimension	Government 1.0	Government 2.0
Operating model	<ul style="list-style-type: none"> • Hierarchical • Rigid 	<ul style="list-style-type: none"> • Networked • Collaborative • Flexible
New models of service delivery	<ul style="list-style-type: none"> • One-size-fits-all • Monopoly • Single channel 	<ul style="list-style-type: none"> • Personalized • Choice-based • Multi-channel
Performance-driven	<ul style="list-style-type: none"> • Input-oriented • Closed 	<ul style="list-style-type: none"> • Outcome-driven • Transparent
Decision-making	<ul style="list-style-type: none"> • Spectator 	<ul style="list-style-type: none"> • Participative

Figure 4, The shift from Gov 1.0 to Gov 2.0

3.2 Desired future situation

To move from the 2010 status of governments' use of a life events model in order to provide their citizens with services, the study identified the importance of moving towards a specific vision of the future. Ultimately, this vision is laid out in Figure 5, The journey towards an "atomic" government model.

From a technical perspective, the underlying architecture needs to become more modular. The structuring of information in terms of life events and more modular architecture need to be brought together. Government portals need to be adapted in a more coherent way towards a life events approach.

To explore the possibilities for such a shift to take place, the study team designed a set of life event scenarios in the format of visual mock-ups of a possible implementation of the services associated with a specific life event. These scenarios were designed based on the trends in terms of the use of Web 2.0 environments of online users and the fit of Web 2.0 tools to the characteristics of the type of tasks to be carried out in relation to the life event. A content affinity

matrix¹⁷ was created that enabled the development of these mock-ups. The mock-ups were envisaged as being useful close to the users, and their use in users' homes and/or residences could certainly be considered.

These mock-ups were trialled in two ways. On the one hand, the viability of the use of these life events scenarios and mock-ups was tested with a group of Internet users. On the other hand, the implications of potential implementation of these scenarios was investigated in a set of interviews undertaken with key stakeholders. The stakeholders included eGovernment experts, public agencies, and private sector players.

3.2.1 Four potential life event scenarios

The study explored new service delivery models and architectural requirements through the lens of four concrete life event cases that respond to users' needs.

This section describes briefly the four life event scenarios, and indicates the general trends in preferences expressed by both potential end-users of the services, the service providers, and industrial stakeholders.

The four separate life events that were selected for study formed the practical backbone of the study. The four life event scenarios were:

- Scenario 1: a European citizen travels to a neighbouring Member State. He or she has a car from which the valuables, (e.g. money, identity papers, flight tickets) are stolen.
- Scenario 2: a European citizen is about to study abroad. He or she prepares to follow a study programme in another Member State.
- Scenario 3: an employee of a European firm is about to be sent to work in another Member State.
- Scenario 4: a European citizen is about to travel abroad and a pandemic flu has broken out massively throughout Europe.

The four cases were selected for a number of reasons. Overall, the cases were not single, isolated life events: rather, they were composed of a bundle of activities, actions, and needs. Each case involved the need to use multiple services in a cross-border setting. Each event was composed of a number of different components. They were designed to respond to a set of user needs that existed in two sets of circumstances. The two axes of the life event settings were: importance and urgency.

The mock-ups formed the basis for the research undertaken in the second phase of the study. The approach was later transposed into a service-oriented architecture.

3.2.2 How the life event scenarios would be accepted by users

The first phase of the study concentrated on the life events approach and citizens' current experience of exploring government portals. The findings which resulted were further developed and tested in a second phase of the study.

A user survey was undertaken to test the potential take-up of the proposed services, and to provide user feedback. New e-Service models were developed through a creative design process.

These new services were based on Web 2.0 applications: their aim was to respond more effectively both to the needs of both end-users and the objectives of Gov 2.0. The new models were developed based on a set of story lines and animated designs (mock-ups and a video) that portrayed novel Web 2.0 based eGovernment applications.

During the second phase of the study, mock-ups of the four life events applications were subject to two forms of "reality check"¹⁸. Both checks were essential. They constituted two sides of a

¹⁷ These matrices have been developed by one of the project partners, DearMedia (Belgium). They are a problem-solving tool that aims to prioritise decision-making: they are used in circumstances when designers are aiming to ascertain the most effective tool or application to use in a particular context or circumstance. For example, what kind of tool or application works best in someone's office, someone's homes, on the move, or in an emergency situation.

¹⁸ An assessment that determines if a person's circumstances or expectations conform to reality: Adaptation of definition provided in the Free Dictionary Online <http://www.freeonlinedictionary.com/> (accessed November 3, 2010)

coin of potential benefits that resulted from the use of the applications. These were, first, benefits for end-users and the extent of the application' potential take-up and, second, benefits and interest for public and private providers.

The reality check questions posed to the external respondents were:

- To what extent are the four scenarios seen by end-users as beneficial? What would be the likely take-up of such scenarios?
- How can the applications be organised on the platforms which are provided by governments and other service providers?

The second phase of the study also involved data gathering and analysis. The two methods of data collection for the reality checks were an online user survey and a series of in-depth interviews with external respondents:

- The online survey was conducted in three Member States (Austria, Netherlands and Sweden) based on the four scenarios ("life events"). The questions tested users' responses to a potential integration of user-centric concepts in a multi-platform, multi-channel environment. This survey was deliberately targeted as a high number of "advanced" users of Web applications.
- In-depth interviews took place with key stakeholders. They focused on the provision of the kinds of services under development, and the degree of collaboration needed to produce these services by private sector players. They helped to develop and test the possible collaborative service delivery models. Key enablers and drivers as well as requirements and potential obstacles were inventoried and analysed.

3.2.2.1 General results from the online user survey

The Gov 2.0 applications were presented as a set of life events applications, each in a single application.

Overall, there was a **positive tendency towards the adoption of the life events scenarios**. Measurement of adoption intention and perceptions of added-value and improved ability to access government information and services all indicate that most people are willing to use, and see value in using, the life events concepts presented to them by means of the animated video mock-ups of service applications.

Generally, the four life events scenarios were well accepted. Some differences do, however, exist in the potential degree of acceptance of each of the four case-related applications. The findings are confirmed that the "stolen valuables" and "working abroad" life events applications had adoption scores that were significantly higher than the scores for the other two scenarios.

There appeared to be a range in acceptance or willingness to adopt according to age, gender, and certain individual psychological differences. Of some influence too was the degree of trust in the Internet and trust in government.

Country differences were limited. Specifically, the younger student group was more critical of the novel applications presented than was their sample counterpart of self-employed people. Overall, the impact on adoption intention of users' individual characteristics – such as their orientation towards innovation and trust in the Internet – was considerable.

Several benefits of adopting new Gov 2.0 life events-based applications were presented to the survey respondents. Those that were cited by them most often were: **time savings, flexibility, convenience, simplified service delivery and being better informed**. Two-thirds of the students and professionals questioned perceived these to be value-added aspects of the possible new Web 2.0-based ways of (public) service delivery.

Users' requirements differed from one application to another. Generally, however, the most essential features were perceived by the respondents as twofold. They were either related to **user service friendliness** or to **convenient information provision**. In the first example, this meant that all formalities – whether available from public or private service providers – could be

handled using a single application¹⁹ and guidance was to be provided pro-actively throughout all the necessary actions. In the second example, it implied that personalised information was available, and government information and services were ready-to-hand.

3.2.3 General results from interviews with key stakeholders

The interviewees responded favourably towards the scenarios that were presented. The scenarios were deemed useful and important offerings. It was thought that they could result in clear benefits for citizens and businesses as end-users, and also for public administrations and the private sector. Web 2.0 was viewed as an important driver for bringing about these benefits. **Technically, the development of such scenarios is already possible.**

Perceived barriers and opportunities

There was a single most important reason why it was expected to take a number of years to develop these future services. This stems largely from the fact that the public sector has a number of steps that it will need to take in order to put in place the appropriate conditions and infrastructure. The steps would involve **opening up public data, providing accessible and re-usable public services within a service-oriented architecture, as well as putting in place an appropriate legal framework** (in relation e.g., to data protection and privacy), **standards** (including general acceptance of electronic documents and what these entail for authentication (e.g. eSignature, identification)) and **a cross-border orientation**.

Government was seen to play an essential role in facilitating the creation of these prerequisites. Taking this action will involve addressing a very important perceived obstacle: namely, back-office integration in the public sector – not only within single countries but also across borders. In other words, **interoperability is an essential enabler for such future eGovernment services.**

From a business perspective, the development of new services by the private sector, based on re-usable public services and data, requires a clear **economic incentive**. **A low threshold to accessing and using public services** to create new value-added services is important to make this a reality.

Businesses also expected that the demand for Web 2.0-enabled services that provide **a complete handling of an 'event' or activity** will arise in the near future.

Finally, leading by example, government should aim to develop basic re-usable services that are both attractive for the private sector to build on and end-users to take up. Facilitating this development may lead to **more demand for these services, build up political commitment, and showcase a clear business case on which the private sector can collaborate.**

3.2.4 Evolution of the life events concept

Generally, phase two of the study allowed the study team to conclude that a service-oriented architecture is able to respond to the need for an atomic, collaborative, multi-platform, multi-channel service and information provisioning. It indicated that such an architecture model would enable the provision of services that could be in line with the life event scenarios.

This second study phase enabled an overview of the ways in which both providers and users might make progress together on a journey towards the atomic government model that is foreseen. Government service provision shifts from being “monolithic” and closed, through a more modular approach, towards a more “atomic” and open approach. It does so in parallel with the trend among Web applications to shift from a top-down approach to a more bottom-up approach, and eventually to a much more distributed framework for both applications and data.

Figure 5 indicates the various Web-based applications that can be used facilitate the coherence and consistency of these combined approaches towards a constructive method of governmental service provision.

¹⁹ The form of single application could be related to the life events approach.

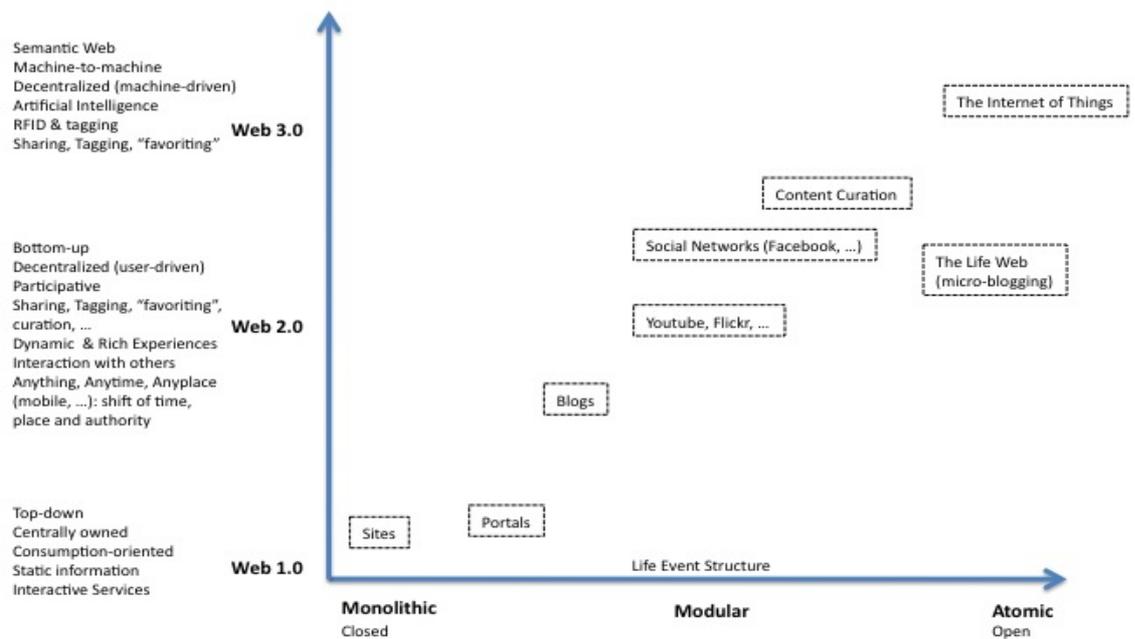


Figure 5, The journey towards an "atomic" government model

Today, most governments that have embraced the life events approach have done so by providing a government portal with a grouping of links to services and information based on specific life events. This study shows that there are mainly three general trends that call for the evolution of the life events concept:

- A multi-channel approach and user proximity
- Third party involvement
- Atomic (open) service provision

Users of online services want to use services that provide them with a full case-handling in an efficient and effective way, making use of different channels in their own proximity²⁰. The online services developed by the private sector deploy the different Web 2.0 tools that are available (and are being constantly developed) in order to provide the users with the kind of value-added experience that they are seeking. In fact, private sector initiatives (e.g. Google or Facebook) function based on a sense of nearness to, or fit with, the user's needs.

It is therefore not unexpected that the Malmö Ministerial Declaration on eGovernment²¹ calls for eGovernment services that will cater for different needs of users to be served by inviting third parties to collaborate on their provision. Third party involvement can thus be key to delivering higher value to society.

However, in order to enable such an approach, governments need to open up. On the one hand, they need to open up their data, in accordance with the Public Sector Information Directive, (L345/90, 2003)²². On the other, they need to move from a monolithic and closed approach to a more open form of service delivery (that involves government providing open and re-usable life event-related services). Providing re-usable services, that third parties can

²⁰ These channels need to be near to ('in the proximity of') the users: in the place they are, usable in their timeframe, and have some form of direct relationship with them. The availability of such channels in the users' own homes can also be important.

²¹ Fifth Ministerial eGovernment Conference 2009, 19-20 November 2009, in Malmö, Sweden.
http://ec.europa.eu/information_society/activities/egovernment/events/past/malmo_2009/index_en.htm (accessed 3 November 2010)

²² L345/90. Official Journal of the European Union. 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information.
http://ec.europa.eu/information_society/policy/psi/docs/pdfs/directive/psi_directive_en.pdf (accessed 3 November 2010)

integrate or mash up into their own new form of service delivery, requires an open, more modular, or even atomic approach²³.

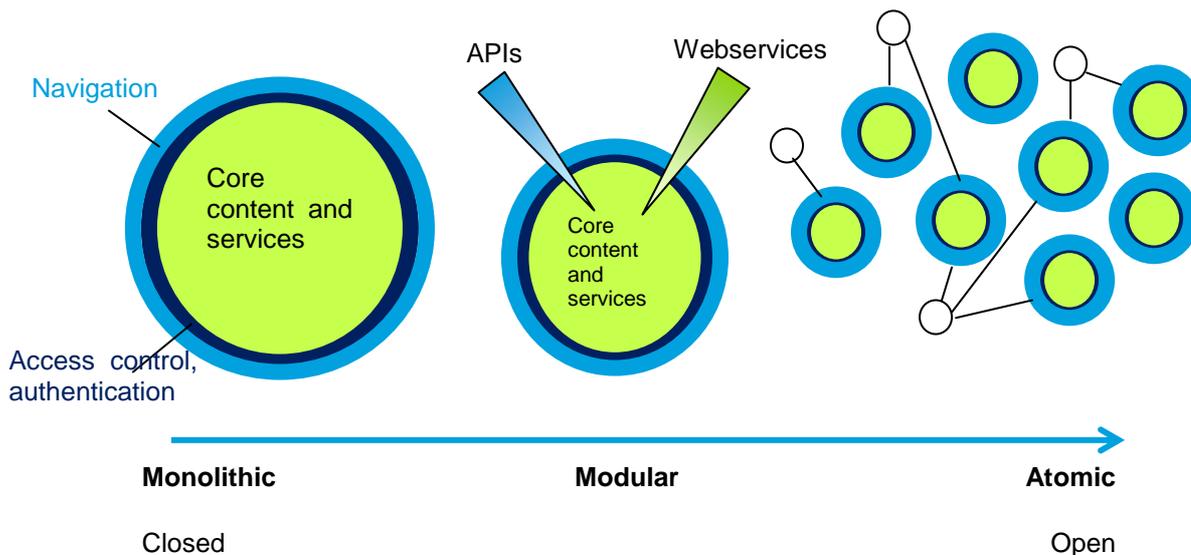


Figure 6, Evolution of eGovernment service provision based on the life events concept

In a monolithic and closed setting, governments provide their core content and services themselves: they control both access and authentication; and they set up a navigation path for users to find the content and services on the site or portal. Today, this all-encompassing approach to service delivery has led to a situation in which many administrations are duplicating the development of specific service functionalities; similarly, content and services are generally neither open nor possible to re-use.

The onset of Application Programming Interfaces (APIs) and Web services has provided the possibility to open up content and services in a more modular fashion such that they can be used or re-used in new settings.

The next evolution in online services is to provide separate information or services ‘atoms’ that are made openly available and can be re-used and mashed up. This will enable third-party collaboration and will facilitate services when and where the citizens or businesses need them.

In this setting, government would still control access and authentication. However, it would open up its services. Thus, the services would be available for navigation based on search, recommendation, curation²⁴, and tagging. They would also be available for third party use in any newly developed user-centric services. This shift reflects an evolution of the life events approach as it is being implemented today: it means that both government and private services can be provided in combination based on a life event situation.

The stakeholders interviewed pointed out that interoperability between administrations within Member States – as well as cross-border – is an essential enabler to achieve the scenarios that are based on this renewed life events concept.

²³ Mashups are a notion that has developed in combination with advances in Web 2.0 applications. The term originated in the music field, but has been adapted to a much wider social setting. A mashup is generally either an application or a web page which has used a combination of data, functionality and/or presentation (often from several sources) so as to create a new set of services.

²⁴ Curation originates from a cultural background common to archives, libraries, and museums. In digital terms, it implies the archiving, collection, maintenance, preservation, and the original selection of materials that are subject to these processes. The procedure is intended to be applied to the entire life cycle of the software or applications.

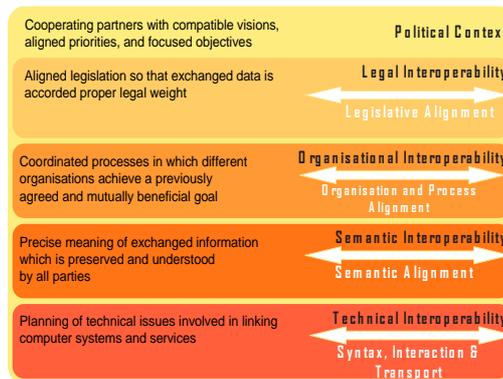


Figure 7, European Interoperability Strategy :five levels of interoperability proposed²⁵

Interoperability can be achieved on different levels. As identified in the study on the European Interoperability Strategy (EIS), interoperability is relevant for the EU on each of five levels: the political, legal, organisational, semantic and technical levels (see Figure 7). All these aspects are important: they are closely aligned with the feedback received from the study's stakeholders.

Of particular importance for this study is interoperability at the technical level. Enabling an atomic delivery of services requires a framework that establishes governance for the technical interoperability of service atoms. The service-oriented architecture paradigm is best suited to support this type of interoperability. The following section provides more detail on a potential architecture for the provision of such interoperable and re-usable eGovernment services.

3.3 Enabling mechanisms

A **service-oriented architecture** was strongly supported by the stakeholders as key to making possible the proposed scenarios based on interoperable and re-usable eGovernment services.

It has been suggested that a service-oriented architecture is the most effective underlying paradigm with which to begin to roll out eGovernment services to be used in cross-agency and cross-border situations (United Nations Development Programme, 2007). The advantage of a service-oriented architecture is that it defines the outcomes and needs in terms of services, by acting as:

“a service platform consisting of many services that signify elements of business processes that can be combined and recombined into different solutions and scenarios, determined by business needs”. (Lallana, 2008)

Today, many legacy systems that continue to operate within government services need to be brought together and integrated. Ultimately, a service-oriented architecture is generally considered the most appropriate solution to do this.

To understand this shift towards a service-oriented architecture, several forms of assessment are useful. Each of these elements is dealt with in further detail in this section.

3.3.1 Definition of a potential architecture

The third phase of the study focused on the potential architecture to be used to underpin the required platform. This study phase addressed such elements as: the benefits of service-oriented architecture; a target service architecture; the implications and the opportunities posed by the choice of a service-oriented architecture; a roadmap for migration towards a service-oriented architecture; and some commentary on the resources required to establish such an architecture.

²⁵ Proposals for a European Interoperability Strategy were outlined in late 2009 under the aegis of the former European Commission Interoperable Delivery of European eGovernment Services to public Administrations, Business and Citizens (IDABC) programme

This study phase investigated the technical feasibility of the approaches and models specified in both the first and second phases of the study. It presented a description of the high-level architecture needed for future eGovernment service delivery. An assessment of that architecture was undertaken. It also described a potential roadmap for governments which are migrating their eGovernment service delivery towards a service-oriented architecture.

3.3.2 The benefits of service-oriented architecture

Government institutions across the world, at national, regional, and local levels, are significant consumers of technologies. Governments provide services to businesses, citizens and to other government services. Consequently, systems need to be in place to share data effectively between agencies and between the public community comprised of both citizens and businesses.

Typically information technology use in government institutions²⁶ has been built around the silos created historically and organisationally by those institutions. For different government organisations, the interoperability and exchangeability of information have tended to be an afterthought. Concerns about service-orientation have also been neglected. As a result, government institutions and agencies have often structured information in separate locations and categories which have reflected their agency-specific objectives. The more that institution-specific silos are created, the greater are the integration problems that have to be overcome at a later stage once institutional decision-makers decide that they need to communicate with each other (or with other user communities).

The **benefits** of a service-oriented architecture are that its services can be re-structured rapidly, and its business processes re-configured: this leads ultimately to greater organisational agility. These applications can be developed and delivered faster than were traditional software applications when they were under development. This increase in speed is due to a variety of factors. They include: the sharing of services, service composition, the wrapping²⁷ of the functionality of legacy assets, and their provision through web services.

These benefits of service-oriented architecture imply that it is **particularly suited to assist government institutions, agencies, and services** in three ways. It can permit governments to:

- ✔ Handle the obstacles that exist to the potential implementation of new kinds of systems.
- ✔ Modernise their business architecture, integrate agency service delivery, and share information across organisational boundaries.
- ✔ Reduce costs by consolidating redundant applications, leveraging the benefits of existing applications, re-using application functionality, and enhancing functionality.

3.3.3 Target service architecture

In this third study phase, four steps were used to develop a target service architecture. First, an analysis was undertaken of the architectures that are currently available in the EU and the different Member States. Second, an architecture was derived that needs to be in place in order to execute the four “life events approach” scenarios that were developed. A third step consisted of interviewing industry experts on their views about both eGovernment and service-oriented architecture. Fourth, several posts were launched on social media websites (such as linkedin.com) to reach out for feedback from a larger potential community.

Based on the analysis undertaken in this third phase of the study, a number of key architectural building blocks were identified²⁸:

²⁶ Here, the term “institution” is used; however, other forms of organisation can also be anticipated. In the study, no assumption was made with regards to whether a government institution (at either supra-national, national, or regional/local level) provides its services, – and the associated information, – directly or indirectly. Examples of such service providers (these could be, for example, an agency, contractors, or sub-contractors or – as is increasingly the potential case – via non-governmental organisations, civic society organisations, volunteers or citizens themselves. Hence, while the term “institution” is often used, other forms of organisation can also be assumed.

²⁷ In software terminology, “wrapping” implies that old code (such as legacy code) is surrounded (or “wrapped”) with a newer environment or code that can bring it up-to-date in terms of its usability.

²⁸ An in-depth exploration of each of these building blocks is located in Section 4 of the Phase 3 Architecture Report of the study.

- ✔ Services in an EU reference architecture
- ✔ Dynamic service composition
- ✔ Dynamic service discovery
- ✔ Semantics of data
- ✔ Identity and access management
- ✔ Rules and regulations relating to data services
- ✔ Cloud computing.

An overview of these many building blocks was represented in graphic format in the figure below.

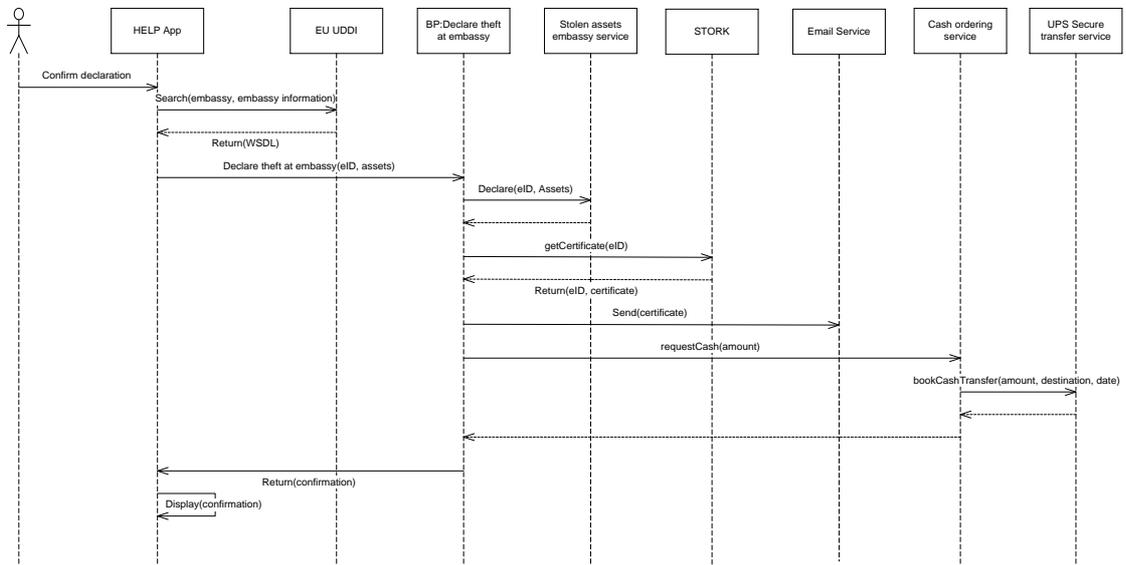


Figure 8, A representation of the building blocks as part of a service²⁹³⁰

Each of these building blocks is considered to form part of an eventual “blueprint” (or guide) for the target service architecture. The blueprint (see Figure 9 below) describes a four-layered approach to enable governments to provide public services through electronic means.

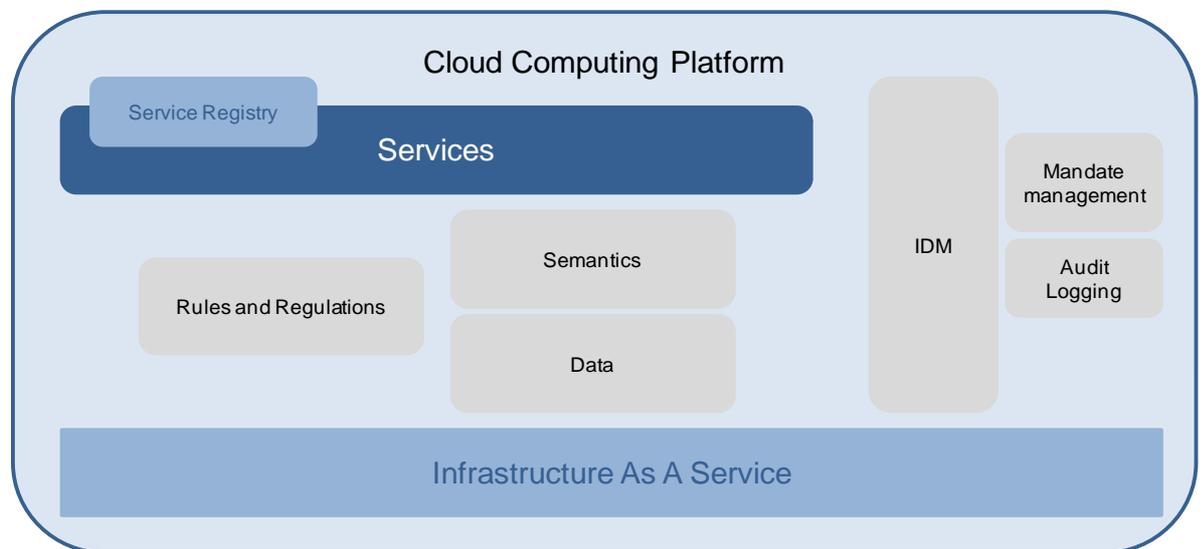


Figure 9, Blueprint for the building blocks of a target service architecture

²⁹ In this figure, HELP.app stands for help.app, an application that helps users to obtain technical support to their technical questions through a portal.

³⁰ All other abbreviations are included in the abbreviations sections at the start of this final report.

The key architectural building blocks of the blueprint are described in terms of the layers involved. The bottom layer shows infrastructure as a service (often abbreviated to IAAS) which enables a flexible and scalable platform. On top of the IAAS layer, a rules and regulations model operates which encapsulates the legacy systems and the laws. Next, open data is presented. On top of that data is a semantic layer. The rules and regulations, open data, and the semantic layer are all made available through services. Services can be located through a service registry that enables dynamic service discovery and composition. Identity management (shown here as IDM) and security are illustrated as vertical pillars. This vertical element indicates that these two applications are needed at all the four layers from the cloud to the service registry. In the security pillar are located components such as audit logging and mandate management.

All these components are located in a cloud platform (which consists of a mixture of services that are both private and public). The platform will reduce hosting costs and enhance the agility of the operation and the sharing of services.

3.3.4 Implementing a service-oriented architecture

Implementing a service-oriented architecture has four main implications. They relate to the setting up of registries and the creation of a universal description, discovery and integration (UDDI) registry, the creation of identity and access management, a sense of trust in the various transactions, and decisions about where precisely to invest.

- ❏ **Create a central or federated service registry:** A central service registry at EU level would be hard to achieve from both organisational and legal perspectives. Integration among the various registries is therefore key to improve the interoperability and re-use of services. This central or federated registry should be based on a platform-independent UDDI. UDDI is a type of registry. Its primary purpose is to represent information about web services. It describes the service providers, and the services that providers offer. Such a registry is needed in order for users to discover services.
- ❏ **Create identity and access management:** To establish trust in electronic transactions in general and eGovernment in particular, an electronic identification system is needed at national or even supra-national level. For example, while most European Member States have their own electronic identification system, there is still a need to allow for the existence of a federated architecture on a supra-national level.
- ❏ **Create a sense of trust in transactions:** Transactions cannot occur without trust. To guarantee trust in transactions there is a need for both a technical and a business solution.
- ❏ **Consider carefully where to invest efforts:** Governments should consider carefully, according to their priorities, in which services they want to invest their efforts.

3.3.5 The opportunities offered by a service-oriented architecture

Various opportunities exist in terms of making progress with regard to the possible implementation of service-oriented architecture, and especially an enhanced collaboration between the public and private sectors.

- ❏ **Providing a service registry:** One of the key components in a service-oriented architecture is dynamic service discovery. To enable this, it would be possible to install e.g. a supra-national wide service registry as a proof of concept. Such a service registry could enable the re-use and discovery of various services.
- ❏ **Providing services by local authorities:** In order to enable local authorities to develop re-usable services, a vision, principles, methodology, and standards need to be set out in a reference framework.
- ❏ **The role of open standards:** A definition of open standards might enable a wide variety of users to use the standards needed to develop software free of charge.
- ❏ **Better collaboration between the public sector, private sector, and civic society:** Governments are not able to provide every single, potential service that citizens might desire. However, by putting key services in place, governments can outsource the partial provisioning of services to private entities or to civic society. By doing so, governments could then focus on their own priorities. This would enable the private sector (and civic society, where appropriate) to provide end-services to Europe's

citizens who are, in turn, composed of both public and private services. Such an initiative would advance considerably the notion of the government as a one-stop-shop.

3.3.6 Roadmap of migration to a service-oriented architecture

A roadmap for migrating towards a service-oriented architecture is therefore of considerable strategic importance to a supra-national government and to individual governments in terms of planning future possible directions for eGovernment services.

The roadmap consists of two phases: the envisioning phase (which is shown in Figure 10) and the implementation phase (shown in Figure 11).

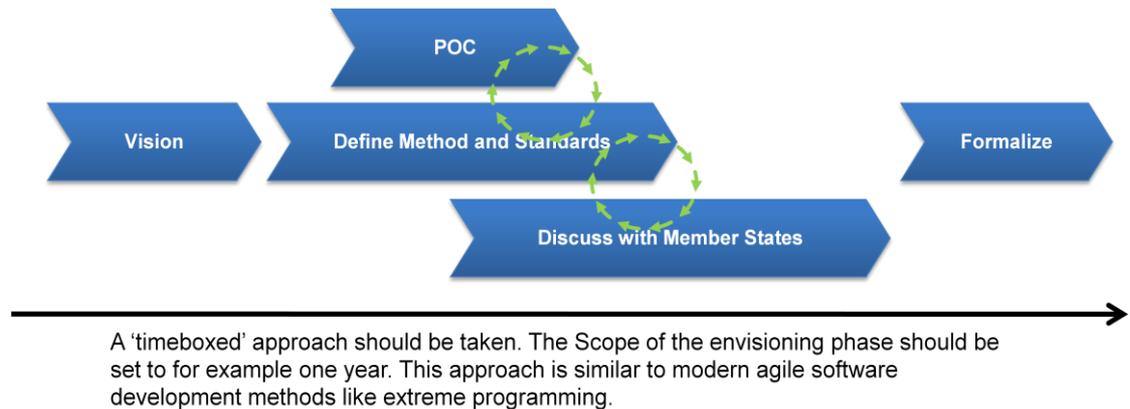


Figure 10 Roadmap: the envisioning phase

The **envisioning phase** is the phase in which the vision, the principles, the standards, the methods for the transition are set and tested. This vision relates to the scope, responsibilities, and levels of detail with regard to eGovernment services. The timeline for this phase is set at one year. Such a schedule would enable fast decision-making that has a strong focus on results. The intention is to design an iterative approach to a transition in which better results will be achieved in every repeat cycle.

In terms of the proposed vision, a number of alternatives for providing services according to the life event approach are possible based on the interviews undertaken by the study team:

- **Describing and implementing a finite set of life events.** An analysis should be undertaken for all possible life events that can occur. A service could then be designed and built for each one of these.
- **Viewing government as a platform.** Both public and private services could be created and bundled together to create new services.
- **Dynamic public service mediation.** An agreement could be reached on the semantic model needed by all the Member States. On top of that model, service mediation would be undertaken based on the formal description of activities.

When the vision and a tested and agreed set of principles, methods and standards have been formalised, an **implementation phase** should begin. The implementation phase would consist of four major steps:

- Installing a platform for both data sharing and service development.
- Developing and providing of services and open data during one year.
- Marketing these services and data to draw attention to this new platform.
- Evaluating and adjusting the vision, methods and standards.

The implementation phase is shown in Figure 11.

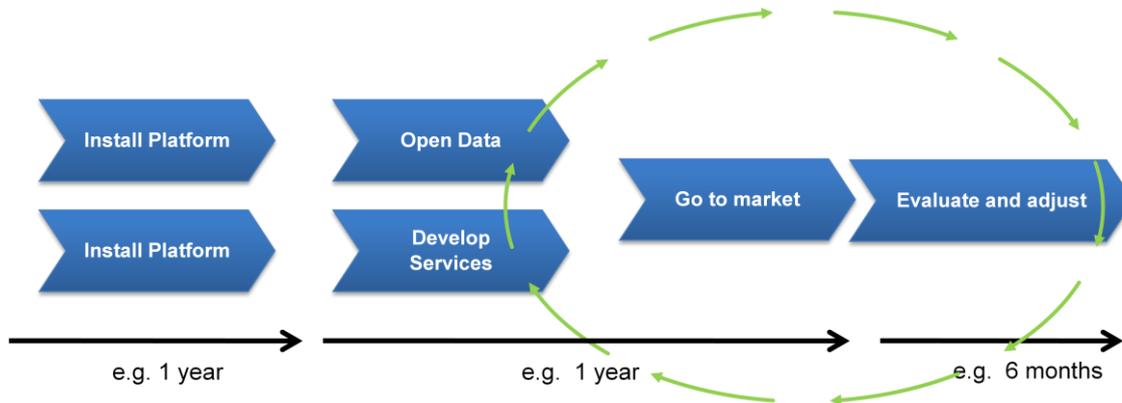


Figure 11 Roadmap: the implementation phase

3.3.7 Resources needed to achieve the target architecture

The precise resources needed to achieve this target architecture are difficult to estimate. They will definitely be based on the vision that is chosen. As a working example, the study team has proposed the following three alternatives for the envisioning phase³¹:

- Describing and implementing a finite set of life events.
- Government as a platform.
- Dynamic public service mediation.

For each of these three alternatives, an indication of the evolution of the costs has been provided over time. This evolution is indicated in Figure 12 and Figure 13. These two figures illustrate the evolution of both the development effort and the hosting effort required³². Figure 12 shows how development costs evolve over time for the three options.

When implementing a finite set of life events, development costs are stable over time as each life event requires a similar development effort. This first option also includes the assumption that investment costs would be reduced over time.

The second alternative, government as a platform, requires a higher investment upfront due to the installation of the platform. However, the development costs are reduced over time as private initiatives will gradually take over the development.

The third alternative, dynamic public services mediation, requires a very high investment budget upfront. This investment is needed in order for all Member States to agree on a semantic model. Over time, the assumption can be made that the development cost would be lower due to the re-usability of the semantic services.

³¹ This list is not exhaustive as other alternatives can also be developed.

³² It should be noted that these figures do not represent any underlying relationships between the cost evolutions of the alternatives.

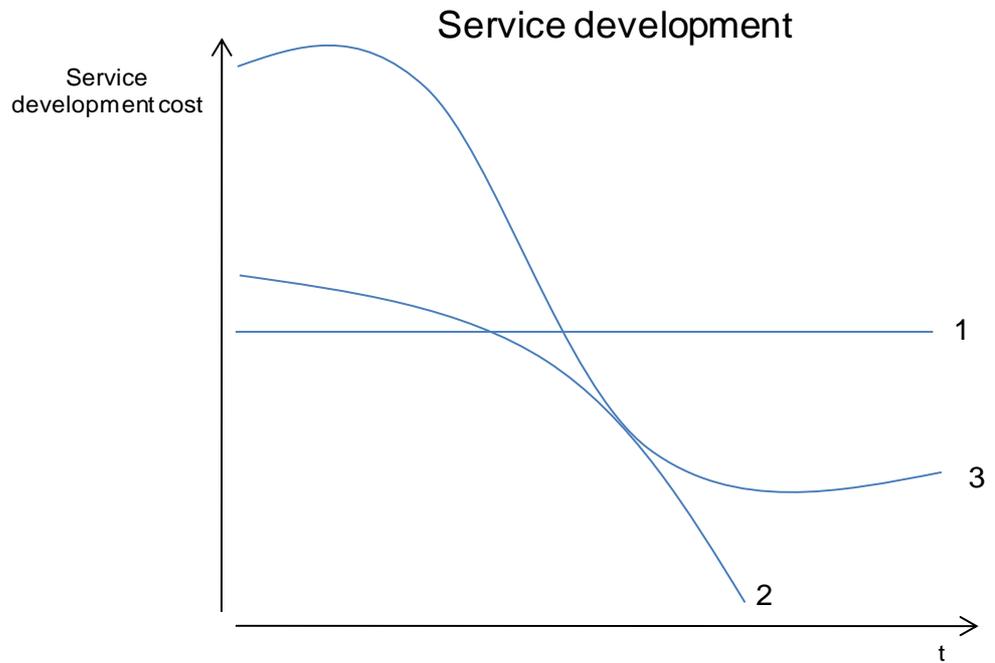


Figure 12 Evolution of service development costs

Figure 13 shows the evolution of the hosting costs for the three alternatives. For a finite set of life events, the hosting costs remain stable over time. The second and third alternatives indicate a more dynamic movement of hosting costs over time. This is due to the dynamics of the adoption rate and the evolution of the privately-developed services in the second alternative, and the re-usability of semantic services in the third.

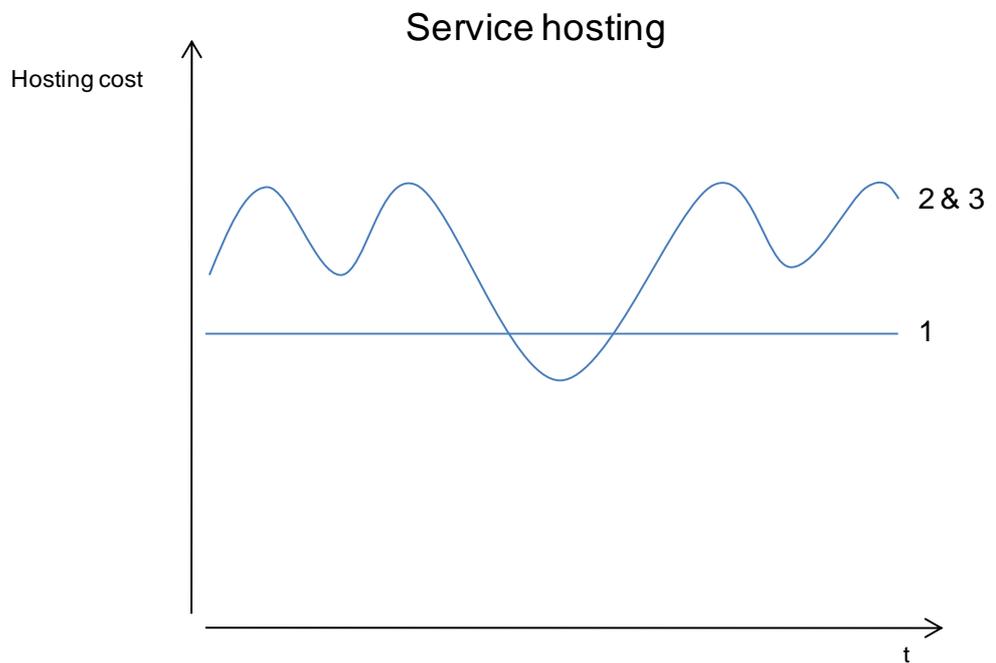


Figure 13 Evolution of hosting costs

4 Conclusions

Today's developments in online service provision, particularly in the private sector, reflect a rapidly changing environment in which services are increasingly user-oriented and draw on new opportunities and collaborative approaches.

Web 2.0 tools offer tremendous possibilities in the provision of user-centric services that can be personalised and integrated, and can be used very near-to-hand by users. They are likely to lead to the continued improvement of new, easy-to-use, online services.

eGovernment services have been lagging behind in these developments, although the study's desk research indicates some innovative new models. The use of Web 2.0 in eGovernment service provision is still generally at an early stage of maturation.

Through a series of concrete, empirical studies, this study highlights what approaches can be taken to shift towards a more innovative and transformational form of eGovernment at the service of Europe's citizens and businesses.

Reflections on a life events model

Life events can offer an appropriate and effective way of structuring different services. As a result, the underlying architecture needs to be oriented towards a more modular context. On the one hand, the structuring of information in terms of life events and, on the other hand, more modular architecture need to be brought together. Portals need to be adapted in a more coherent way towards a life events approach.

The ways of doing this involve the use of different technologies and channels for **service delivery**, the re-use of public sector information and services, and enabling different options for the provision of **core services**. As a result, public agencies, third parties, intermediaries, and end-users – indeed, citizens themselves – may become engaged collaboratively in producing, combining, embedding, re-packaging and delivering a variety of core services.

User needs and behaviour

Web 2.0 is not an aim in itself but is a set of tools that can be used to address the needs and behaviours of users of online services.

This study has indicated that it is important to investigate what are the needs and behaviour of users. The user experiments (conducted in a single Member State, with 130 persons, on scenarios based around a diversity of Member States) show that people are much more independent and pro-active than previously in their searches to solve personal ("life events") problems. The information provided on government portals is often difficult to find.

Much can be learned from the private sector in terms of how to re-design and re-orient public service delivery to fit much more effectively with the needs of citizens. This is not only because the provision of services may make sound sense for governments in terms of their responsibilities but also because it would mirror the growing expectations of Europe's people. Indeed, people are becoming much more accustomed to the use of Web 2.0 applications and social networking applications.

The toolset created by the use of Web 2.0 and Web 3.0 techniques is particularly aimed at enabling exactly this type of approach, i.e. to facilitate a move in a direction away from monolithic eGovernment towards what this study has described as an **atomic eGovernment model**.

Future scenarios for the re-use of eGovernment services

Four scenarios for separate life events were developed which integrate different Web 2.0 tools. These four scenarios were translated into visual mock-ups that introduce potential users to this new approach to service provision based on life events. These four scenarios are:

- ☑ 1. Stolen valuables abroad
- ☑ 2. Studying abroad
- ☑ 3. Working abroad

What users really want

A user survey was run that focused on the four scenarios. It approached 3,000 persons in three Member States during summer 2010. It investigated the response of users to these new types of services. Up to two-thirds of the users in the sample clearly welcome the 'stolen valuables' and 'working abroad' scenarios. A majority is also in favour of the 'studying abroad' and 'pandemic flu' applications, albeit the responses to these two scenarios were more moderate.

More than half of the people in the sample target groups are sure that **public agencies should collaborate with private actors to enable better information and service delivery** and that they **should make use of social media platforms more actively**. There is a clear belief that public agencies will have to **open up and exchange their data with other public and private actors**. There is also, however, a corresponding concern with regard to privacy risks; these are likely to require legal clarity in respect of data protection and privacy.

New Web 2.0 based models of public service delivery that are developed by government agencies in co-production with third parties show the potential to **better meet user needs** and, accordingly, to be **adopted by a significantly high proportion of today's online citizens**.

Key benefits and concerns

The core benefits of adopting new Gov 2.0 based applications perceived by these survey respondents were:

- **time savings,**
- **flexibility,**
- **convenience,**
- **simplified service delivery,**
- **handling all formalities using one single application,**
- **user service friendliness,**
- **convenient and better information provision,** and
- **personalisation and pro-activity.**

But there were also:

- **perceived privacy risks.**

What needs to be in place?

Key stakeholders who were interviewed identified a number of **key enablers** that would be needed to facilitate the future vision of service provision. These enablers include elements such as **opening up public data, providing accessible and re-usable public services within a service-oriented architecture and enabling an appropriate legal framework and standards to match the challenges of cross-border settings** (including with reference to data protection and privacy)

Government is seen as playing an essential role in facilitating the creation of these prerequisites. The most important hindrances to their adoption need to be resolved: **back-office integration and interoperability within the public sector not only within single countries but also across borders**. Interoperability is an essential enabler of such future eGovernment services.

The development of a sound **business model** is also important. Clear **economic incentives** are needed. Facilitating a **low threshold to the actual access and use of public services to create new value-added services** is critical.

Government is expected to aim at developing **basic, re-usable, services that are both attractive for the private sector to build on and end-users to take up**.

Service-oriented architecture: a key enabler

Service-oriented architecture is particularly well suited to help government agencies deal with the **obstacles** that currently inhibit their service provision. A wide range of **benefits** can emerge for both governments and citizens as a result of its introduction. Among these: the implementation of new systems that will enable governments to modernise their business architecture, integrate agency service delivery, share information across organisational

boundaries, and reduce costs by consolidating redundant application functionality. For citizens, it is about an improvement in services that will become much more oriented towards their needs.

Service-oriented architecture improves functionality. The services that will be provided as a result will be much more flexible, responsive, and geared towards individuals' requirements.

Various European opportunities exist

Four options exist that European authorities might contemplate: the provision of a service registry at European level; a reference framework for service provision by local authorities; the creation of open standards at European level; and improved collaboration between the public and private sectors.

A roadmap for migrating to a **service-oriented architecture** will help to achieve these options. The roadmap includes two phases: an envisioning phase and an implementation phase. Three alternatives are suggested for the envisioning phase: **describing and implementing a finite set of life events**, **government as a platform**, and **dynamic public service mediation**. The implementation phase would consist of: the **installation of the platform**, **developing and providing services**, **marketing these services**, and **evaluating and adjusting** the vision, methods and standards.

These shifts are already underway

From the proposed new means of service delivery and the expectations of users, a move towards a greater focus on **service provision via a service-oriented architecture** is inevitable. Not only do Europe's citizens expect such services to be developed but the services will also enable public agencies as well as third parties to create important added-value for society as whole.

To enable this type of service delivery, a **clear policy commitment and vision** are required to put the key enablers in place. Government, therefore, plays a fundamental part in creating of the prerequisites for this transformation and tackling the major obstacles to its introduction.

Several next steps are needed at policy level

A number of possibilities can be contemplated to establish future scenarios for public service delivery. They involve a high-level road mapping exercise and strategy development.

Such an exercise could be supported by the identification of various actors and their roles, and engagement of these stakeholders; a cost-benefit analysis of the work to be undertaken; an impact assessment; a matching exercise with activities already underway; ongoing surveys; and a wider exploration of users' expectations of the life events model in its application to eGovernment services.

These recommendations are spelled out in greater detail in the section which follows.

5 Recommendations

A set of recommendations are outlined here that indicate potential direction that could be taken by both governments and other players (whether private sector or civil society) to establish future scenarios for public service delivery. The ideas which follow are example directions and activities that emerge logically from the findings of this study.

The recommendations are aimed at achieving various means by which the EC in conjunction with the Member States' authorities together with other stakeholders (particularly industrial players, but also including civic society) might move towards implementing a new way of providing eGovernment services in a life event context.

The extent to which they are put into practice is a matter for decision-making between the EC and the Member States. These recommendations are very much geared towards a European setting.

We outline here, first, a set of recommendations which are policy-oriented, but which also include a number of practical decisions which underpin them. We then, second, list a more technically-oriented practical possibilities.

5.1 Policy orientations

Several identifiable next steps are needed, starting at a policy-oriented level, within the EU. In this context, eight different suggestions – of different orders of magnitude – might be borne in mind. They involve a high-level road mapping exercise and strategy development. They can be supported by: the identification of various actors and their roles, and a definition of these stakeholders; a cost-benefit analysis of the work to be undertaken; an impact assessment; a matching exercise with activities already underway; ongoing surveys; and a wider exploration of users' expectations of the life events model in its application to eGovernment services:

- **High-level roadmap and strategy development:** A high-level policy roadmap is needed (which enables the formulation of guidelines for and by both policy-makers and systems' developers). Such a mapping exercise would facilitate indications of the appropriate legislative and regulatory premises and framework required. It would also attempt to identify the costs and benefits of any move in this direction: these two concerns would appear to be of considerable interest to the Member States, according to this study's final validation workshop. The appropriate involvement of stakeholders also needs to be a component of such a mapping exercise. A form of white boarding exercise which can facilitate the free thinking of both policy-makers, industrialists – both large and small – and civic society is needed.

Here, we do not privilege the precise directions that the high-level mapping might take. However, a number of possibilities can be based on notions of strategic management and organisational change (Australian Government, 2010; CS Transform (2009; 2010)). Possible options for discussion and debate include: making a public declaration on future directions; coordinating leadership and governance; offering guidance for public agencies; offering awards for good practice; opening up public sector information; addressing copyright issues; enhancing information publication; enhancing accessibility of sites and information; ensuring secure use of Web 2.0 tools; ensuring privacy and confidentiality; clarifying ownership or use of publications and data; and – last but not least – “info-philanthropy” (recognition and gifting of voluntary and not-for-profit services).

5.1.1 Practical efforts needed to support the policy orientations

A number of support mechanisms and actions would be needed to support the high-level road mapping and strategy development. Eight recommendations, along these lines, are suggested here.

- **Expansion of understanding of the practical further application of a number of concepts** such as: openness and transparency; engagement with citizens; the release

of non-sensitive public sector information; and collaboration on these activities with third parties.

- **Various actors and their roles:** Identify even more precisely than has been done in this study what the EC can do; what governments can do; and what third parties can do to facilitate a service-oriented architecture that is based around life events. An industrial platform of stakeholders might constitute one format for such an initiative: more detail on this concept is outlined in section 5.3.
- **Stakeholder engagement:** Facilitating the process of getting the stakeholders engaged in the architecture and design process: helping to involve the different stakeholders who can take action; encourage their participation in developing the “architecture roadmap”; try to see what kinds of visions the different stakeholders can have of the “architecture roadmap”.
- **Cost-benefit analysis:** Undertake a cost-benefit analysis of the organisation of eGovernment according to a service-oriented architecture that is based around life events e.g., using eGovernment as a platform and/or according to a set of selected life events. This action would appear to be of considerable interest to the Member States, according to this study’s final validation workshop.
- **Impact assessment:** Establish the need for an impact assessment of a service-oriented architecture: e.g., identification of what are the general benefits in social, economic, and ecological/environmental terms; similarly, an analysis of what are the facilitators, the barriers, and the methods.
- **A matching exercise with any activities already supported by the EC:** Identify to what extent the proposal for a service-oriented architecture is similar to activities that the EC is supporting already e.g. within the Competitiveness and Innovation Programme Information and Communication Technologies Policy Support Programme and its various large-scale (or other sized) pilots; the Interoperability Solutions for European Public Administrations programme; and any relevant innovation platforms. It is also feasible that the matching exercise could be more undertaken more widely, in terms of other international efforts.
- **Europe-wide surveys:** Establish the need for a wider base of user surveys (e.g., in line with the 2007-2008 user satisfaction life events), and identify how the different Member States perceive the possibilities for the use of a service-oriented architecture; continue a “future watching” exercise based on benchmarking or bench learning surveys.
- **A wider form of exploration of users' expectations in terms of a life events approach and service-oriented architecture:** While the underpinning policy and theoretical approaches needs to be understood, and any activity should certainly respect the relevant European and national legislations in these matters, such an assessment might be effectively handled in an empirical or applied manner. For example, it could occur in parallel with the trialling and application of the concepts i.e., in a large-scale pilot or demonstrator project that could be accompanied by a thematic network/stakeholder support mechanism. Particular scenarios could continue to focus on the cross-border context and the exchange of data: examples might include contexts related to security, emergency events, or safety that might be more intensively associated with healthy ageing or public health concerns.

Having explored the possibilities for both some high-level and generic recommendations, two sets of more practical applications are then laid out.

5.2 Technically-oriented actions to support the policy orientations

Other recommendations for activities (presumably among and within Member States) need to be undertaken at national and regional levels of organisation. These would focus on the organisation of collaborative Web 2.0 eGovernment initiatives and the implementation of service-oriented architecture for government (and other) services. Many of the resulting suggestions are oriented towards flexible and exploratory activities and instruments. They include six suggestions for:

- **Large-scale (or smaller-scale) pilots:** these may either be a completely new pilot or they could be associated with successfully-conducted completed or ongoing pilots.
- **The creation (or extension) of possible building blocks** (such as various service repositories or platforms).
- **The creation or extension of various architectural guidelines** (for example, they could be based on the European Interoperability Framework).

- The recording, extension, and learning from **good (or best) practices**.
- **Exploration of a variety of tools and techniques:** While ensuring a sound approach to Web 1.0 might be a starting-point, other Web 2.0 and 3.0 methods might be considered. Examples include: i) Explore the opening up of governmental data – always in respect with European and national legal requirements – and develop analytical capacities to share and manipulate the data in collaboration with third parties (citizens, NGOs, businesses). ii) Explore the use of new Web 2.0 techniques in eGovernment service delivery models. These could include: social networks; crowd-sourcing, rich content; blogging; and social bookmarking iii) Large-scale participation and collaboration in terms of creating, editing, ranking and distributing content should be considered. iv) Finally, in an enhanced form of exploration, government (or government with third party) use of the semantic web, sophisticated search mechanisms, and personalised browser technologies might be considered for piloting.
- **The establishment of various stakeholder groups** (e.g. with industry – both large-scale and also small- and medium-sized enterprises) or with civic society groupings.

5.3 Other practical and applied orientations

Among the more practical and applied level outcomes of this study, both the envisioning and the implementation phase of the service-oriented architecture approach need to be facilitated.

An **industrial platform** might provide a useful forum through which to explore these notions. Some preliminary observations with regard to such an organisational platform are made here:

- **Approach:** Take a specific sub-domain of the exercise of developing an eGovernment-related service-oriented architecture, and take action on it within a single year; develop a kernel community of industry players; involve a key set of experts and individuals in the exercise who possess the requisite skills; examine the outcomes and results of this pilot exercise; fine-tune the mechanism with the involvement of various hardware and software architects; involve both large-scale industry leaders and the representatives of small- and medium-sized enterprises; and determine the form of reporting mechanism that needs to be used.
- **Financing mechanism:** Offer relatively small sums of financing (e.g., €20-50,000) to individuals or companies which are able to offer concrete proposals to support the process and help to develop a list of services. This seed corn approach could be based around grants or donations from public sector bodies, private sector enterprises, and various other forms of investment mechanism (whether banks or "business angels").
- **Non-sensitive open data:** Particularly with publicly-available non-sensitive public sector or governmental data, this platform might seek to explore a range of possible approaches from 'OpenGov' to Web 2.0. These could include how social networks; crowd-sourcing, rich content; blogging; and social bookmarking might be applied in ways that would add value for businesses, citizens and governments. Similarly, user feedback on the quality of public or governmental websites and their functionality, usefulness, and accessibility. Also, an enhanced exploration of third party use of the semantic web, sophisticated search mechanisms, and personalised browser technologies in relation to such non-sensitive open data might be considered for piloting.

6 Discussion

A final set of reflections on the study and its conclusions are outlined in this section of the final report. These focus on two elements: the benefits that life events can bring to citizens, governments, and third parties; and the possibilities that they may offer in terms of service provision.

In an information-driven age, the ability of governments to seize the opportunities of new technologies may ultimately spell the difference between success and failure for the public sector. Government will never truly realize the transformative benefits of information technology until government systems, ways of delivering services, and bureaucratic structures are rethought and redesigned to reflect the realities of the Information Age.

Social networks, in particular, can promote the life events/service-oriented architecture model and make it usable. A social network can be available to find solutions to how “you” (the user) can locate certain solutions to your problem situation. In general, if they are not on the Web – and even when they are – people are very accustomed to ask their friends and relatives how to find a solution to a problem.

Web 2.0 can help governments to provide better solutions to people’s problem situations. However, the interface of these “solution solvers” probably needs to be improved. Both the direct and indirect outcomes and the process need to be enhanced.

Overall, an enhanced form of life events brought together with service-oriented architecture can be built up because it can be shown that the study findings:

- ✔ Provide a solid body of evidence.
- ✔ Indicate – through both the user experiments and the surveys – that a more flexible, convenient, and practical way to develop the steps involved in a life events/service-oriented architecture can be developed and used.
- ✔ Indicate that there is a variety of different approaches and solutions that can be applied.
- ✔ Offer several ways of leading to better policy outcomes.

6.1 Life events approach and its benefits

The life events approach may bring benefits for citizens, governments, and third parties.

Life events models have been used ever since the start of the first decade of the twenty-first century to organise government delivery of services on Web portals.

In parallel, there has been a growing sense of individualisation that has taken place within society generally. This study has shown that people are intent on problem-solving in a more independent and pragmatic manner than governments have traditionally provided through their own services. Regardless of this dramatic and insistent change in users’ approaches, most governments have not yet modified their approach to the life events concept.

The life events approach continues to provide certain **interesting opportunities to governments in terms of their service provision**. As an approach, it should not be forgotten or overlooked: rather, it has to be surrounded by **higher levels of innovation and collaboration**, and adapted to more contemporary **modes of behaviour and expectations**. Governments can build on the opportunities offered by people’s experience of individual life events. They can also take advantage of third party provision of services, either because it makes business sense or because it complies with a new vision of societal and economic development.

On the one hand, **Web 2.0 can help governments to provide better solutions to people’s problem situations**. Individual problem-solving may be transformed into a more locally-oriented achievements through the creation of a community of intermediaries. However, the interface provided to these “solution-solvers” needs to be improved. This implies that both the direct and

indirect outcomes, and the process related to problem-solving need to be enhanced. **Web 2.0 provides a toolkit that enables governments – in conjunction with third parties – to enhance their e-services so that they become really user-centric.**

Social networking, in particular, can promote and make more usable a life events approach which would be based on a service-oriented architecture. Since individuals are highly likely to ask e.g. their friends and relatives how to work out a solution (when they are not on the Web): perhaps such an online family and friends-based community could be created that would help with the resolution of life events. Such a use of social networks in these circumstances would help users to find solutions to their specific problem situations. However, other third parties might also act as trusted, and trustworthy, intermediaries in the provision of such services.

However, social networking and its role in service provision that correspond with life events is just the tip of the iceberg. Web 2.0 provides **many more useful tools** such as crowd sourcing, creating and sharing data and services, and an increased personalisation of both tools and services. These tools can be used by both government – but also third parties of a wide variety of types – to improve services. Both government and third parties should be enabled to produce services, to target people's needs better, and to make the development of services more user-oriented and be provided where they are at the time that they need them (their "proximity").

Hence, governments do not necessarily need to devote greater resources to the design and re-design of the presentation of their data. **The message here for governments is to orient the provision of their services towards the actual support models that Europe's citizens are becoming more and more familiar with using.**

Ultimately, therefore, eGovernment services may benefit from several Web 2.0 features. These include greater responsiveness through automatic or on-demand delivery of services; the personalisation of services; an increase in social participation through such techniques as consultation, petitioning, support networks and community provision sites; and a growth in collaboration through the use of collaborative production techniques (such as crowd-sourcing, expert tools, mass collaboration and joint production of services). **While these approaches can enable governments to respond more effectively to the individual needs of Europe's citizens and businesses, they can also help to involve public, private or civic society partners more positively in constructing society.**

6.2 Life events and the organisation of services

As governments seek to re-organise themselves in terms of efficiency and effectiveness, the possibility arises to take advantage of currently available, and developing technologies, and new partnerships. An option is revealed: to shift from the "traditional" life events approach to the organisation of public services towards a more atomic form of organisation.

This shift would provide an opening that would enable governments to focus more solidly on those activities which constitute their legal and mandatory obligations.

It also implies, however, that governments must also break down ("atomise") the services they offer into components that can be embedded in other third party platforms and thus create a **real life events' experience.**

Such a shift would also reflect a greater responsiveness on the part of governments. The approach would mean a move from "*life event*" to "**live event**" (i.e., that when a citizen searches for a solution, the actual event that she or he is experiencing is real, it is "live", immediate, solution-oriented, and is happening to "me", the citizen or user "now").

A life event is a process that consists of many different tasks, and in which many transactions can take place with many parties (both public and private).

Life events in general indicate a transition process which may have several implications for governments. Such a phase of transition can enable Europe's citizens to experience various opportunities for problem-solving, for learning, for grasping opportunities, and for participating more in their community – ultimately, for becoming more empowered and involved. It may also offer the opportunity to collaborate more pro-actively with third parties which are capable of providing a wider variety of services and which may perceive a solid business case for doing so.

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Life events study - associated reports

Phase 1 Life Events Report - Study on user expectations of a life events approach for designing e-Government services, Deloitte, July 25 2010

Phase 2 Platforms Report - Study on user expectations of a life events approach for designing e-Government services, Deloitte, September 22 2010

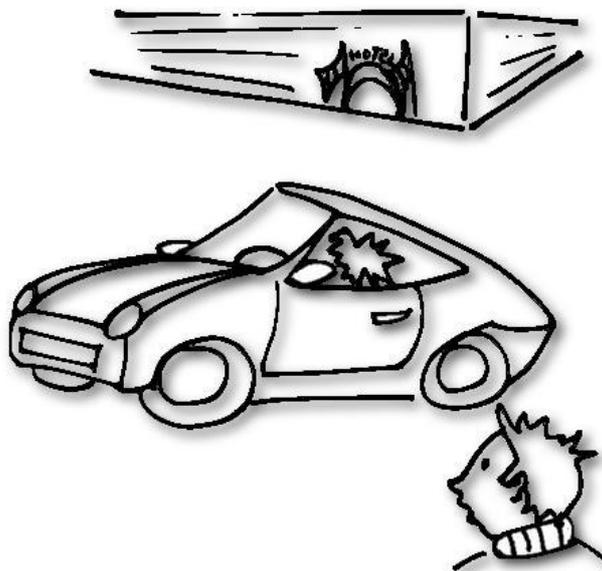
Phase 3 Architecture Report - Study on user expectations of a life events approach for designing e-Government services, Deloitte, September 15 2010

8 Annexes

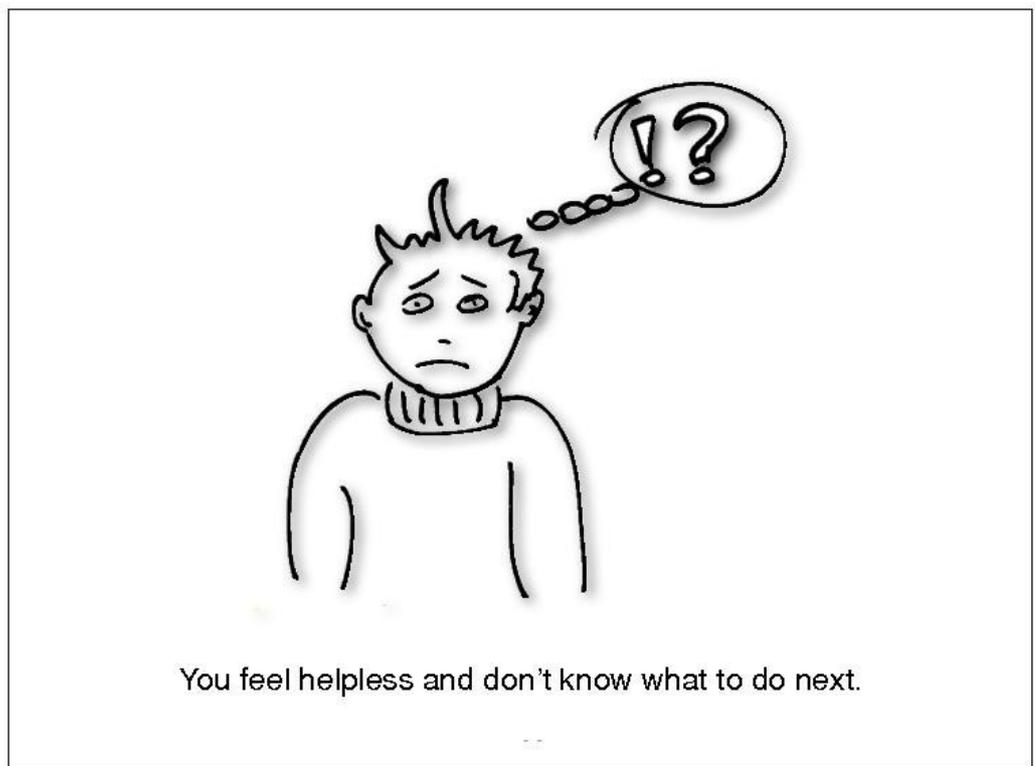
8.1 Annex 1 - Life event visual mock-ups

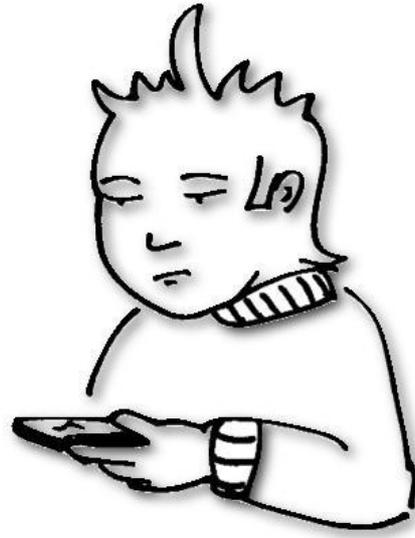
8.1.1 Scenario 1: 'Stolen valuables abroad'

A future scenario for registration of stolen valuables abroad.



You are traveling in another member state and your rental car is broken into the day before you are due to fly back home.





Luckily, you still have your mobile phone with you.



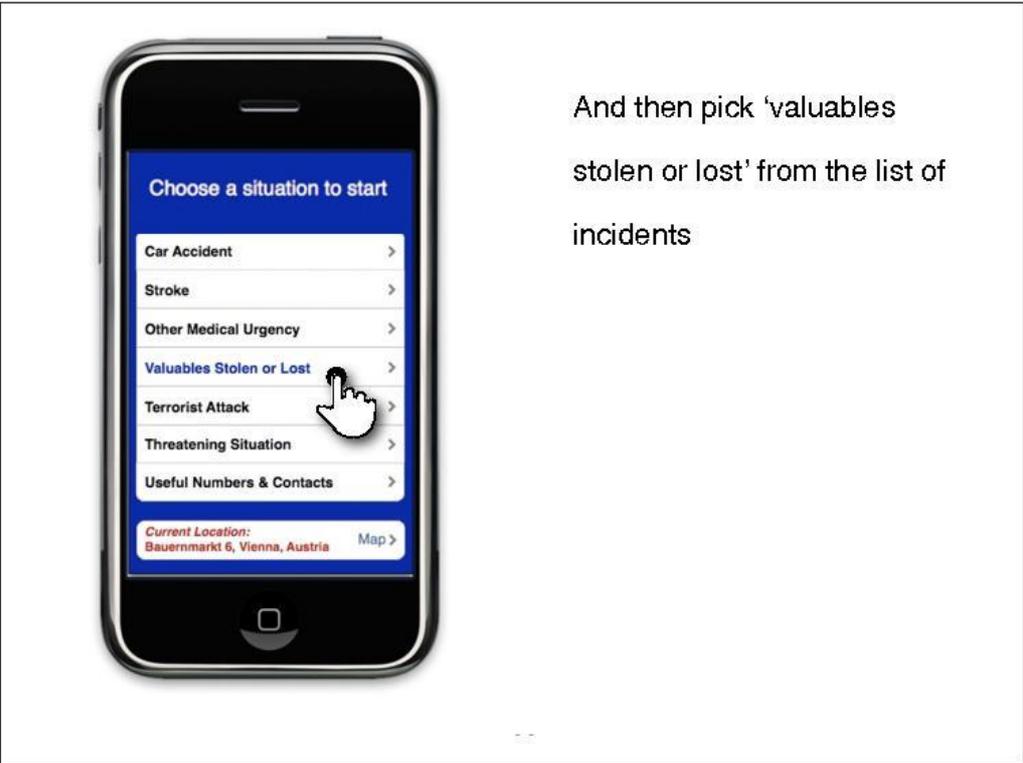
You start the **Global Help Application for European Citizens** on your mobile phone....



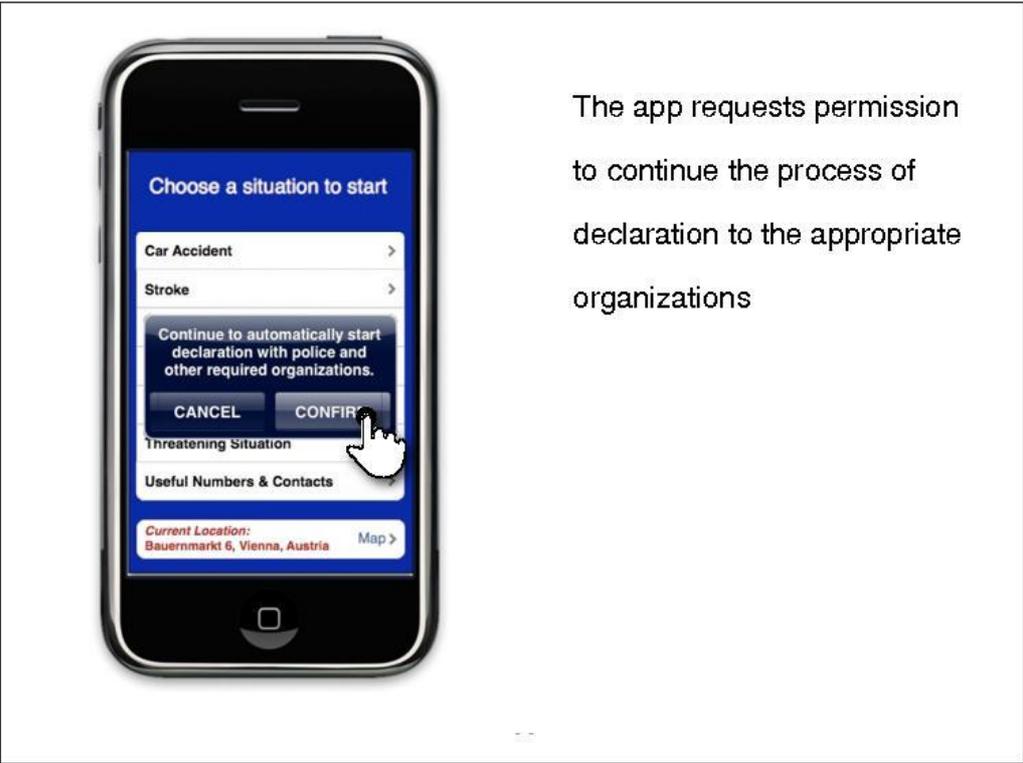
...and see a list of different crisis situations.



You first check your position on a city map...

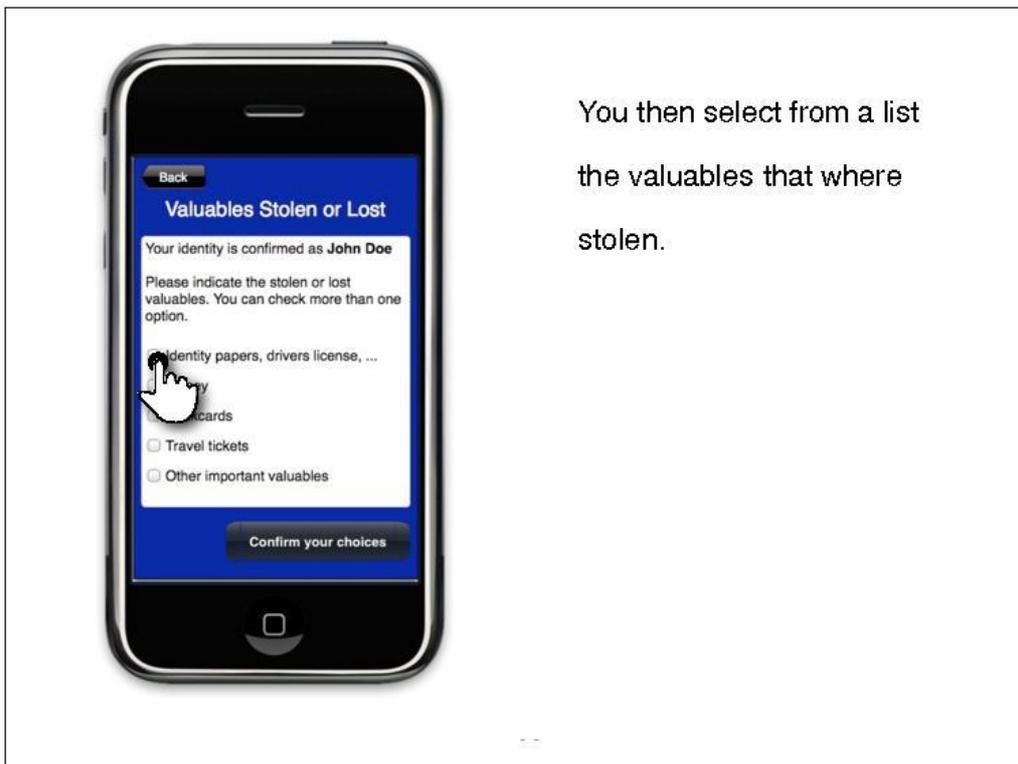


And then pick 'valuables stolen or lost' from the list of incidents

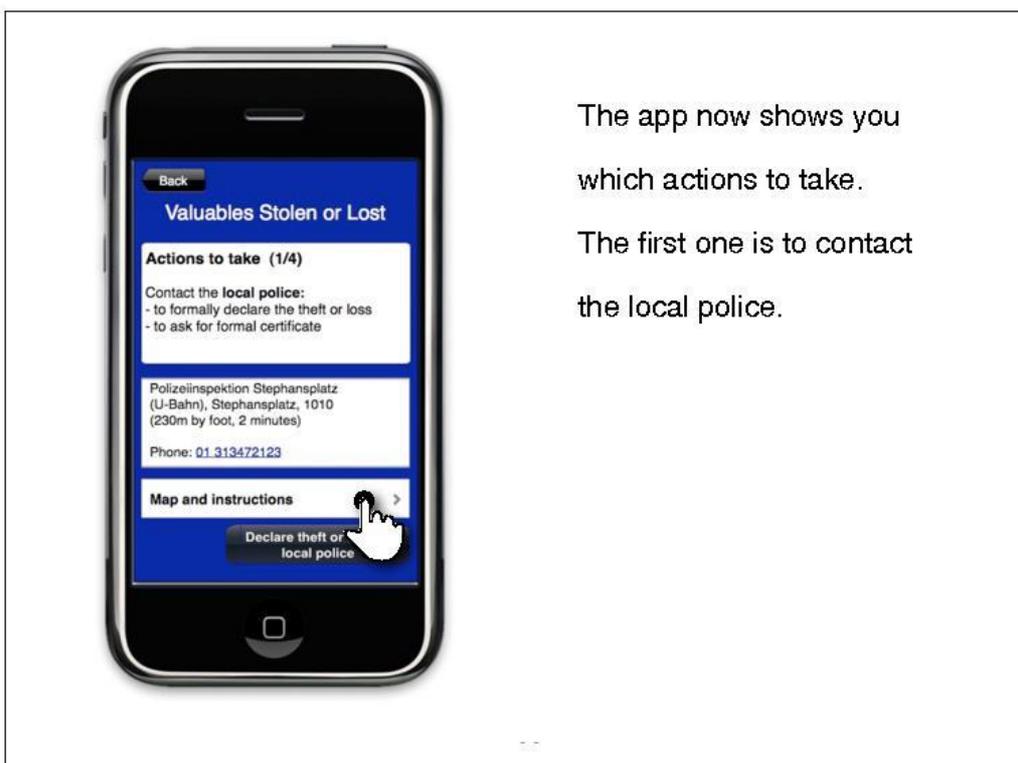


The app requests permission to continue the process of declaration to the appropriate organizations

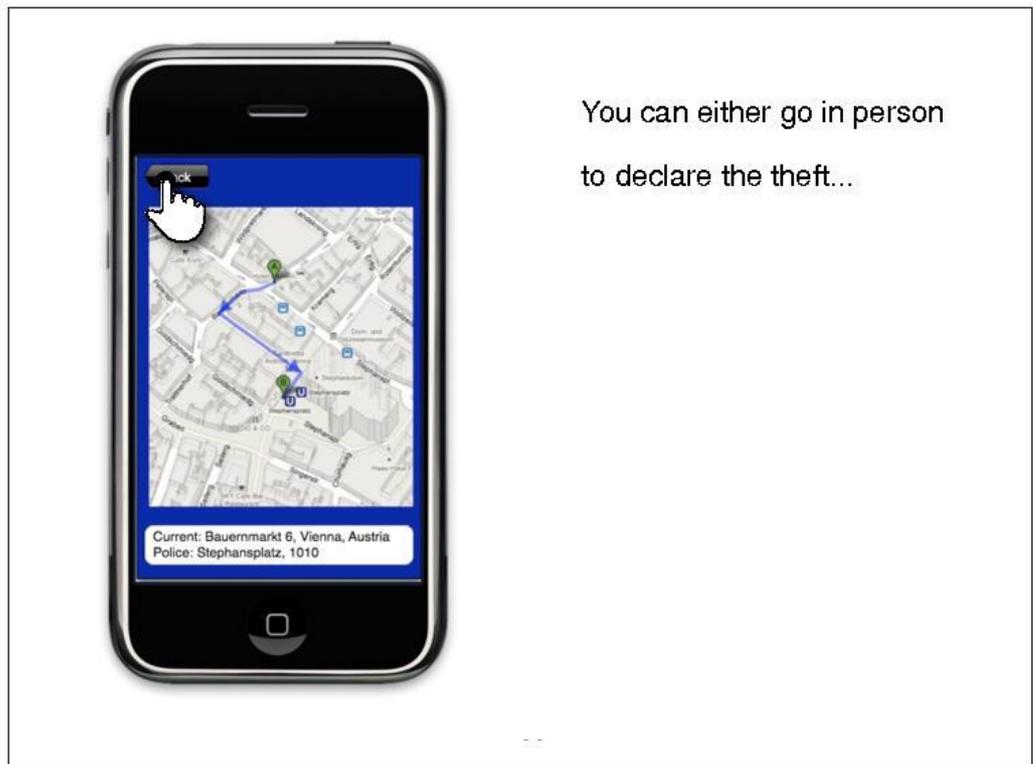




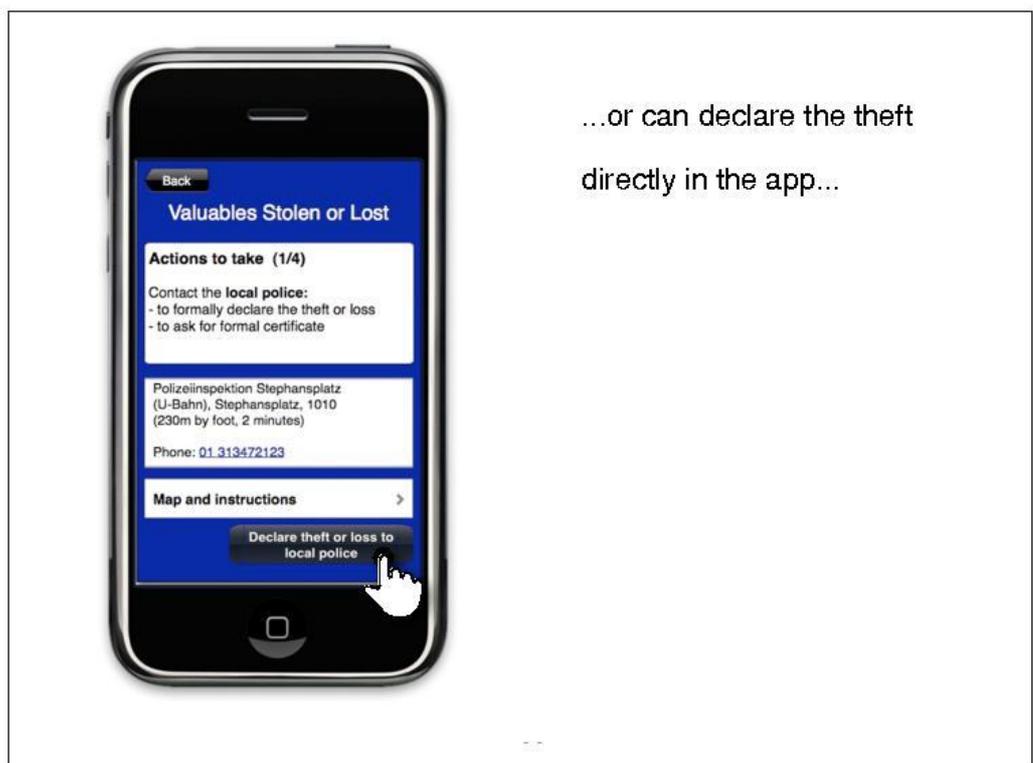
You then select from a list the valuables that were stolen.



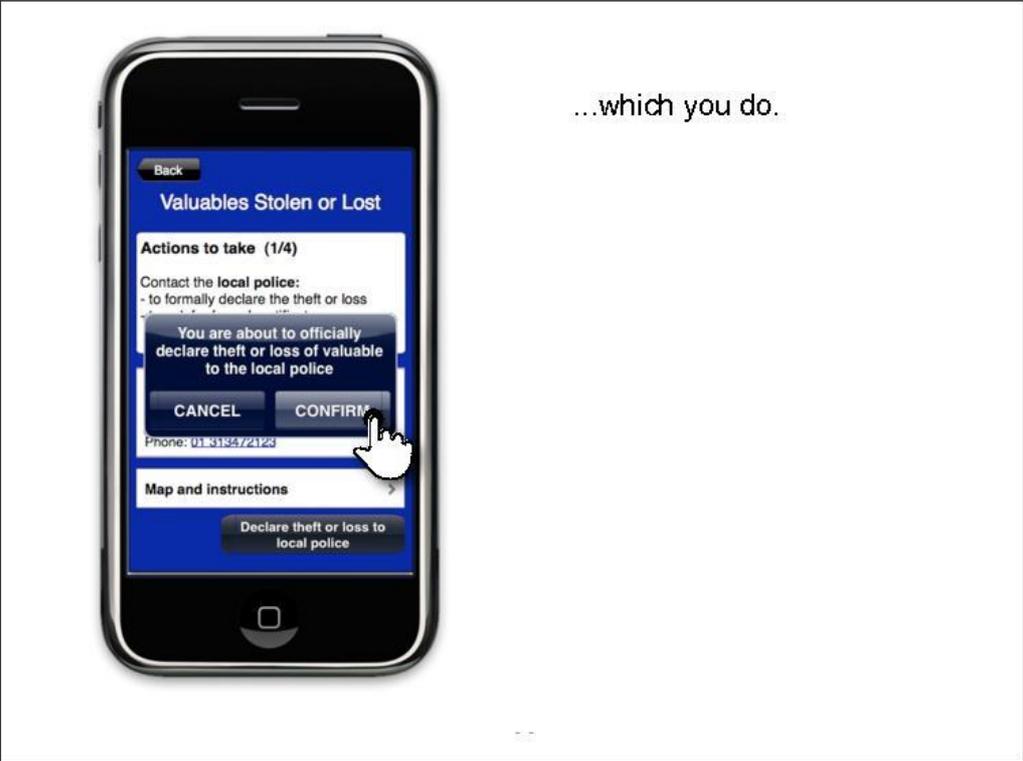
The app now shows you which actions to take. The first one is to contact the local police.



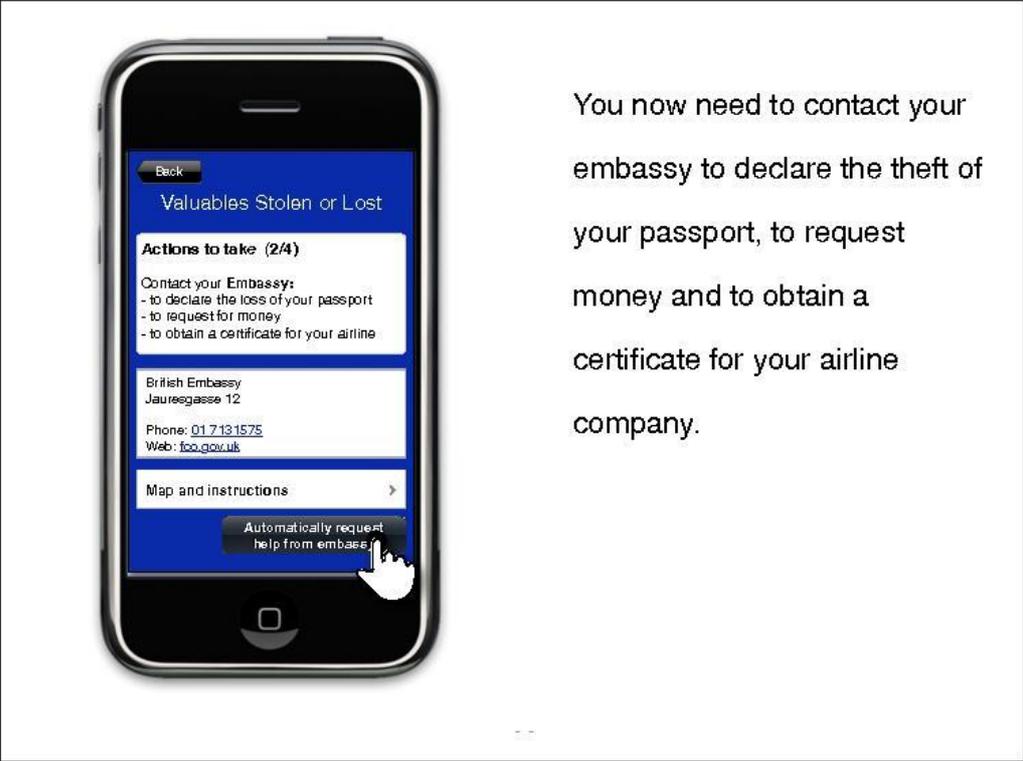
You can either go in person
to declare the theft...



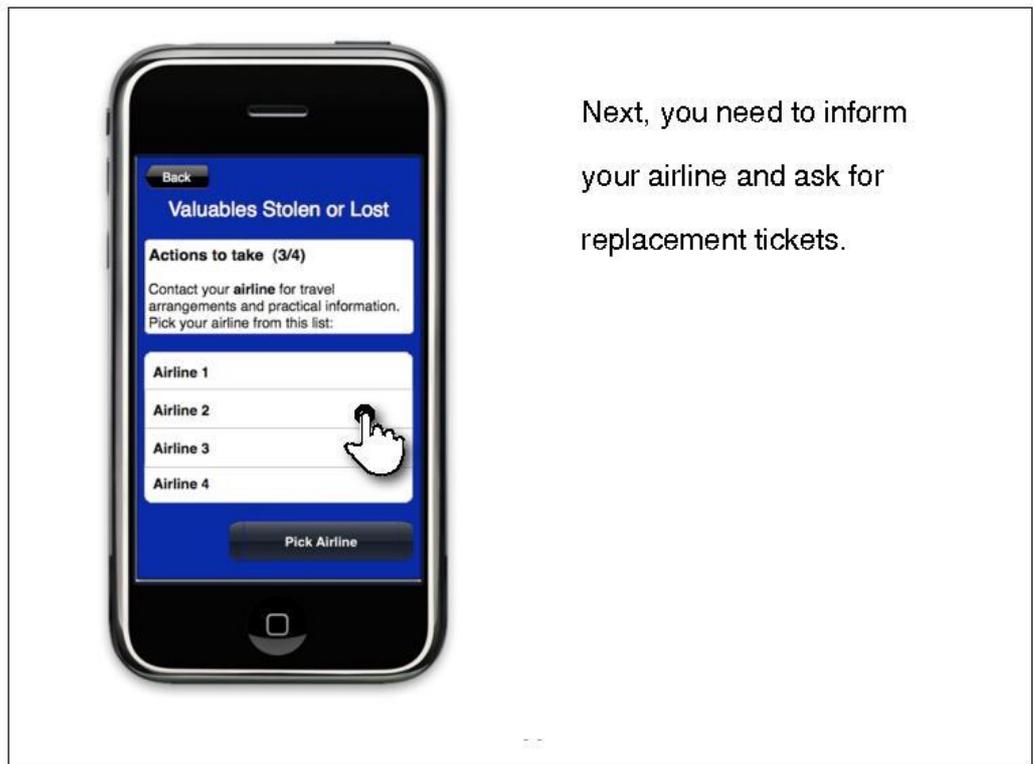
...or can declare the theft
directly in the app...



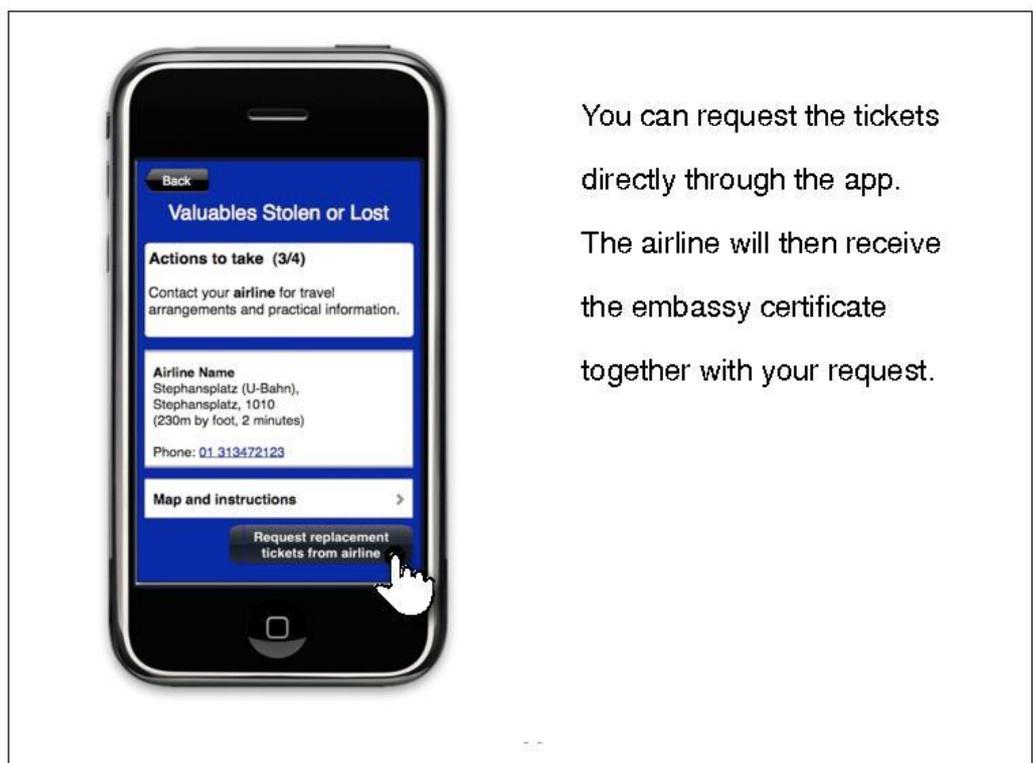
...which you do.



You now need to contact your embassy to declare the theft of your passport, to request money and to obtain a certificate for your airline company.



Next, you need to inform your airline and ask for replacement tickets.



You can request the tickets directly through the app. The airline will then receive the embassy certificate together with your request.

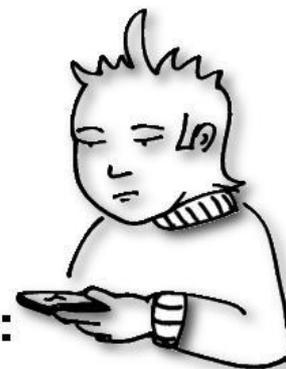


Finally the app gives a status overview of the actions already taken and the things to do next.



In your hotel's Business Center, you can follow-up your status on a Global Help website and print out some documents.

To sum up... with the Global Help App:



you are guided through the actions to take during a crisis

you can handle all formalities using one simple app

you can follow up your personal files

8.1.2 Scenario 2: 'Studying abroad'

A future scenario for preparing to study abroad.



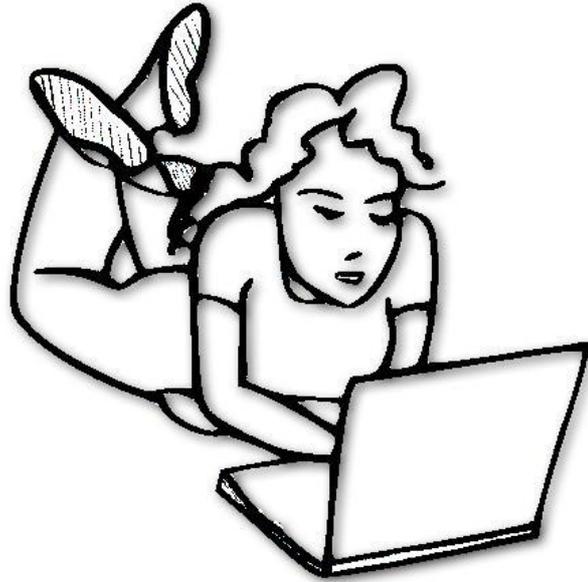
You want to do a study or exchange programme in another country...



...and need to find a university and a whole bunch of other things



Visa ? Grant ? Housing ? Which are the best places to stay ?
You don't know where to start...



While checking your Facebook wall on your laptop...

22



....you get to know the Facebook Students Abroad App.



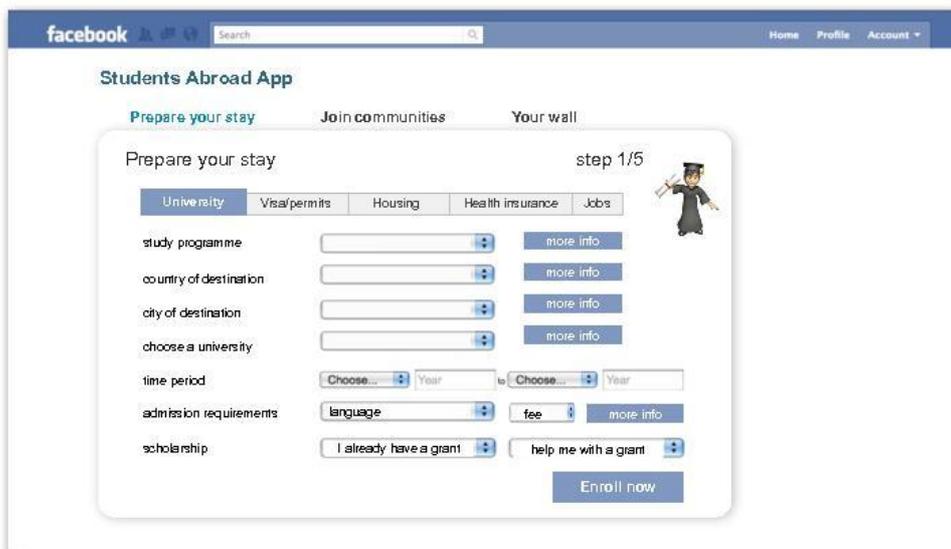
It'll connect you with other students and will help you to fulfill the necessary procedures.



You install the App.



The first step is to prepare your stay.



The App can help you make various choices like which study programme, which destination country and which institution.

The screenshot shows the Facebook interface for the 'Students Abroad App'. At the top, there is a navigation bar with 'facebook', a search bar, and links for 'Home', 'Profile', and 'Account'. Below this, the app title 'Students Abroad App' is displayed, followed by three tabs: 'Prepare your stay', 'Join communities', and 'Your wall'. The main content area is titled 'Prepare your stay' and indicates 'step 1/5'. A small cartoon character of a student is visible on the right. The 'University' tab is selected, showing a form with the following fields: 'study programme', 'country of destination', 'city of destination', 'choose a university', 'time period' (with 'Choose...' and 'Year' dropdowns), 'admission requirements' (with 'language' and 'fee' dropdowns), and 'scholarship' (with 'I already have a grant' and 'help me with a grant' dropdowns). Each field has a 'more info' button. At the bottom right, there is an 'Enroll now' button.

On the other hand it allows you to start the enrollment procedure directly in the App.

The screenshot shows the Facebook interface for the 'Students Abroad App' at 'step 2/5'. The 'Visa/permits' tab is selected. The main content area is titled 'Immigration regulations' and features a table with the following rows:

Category	more info	required ?	Apply
Visa	more info	required ?	Apply
Residence permit	more info	required ?	Apply
Work permit	more info	required ?	Apply

The cartoon character is also present on the right side of the form.

You can arrange your visa or permits...



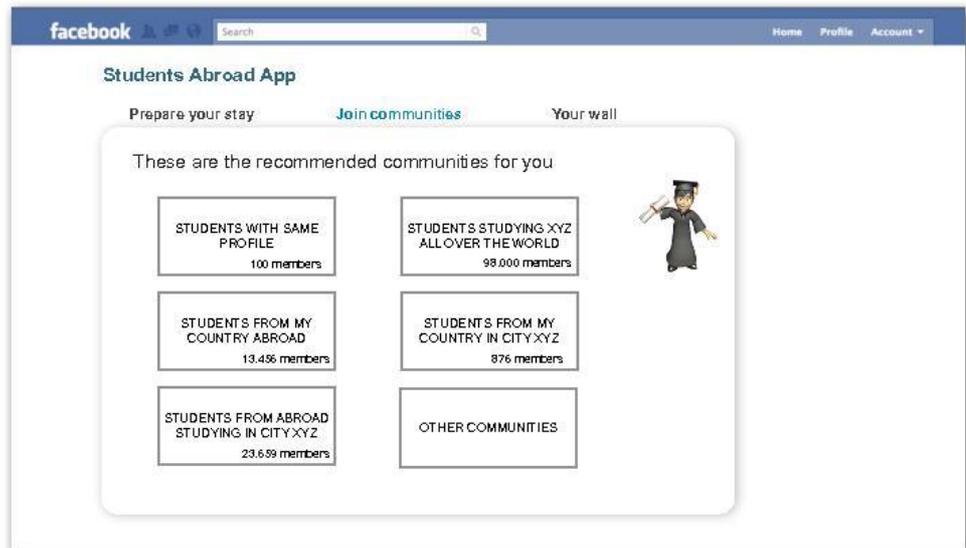
...look for a place to stay...



...make sure that your health insurance and medical records are properly registered in the new country of your choice...



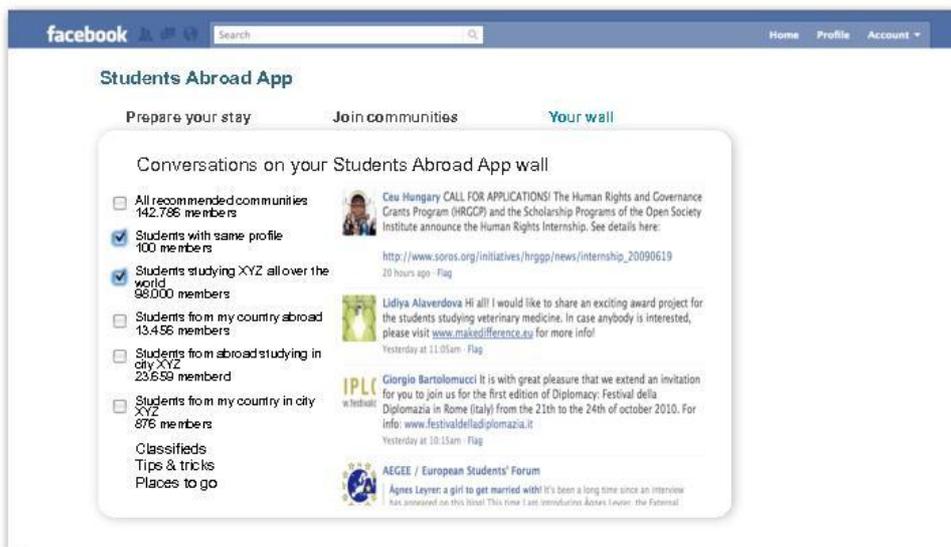
...and look for a job in the 'job database for students' if you wish to work during your period of study.



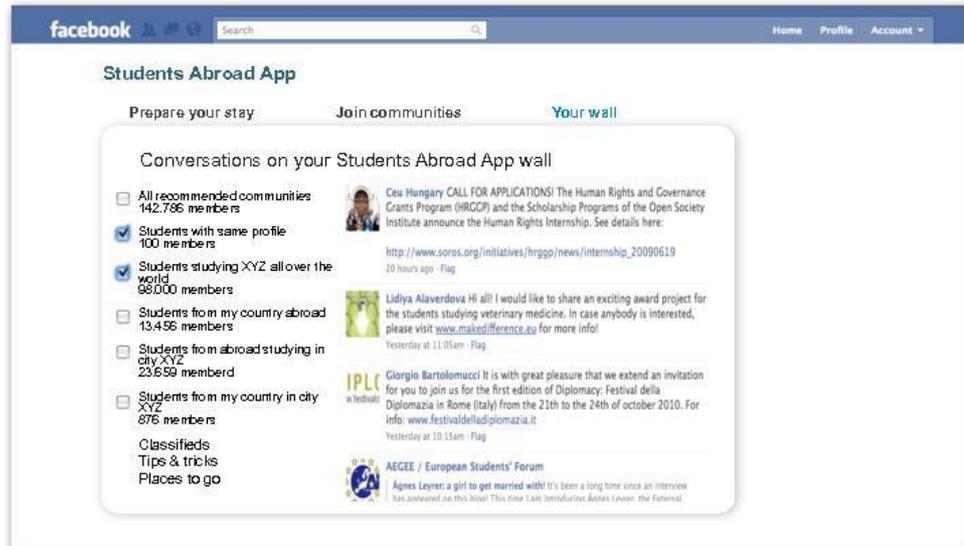
Once the App knows a bit more about your plans, you are recommended to join some relevant communities...



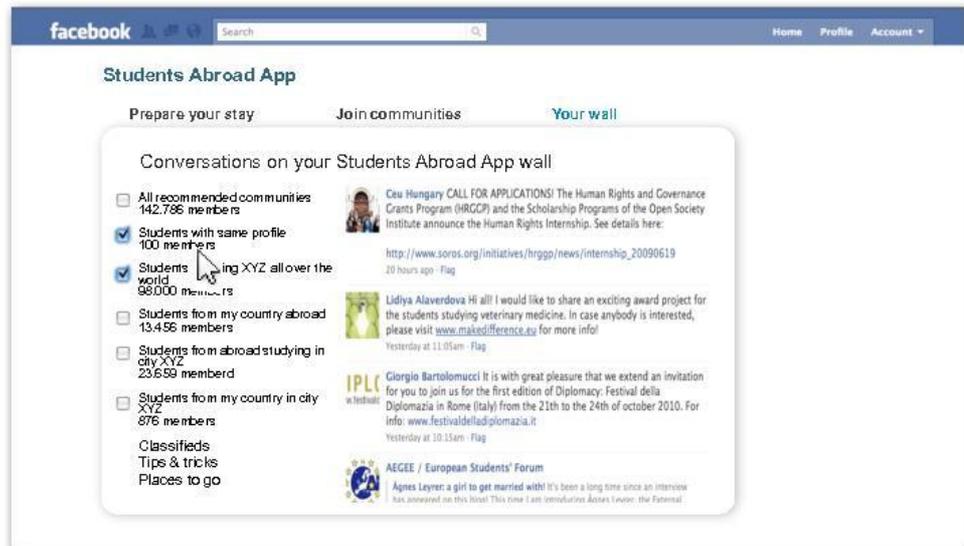
...such as 'students having the same profile', 'students studying the same programme all over the world', etc.



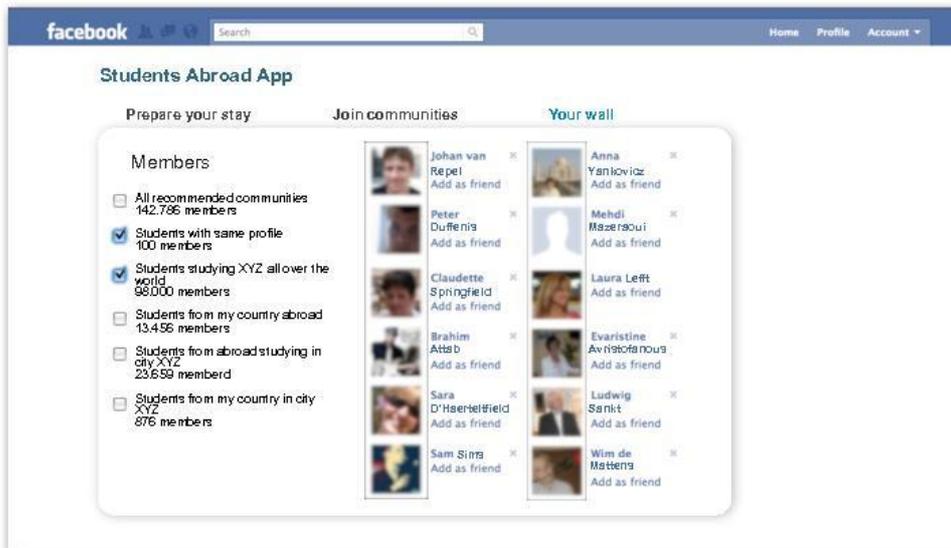
After joining the communities of your choice, you see the conversations on your App wall.



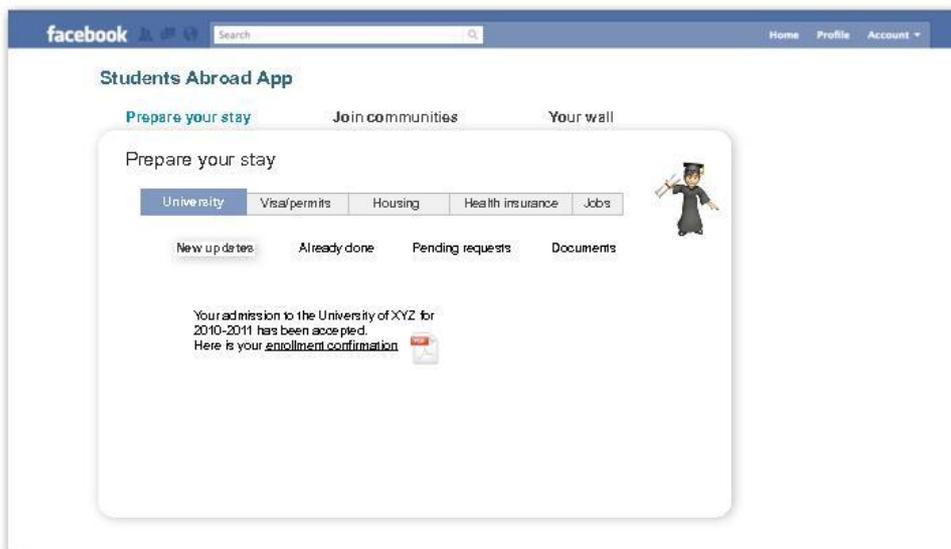
You can also go to the classifieds section, or consult tips and tricks and places to go.



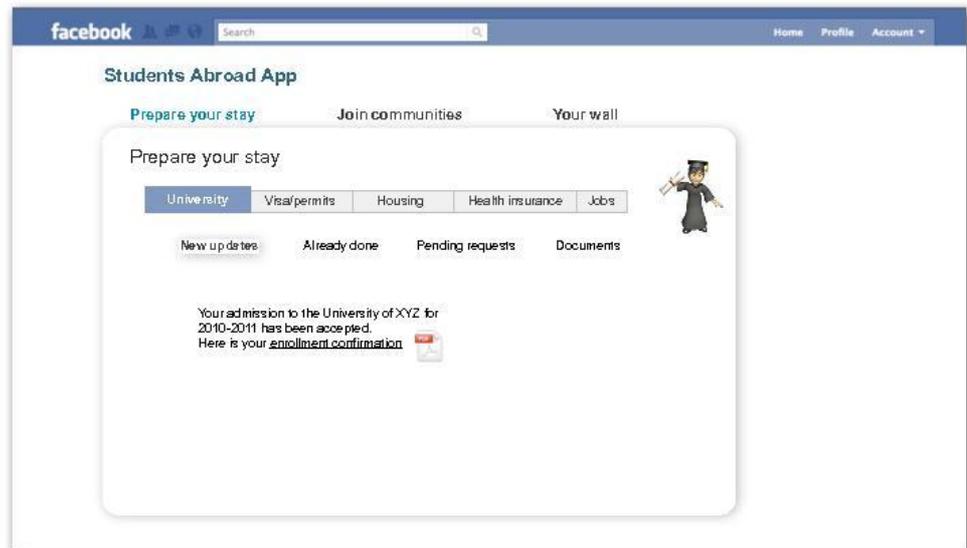
These groups will help you orientate yourself and will provide you with useful information.



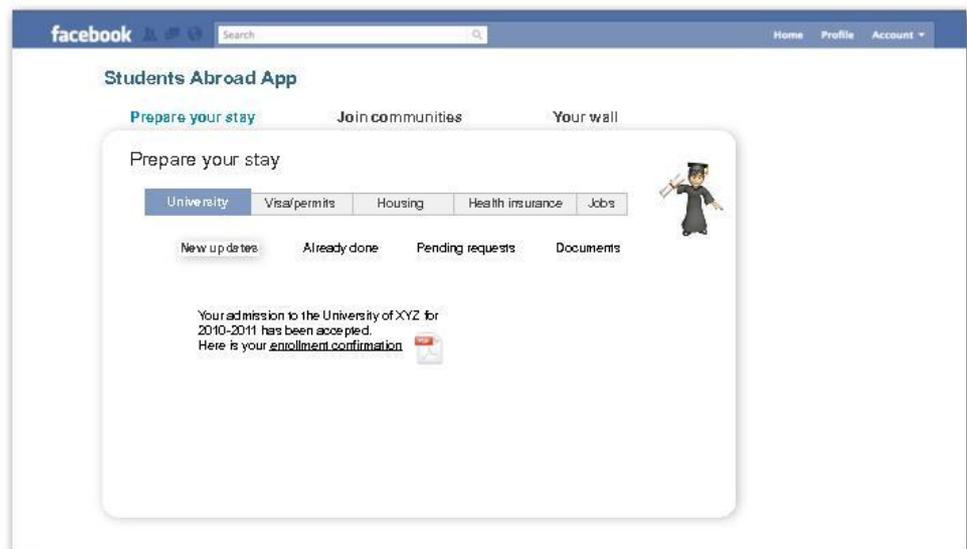
You are able to see the member list of a particular community and can send each of them a message or a friend request.



You can consult your personal file in the App at any time.



You will be kept informed of new updates that apply to you as they are posted.



You will also find the things you've already done, any pending requests and the documents you need to keep.



**To sum up...
with the Students Abroad App:**

you get to know other students abroad

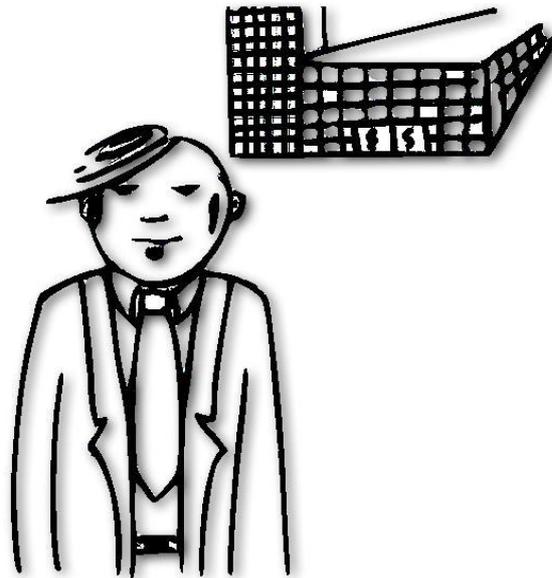
you are guided and informed by direct and personalized information

you can handle the official administration through one single App
and consult your file afterwards

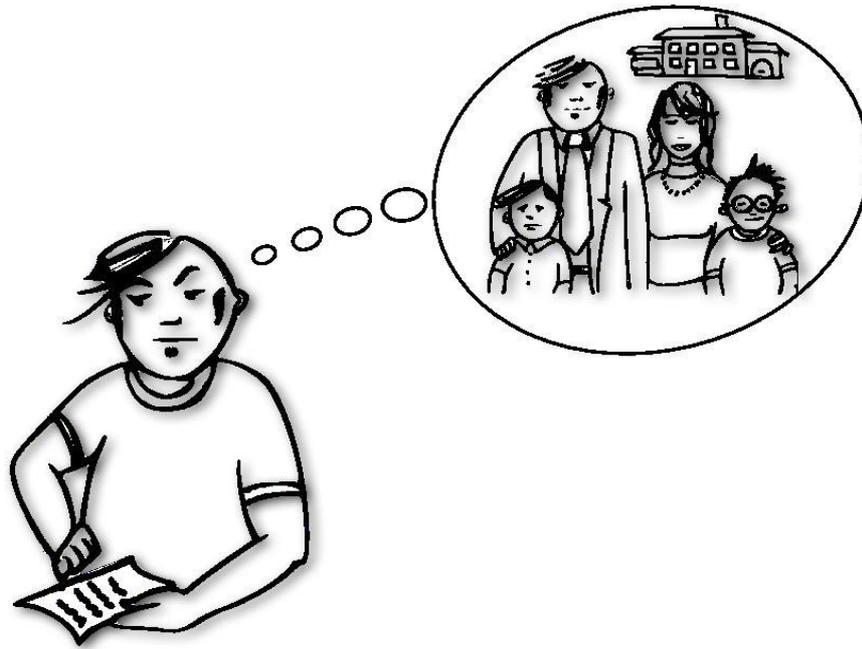
22

8.1.3 Scenario 3: 'Working abroad'

A future scenario for preparing to work and relocate in another member state



You have been sent by your employer to work for a year in another member state.



You need to sort out a lot of things, like finding housing, a new school for your children and completing any necessary paperwork



While checking LinkedIn on your laptop...

The screenshot shows the LinkedIn interface with the following elements:

- Header: "Basic Account: Upgrade", "Welcome, John Doe", "Add Connections", "Settings", "Help", "Sign Out".
- Navigation: "Home", "Profile", "Contacts", "Groups", "Jobs", "Inbox (24)", "More...".
- Search: "People" dropdown, "Advanced" search button.
- Activity Summary: "€100k+ Jobs in Europe - Join for free today".
- Network Activity: "Share an update" box with "Attach a link" and "Share" buttons.
- Activity Feed:
 - Serge Bajjry**: "Breast cancer deaths fall in UK". Post text: "Breast cancer deaths have fallen in the UK since the 1980s, but mortality rates from the disease continue to be among the highest in Europe, a study shows." (1 minute ago)
 - Wim Vandenoopstelle**: "Installed the Expat App and is now connected to other expats. Working abroad soon? Go to the Expat App." (21 minutes ago)
 - Tim Eborrows**: "is now connected to Yvonne Duykstra" (21 minutes ago)
 - Tim Eborrows**: "has an updated profile (Headline)" (29 minutes ago)
 - Jay O'Hara**: "has an updated profile (Experience)" (29 minutes ago)
- People You May Know: List of users with "Connect" buttons.
- Advertisement: "Working abroad soon? Connect with other expats and arrange your stay! Go to the Expat App." with an image of a person with a globe.

...you get to know the LinkedIn Expat App.

This screenshot is identical to the one above, but with a yellow highlight box around the post by Wim Vandenoopstelle and the advertisement on the right. The highlight box also encompasses the "Share" button of the post above it.

It allows you to get in touch with other expats and help you with the necessary procedures.

Basic Account: Upgrade Welcome, John Doe · Add Connections · Settings · Help · Sign Out

LinkedIn Home Profile Contacts Groups Jobs Inbox (24) More... People - Q Advanced

Applications FAQ Feedback Browse More Applications

Expat App

Application preview



The Expat App connects you with other expats, according to your profile. It's also a useful tool to prepare your departure and stay and to arrange several obligations like tax registration, a new school for your child, etc...

Application Info



This app is fully secure and in line with the European Data Privacy Directive
Category: Network and Utility

- display on my profile
- display on LinkedIn homepage

[Add Application](#)

So, you install the secure and personalized Expat App in your LinkedIn environment

Basic Account: Upgrade Welcome, John Doe · Add Connections · Settings · Help · Sign Out

LinkedIn Home Profile Contacts Groups Jobs Inbox (24) More... People - Q Advanced

Applications FAQ Feedback Browse More Applications

Expat App

Let's complete your profile 1/3

I am an expat right now
 I will be an expat soon
 I have been an expat recently

current country of residence

destination country

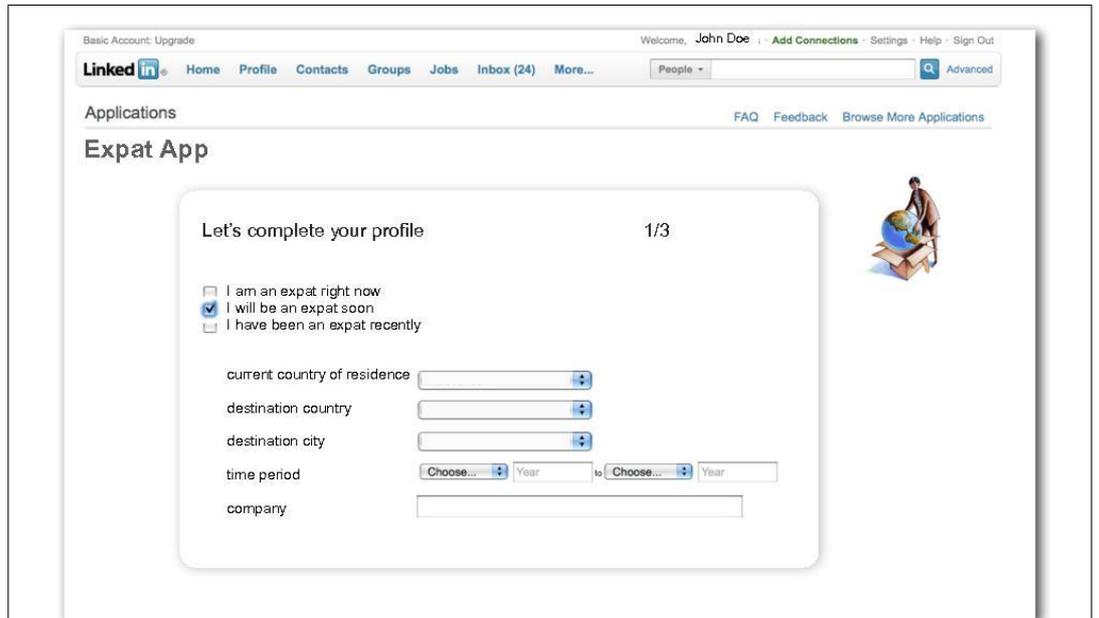
destination city

time period Choose... Year to Choose... Year

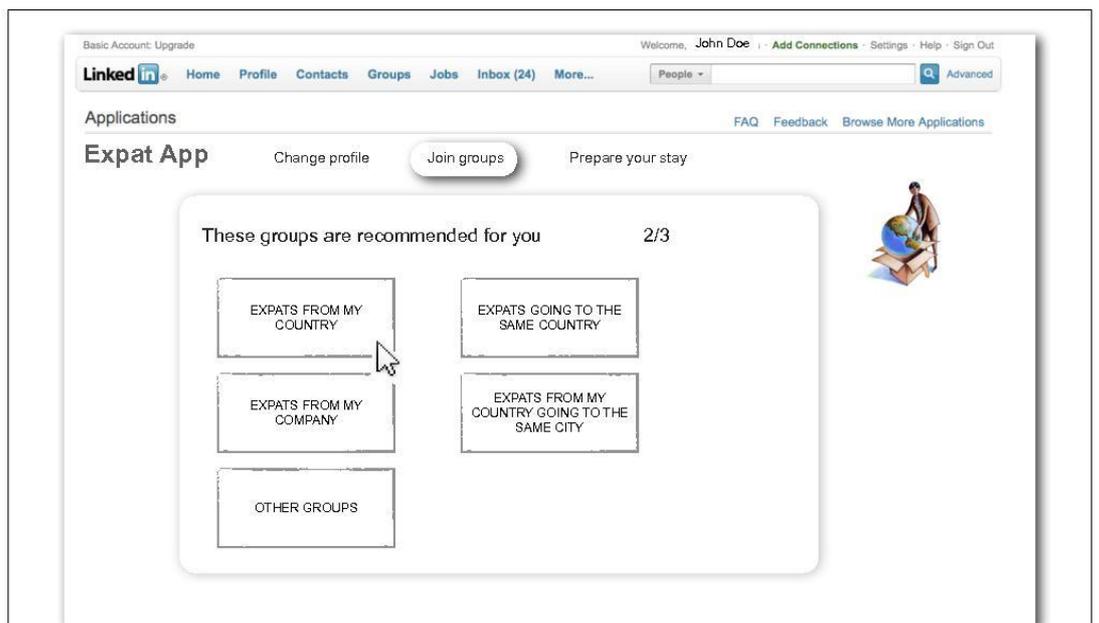
company



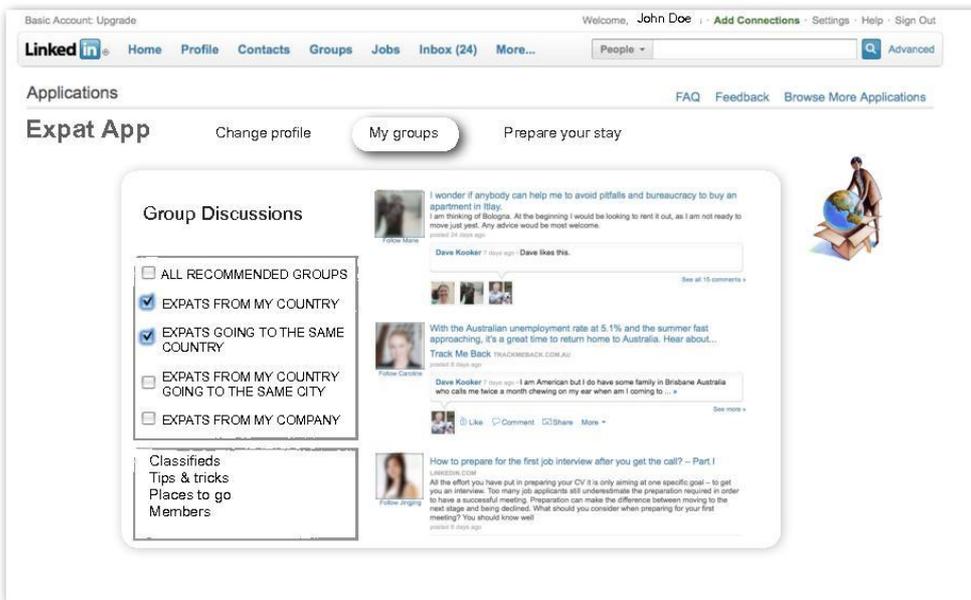
The first step is to complete your profile...



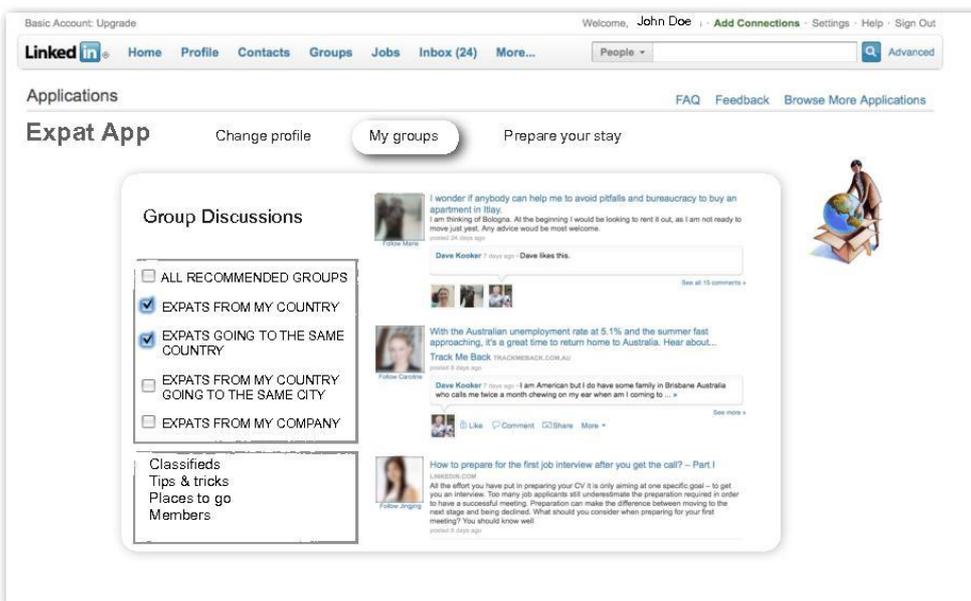
You indicate your expat status, your current country of residence, your destination country and city, the planned period of stay and the company you work for.



You are recommended to join some relevant groups such as 'Expats from your native country'.



After joining the groups of your choice, you see the Group discussions.



You can also go to the classifieds section, or can consult tips and tricks, the places to go and the group members.

Basic Account: Upgrade | Welcome, John Doe | Add Connections | Settings | Help | Sign Out

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Applications | Expat App | Change profile | My groups | Prepare your stay

Group Discussions

- ALL RECOMMENDED GROUPS
- EXPATS FROM MY COUNTRY
- EXPATS GOING TO THE SAME COUNTRY
- EXPATS FROM MY COUNTRY GOING TO THE SAME CITY
- EXPATS FROM MY COMPANY

Classifieds
Tips & tricks
Places to go
Members

Group Discussion 1: I wonder if anybody can help me to avoid pitfalls and bureaucracy to buy an apartment in Italy. I am thinking of Bologna. At the beginning I would be looking to rent it out, as I am not ready to move just yet. Any advice would be most welcome.

Group Discussion 2: With the Australian unemployment rate at 5.1% and the summer fast approaching, it's a great time to return home to Australia. Hear about... Track Me Back TRACKMEBACK.COM.AU

Group Discussion 3: How to prepare for the first job interview after you get the call? - Part I

These groups will help you orientate yourself and will provide you with useful information.

Basic Account: Upgrade | Welcome, John Doe | Add Connections | Settings | Help | Sign Out

LinkedIn | Home | Profile | Contacts | Groups | Jobs | Inbox (24) | More... | People | Advanced

Applications | Expat App | Change profile | My groups | Prepare your stay

Prepare your stay 3/3

Housing | Municipality | School | Health insurance | Tax registration

Your city of destination is XYZ.
Do you already have accommodation ?

yes

no

Real Estate Agencies in XYZ

XYZ Make!
Davidson & Co
XYZ 2000

The final step is to prepare your stay.
You can use the Real Estate Agencies-database to find a house...

Basic Account: Upgrade Welcome, John Doe · Add Connections · Settings · Help · Sign Out

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Applications FAQ Feedback Browse More Applications

Expat App Change profile My groups Prepare your stay

3/3

Housing **Municipality** School Health insurance Tax registration

Municipality Services:
Please Register yourself and the members of your family

First Name:

Last Name:

Former/Maiden Name:

Country:

Zip Code:

[Save Changes](#)



...you can register yourself with the municipality...

Basic Account: Upgrade Welcome, John Doe · Add Connections · Settings · Help · Sign Out

LinkedIn Home Profile Contacts Groups Jobs Inbox (24) More... People - Q Advanced

Applications FAQ Feedback Browse More Applications

Expat App Change profile My groups Prepare your stay

3/3

Housing Municipality **School** Health insurance Tax registration

Your city of destination is XYZ.
Do you already have a school for your children ?

yes

no

Schools in XYZ

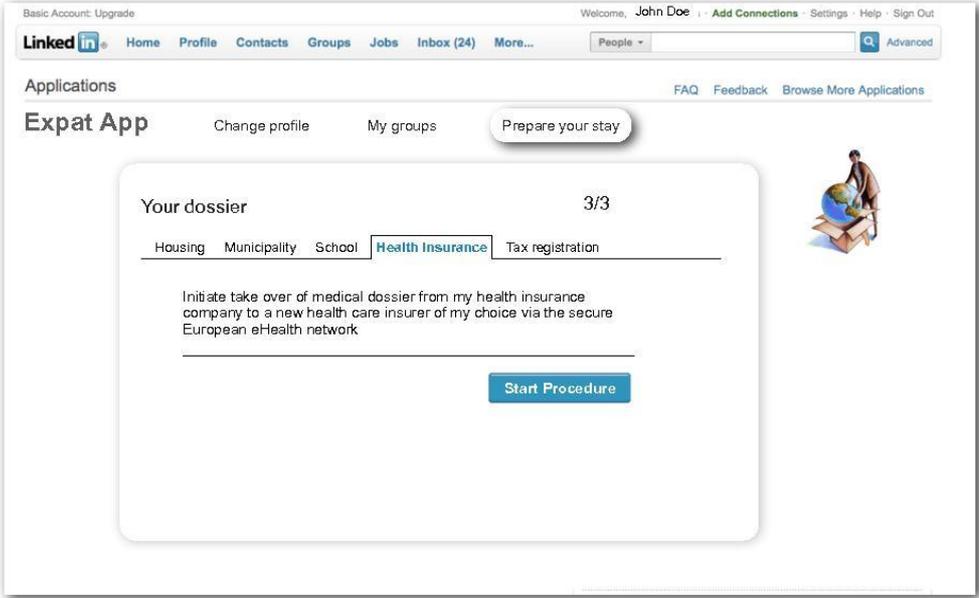
[XYZ School](#)

[Saint John's College](#)

[VIT](#)

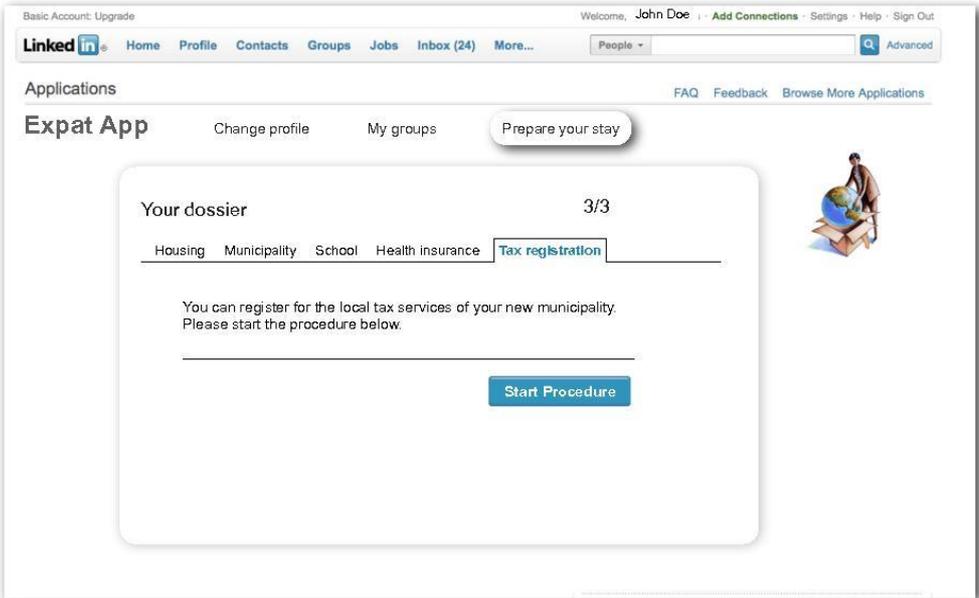


...choose a new school for your children and enroll them directly in the app...



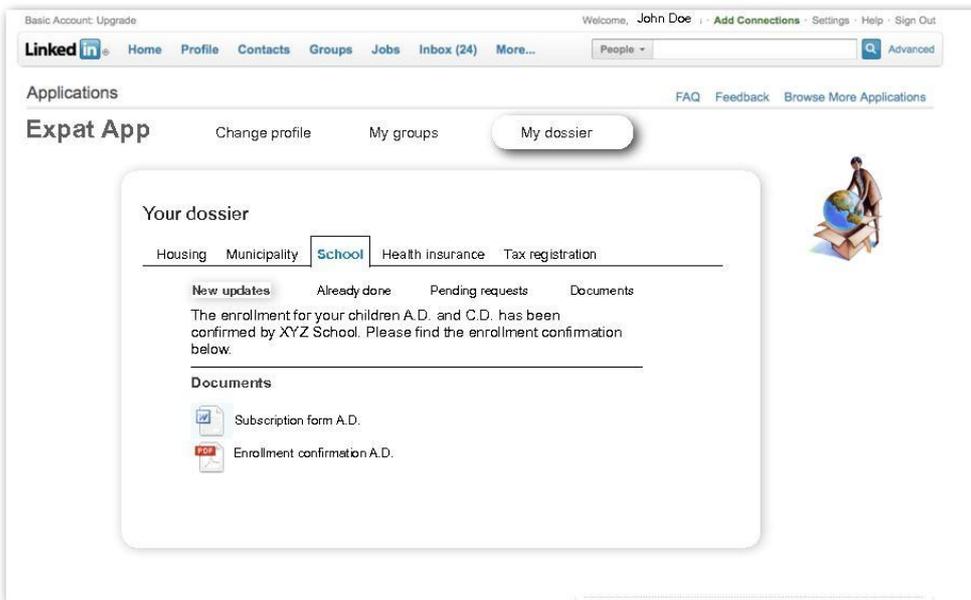
The screenshot shows the LinkedIn Expat App interface. At the top, it says 'Basic Account: Upgrade' and 'Welcome, John Doe'. The navigation bar includes 'Home', 'Profile', 'Contacts', 'Groups', 'Jobs', 'Inbox (24)', and 'More...'. Below the navigation, there are links for 'FAQ', 'Feedback', and 'Browse More Applications'. The main heading is 'Expat App' with sub-links for 'Change profile', 'My groups', and 'Prepare your stay'. The 'Your dossier' section is at 3/3 steps. The current step is 'Health Insurance', with other steps being 'Housing', 'Municipality', 'School', and 'Tax registration'. The text reads: 'Initiate take over of medical dossier from my health insurance company to a new health care insurer of my choice via the secure European eHealth network'. A 'Start Procedure' button is at the bottom.

...make sure that your health insurance and personal medical records are properly registered in your new country of residence...

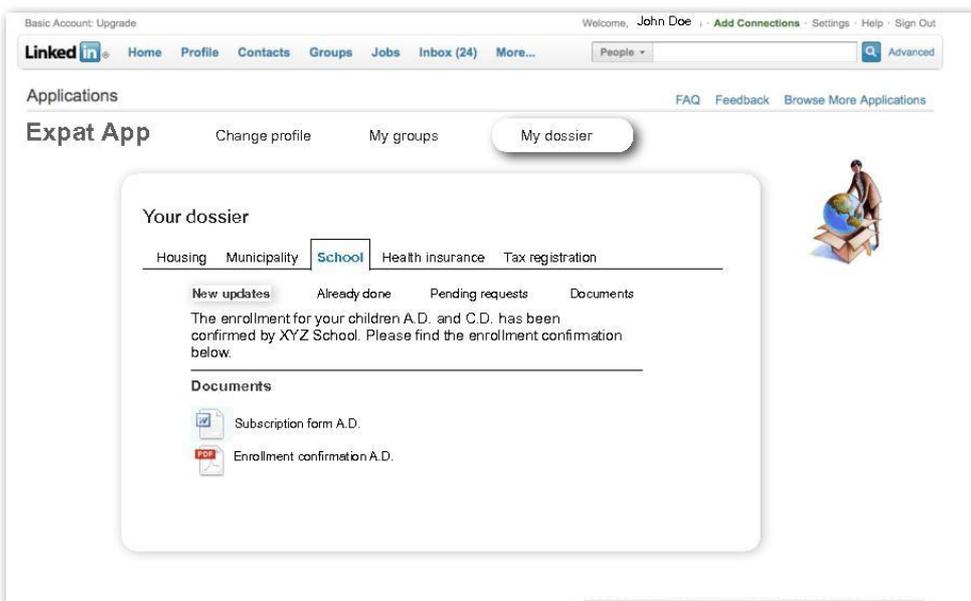


The screenshot shows the LinkedIn Expat App interface. At the top, it says 'Basic Account: Upgrade' and 'Welcome, John Doe'. The navigation bar includes 'Home', 'Profile', 'Contacts', 'Groups', 'Jobs', 'Inbox (24)', and 'More...'. Below the navigation, there are links for 'FAQ', 'Feedback', and 'Browse More Applications'. The main heading is 'Expat App' with sub-links for 'Change profile', 'My groups', and 'Prepare your stay'. The 'Your dossier' section is at 3/3 steps. The current step is 'Tax registration', with other steps being 'Housing', 'Municipality', 'School', and 'Health insurance'. The text reads: 'You can register for the local tax services of your new municipality. Please start the procedure below.'. A 'Start Procedure' button is at the bottom.

...and register yourself with the local tax authorities.



Once you have finished preparing your stay, you can consult your personal file in the Expat App. You will be kept informed as new updates are posted that apply to you.



You will also find the things you've already done, the pending requests and the documents you need to keep.

**To sum up...
with the Expat App:**



you get to know other expats

you can activate all administrative procedures, such as registering with the municipality, finding a school for your children, registering with the local tax authorities, managing your healthcare files and other services

you have one single application both for preparing your stay and for managing your official file afterwards

**A future scenario
regarding a Trans-European
Health crisis**



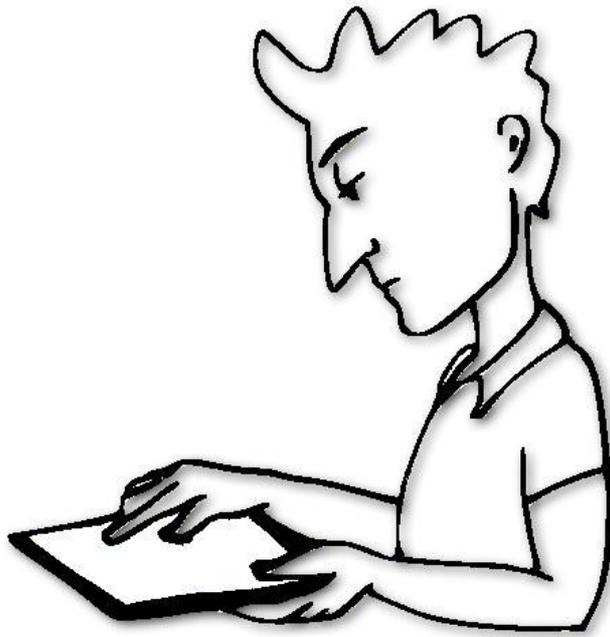
You are going to spend some time in another member state and are preparing for your departure.



A breaking news item pops up on your interactive television, announcing a new swine flu virus break out.



It has already been reported in the neighboring countries.



You want to check if it has an impact on your departure and your plans for the coming weeks in general and take your iPad.



You check out the new European Swine Flu App, consulting the latest news feeds in a message stream.



The breaking news item is at your disposal on demand, featured by the European Crisis Channel.



A lot of information is available surrounding healthcare, travel, medication, special instructions etc.



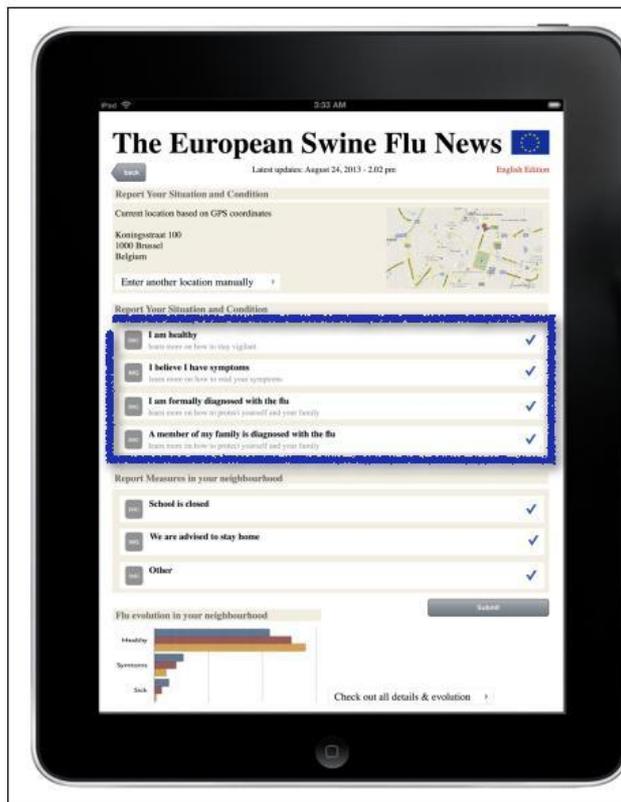
You can access the situation in your local neighborhood or anywhere else in Europe. This way, you can stay informed and adapt your travel plans as required.



You can use the social function in the app to report both on your own situation and on the effects of the outbreak on the local community.



The iPad automatically recognizes your location, but you can modify this if you want.



You indicate what your current health condition is as well as your family's.



If measures were taken in your neighborhood like schools closing, you can report that too.

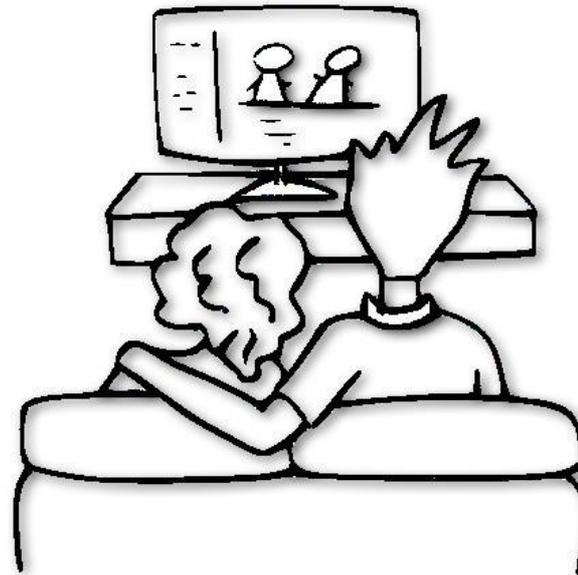


This social function allows citizens to help update the data on the situation in Europe.

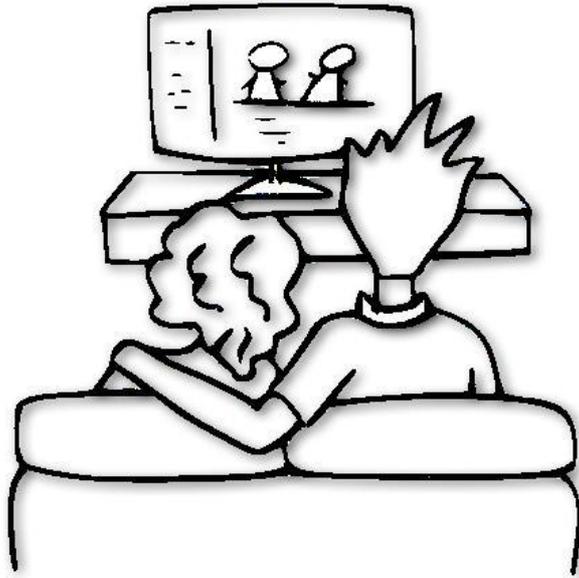


The flu evolution and measures taken in your neighborhood are presented in a comprehensive visual way in the app.

You can always switch to another region in Europe to check the situation there.



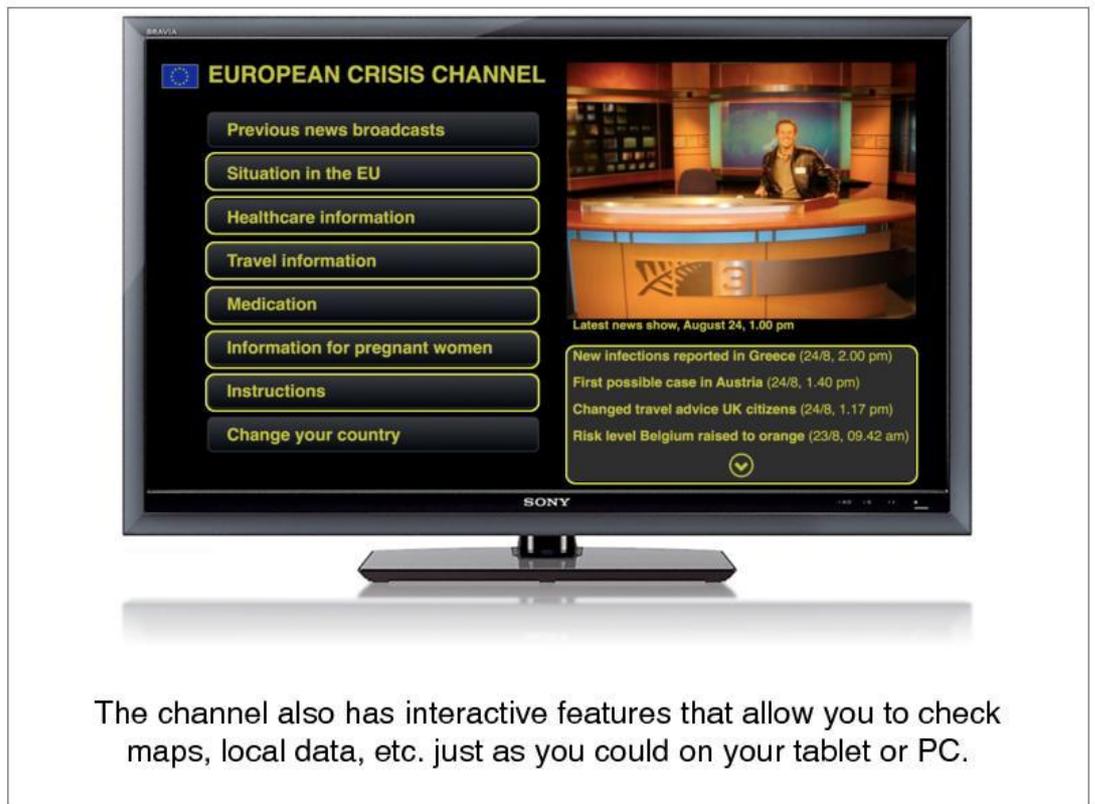
When your family members arrive at home, you switch on the TV for a 'common' experience.

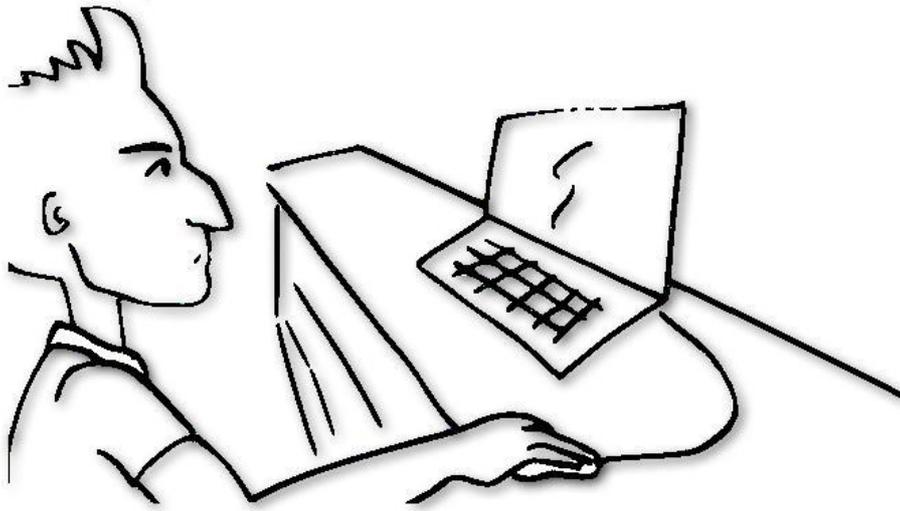


The entire family is interested in the evolution and gathers around the TV-set.

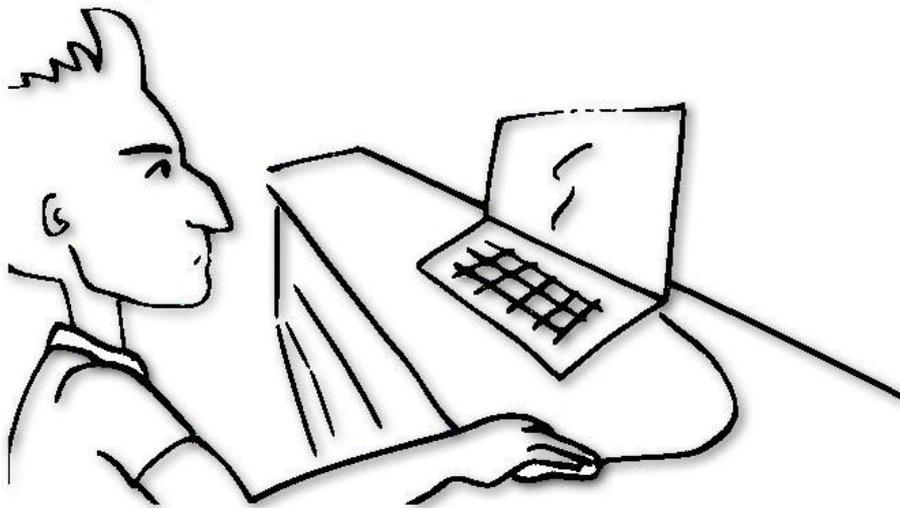


The European Crisis Channel broadcasts the latest news edition in a loop.





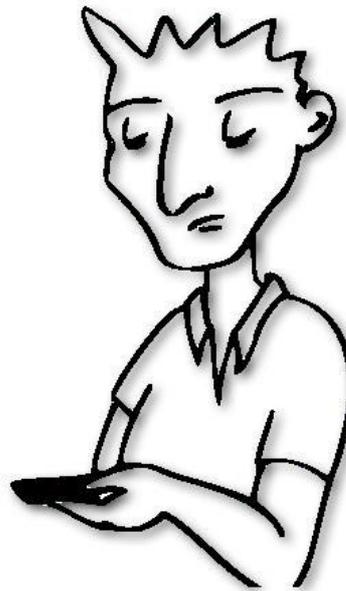
While your oldest child is playing with the iPad, you take your laptop to check out the updates on the European Swine Flu website.



In order to stay informed, you subscribe to the SMS alert service.

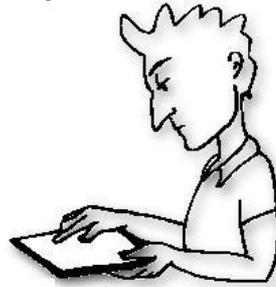


The closer your departure date approaches, the more you need up-to-date, precise and detailed information.



For the up-to-date info, you are pleased with the SMS alert service, that constantly pushes all relevant updates to your mobile phone.

To sum up... with the European Swine Flu app and channel:



you have up to date information immediately at hand via different channels that are tailored to your information needs

'older' news is at your disposal on demand

interactive services and data keep you informed about the spreading of the flu

you can participate in creating an up-to-date database by reporting your own situation and the effects of the outbreak on your local neighborhood

8.2 Annex 2 - User experiments

A series of laboratory-based experiments investigated citizens' information and service needs during a range of different events, problems, or dilemmas. It explored the effectiveness of different kinds of governmental online provision in meeting those needs. The experiment assessed how citizens responded to a range of life events involving more than one Member State in an on-line setting.

In terms of the user behaviour, it was possible to observe:

- Users' expectations of the sites and their success in finding information.
- A comparison between users' behaviour when they use a one-stop shop style government portal and open search engines.
- Portals' use by different user segments (specifically younger 'digital natives' and older groups).

The experiments took place at OxLab in the UK during summer 2010. A total of 130 persons participated³³. The individuals were given one hour to complete the experiment. They were provided with four scenarios and asked to 'think themselves into' the situation described. They were provided with a computer screen and a custom-built interface, which guided them through the experiment. For each scenario, the users completed a brief pre-questionnaire and a full post-experiment questionnaire. The language used in the experiments was the English language.^{34,35}

- Differences in level of Internet skills were significant.
- Users used four distinct strategies to find information.
- The type of portal used influenced the users' search strategies.
- Users who found answers on private sector sites and Wikipedia answered questions more quickly than those finding them on government sites.
- Users' behaviour differed according to whether the situation was an emergency or not.

People's use of eGovernment services

For each of the four scenarios that were introduced to users, the user experiment observed three main effects with regard to sites: they identified sites that people found difficult to navigate, sites that users did not find when looking for related information, and places where information was inconsistent or not easily available.

When searching government portals, two tendencies emerge. Either, people do not find the specific task-related information they need on the portal. They therefore waste time and attention on complex navigational paths, and eventually have to resort to open search. Alternatively, they use open search but do not come across the portals themselves.

The experiment indicates that people do not think about life events as a 'lump', but rather disaggregate tasks and treat them separately. When people contemplate life events in the 'real' world, they also appear to perceive life events as sequences, and break them down into tasks that need to be performed at different times.

³³ For ease of reading, we use the expressions 'person' or 'user' in this description of the user experiments. However, since these were formal, social science, laboratory-based experiments, the researchers themselves tended to use the term 'subject' to refer to the people who took part in the experimentation.

³⁴ Around 50 of the users found other language sites and used machine translation engines to fulfil their capacity to read them and understand them. The numbers were not statistically significant.

³⁵ It is possible that the use of the English language only in the experiments, and the fact that the users were directed towards searches of sites in the English could have had some influence on the outcomes of the experiments. Similar experiments with multiple country searches, multiple European nationalities, and with websites with different available languages could in future be useful.

The fact that the people involved in the user experiment approached the life event scenarios in a disaggregated, task-specific way may well be the key to why there were portals on which users found answers to questions more slowly.

Preliminary conclusions

The key preliminary conclusion from the user experiments is, therefore, that people have a **disaggregated, search-oriented response to life events**. They work out specific information items that they need, they look for them, and they find them in a wide range of sources through the use of a broad variety of strategies. They use search engines and specific search terms and often find information from non-governmental sources. When they are left to employ these strategies freely by themselves, they tend to find information more quickly.

Design implications which follow from people's use of eGovernment services

A set of preliminary conclusions result from the set of user experiments. These reflect the current experiences of users when trying to resolve life event information-seeking on government portals. The observations about the difficulties involved in these circumstances enable observations about the kinds of enhancements that can occur through the use of Web 2.0 and Web 3.0 approaches.

Preliminary user experiment conclusions

The current state of online provision of information by government does not always suit this kind of user technique. The organisation of information provision on government portals tends to be less than optimal in terms of users who seek to find information that is needed in relation to a specific life event. The current design of eServices on many government portals does not seem to meet the contemporary requirements of users.

A new approach would involve using **a range of Web 2.0 and Web 3.0 strategies**. The Web 2.0 strategies include recommender and reputation systems; user testimonials; feedback facilities; and linking to social networking and data sharing sites. The Web 3.0 initiatives are composed of the Semantic Web, the 'web of linked data' and open government directives; complex search mechanisms; and personalised browser technologies. In short, these new approaches would involve exploring the **full scope of the Internet and Web**. This strategy is described as **an atomic, individualised approach to eGovernment**.

8.3 Annex 3 - Online user survey

An online user panel survey was conducted during autumn 2010. It was based on animated video mock-ups that demonstrated a number of novel Web 2.0-based eGovernment service applications related to each of the four life-event case scenarios.

The target of the survey was: N= 3,000 respondents, including:

- Two groups of Internet users (N=1,500 each)
 - Students aged 18-30 years
 - Professionals aged 30-50 years.
- Three countries: Austria, the Netherlands and Sweden (N=1,000 each)
- Gender balance and representation of educational levels and professional occupations
- Four life-event based scenario applications (N=750 each)
 - Scenario 1 (studying abroad) => 750 students
 - Scenario 3 (working abroad) => 750 professionals
 - Scenarios 2 and 4 => mixed, students and professionals.

In each of the three Member States, online interviews were performed with 1,000 respondents. The survey was addressed to two main target groups, students and working professionals. These target groups were selected by taking into consideration the four life event scenarios. The sample included 500 respondents in the 18-30 year old age group who were active Internet users (students in higher education). A further 500 working age professionals in the 30-50 years old age group, who were also active Internet users, were surveyed in each of the three Member States.

Table 1 below provides an overview of this approach and the actual survey sample on which the results presented in this report are based.

Table 1, User survey sample

ONLINE USER SURVEY	Target group 1 : Students higher education between 18-30y		Target group 2 : Employed professionals between 30-50y	
	Scenario 1 : Studying in another EU Member State	Random : Scenario 2 : Trans-European Healthcare Scenario 4 : Stolen valuables emergency	Scenario 3 : Working in and relocating to another EU Member State	Random : Scenario 2 : Trans-European Healthcare Scenario 4 : Stolen valuables emergency
Austria	250 respondents	250 respondents	250 respondents	250 respondents
Netherlands	250 respondents	250 respondents	250 respondents	250 respondents
Sweden	250 respondents	250 respondents	250 respondents	250 respondents

8.4 Annex 4 - Interviews with key stakeholders

This annex describes the background, approach, content and orientation, to the conduct of a series of interviews undertaken in the context of this study with a group of third party, industrial, and service provider stakeholders.

8.4.1 Background

The Fifth Ministerial eGovernment Conference (2009) declaration calls for the delivery of eGovernment services in the most effective way. Among the criteria, **third parties** are requested to collaborate on the development of eGovernment services, and **stakeholders** are to be involved in public policy processes.

Thus, third party collaboration was an integral component of the four different scenarios that have been developed for the study, bringing government services together with privately provided services in one solution. **Various third parties are involved in the four scenarios.** They include a number of public authorities: a local police authority, an embassy, a municipality, tax administration, schools, and universities. The private sector players involved might be an airline, a bank, a health insurance company or agency, housing services, employment services, and broadcasting companies or corporations.

The study team therefore aimed for a **balanced approach** towards the interviews in order to receive a range of views from the diverse actors based on the four scenarios. A number of experts with in-depth knowledge concerning the delivery of eGovernment services were also interviewed.

8.4.2 Approach

The methodology applied to undertake these **stakeholder interviews** involved a two-step approach. First, an **online questionnaire** was developed to which stakeholders were invited by email to respond. Second, as a result of those responses, **in-depth interviews** were held to deepen the understanding of the responses.

8.4.3 Content and orientation

The interviews were oriented towards such **topics** as:

- ✔ The perceived benefits of Web 2.0
- ✔ Enhancing cooperation between administrations and across borders
- ✔ Key enablers such as service-oriented architecture
- ✔ Elements that need to be in place to facilitate the development
- ✔ The respective roles of both public sector and private sector
- ✔ Incentives
- ✔ The length of time that implementation will take, and
- ✔ Life events

8.4.4 Life Events

Given the importance of life events to this study, these findings are summarised here.

Generally, the respondents viewed life events approach as a **useful and valid concept** in grouping a set of services. It offers a **coordinated and efficient means** to address relevant needs of different population segments. In addition, the approach **fits the citizens' logic** and is one of the missing service approaches that users expect (especially young, digitally-literate citizens). Life events enable governments and citizens to learn about the **integration** between different services. The approach requires a **constant adaptation** of the four scenarios based on the citizens' change in behaviour.

However, experience in some European Member States (such as Denmark) shows that a **mixed approach** which uses both life events and subject topics as alternative access routes is useful. Although life events are very useful for many people in many situations they can also be obtuse and difficult to use in others. In particular, it is important to use or develop **powerful search engines** (including new semantic search tools): more and more users will access services via a search engine rather than making a detour through a portal, however good that portal is.

Life events may not be understood across the EU as they do not necessarily address **cultural differences** across EU Member States. Life events scenarios should only be developed around topics which are of relevance to a sufficiently large part of the population. Overall, services should be **demand-driven**: they should take into account that citizens may want a simple service, and use dedicated websites rather than referring to a full life event.

In summary, the life event paradigm **will remain relevant** under the condition that it is demand-driven and user-centric and address issues which are close to the citizens' expectations and are approached in a user-friendly way. Life events are perceived as a cost-effective way for governments in addressing the needs of large groups of population segments: it enables governments to enter into communication with citizens.

However, the respondents consider that a Web 2.0-based life events approach will only be successful, if it is promoted. Governments should develop services based on the **real citizens' needs** rather than on any current, temporary trend. A **careful analysis of the effectiveness of such services** must equally be undertaken.

8.4.5 Conclusions

In conclusion, the interviewees have **responded favourably towards the scenarios** that were presented. **Web 2.0** is viewed as an important driver for bringing about these benefits of a user centric eService delivery. The development of such scenarios is viewed as technically possible already. However, they are considered to take a number of years to implement: this is due to the fact that the public sector has a number of clear steps to take in order to put the appropriate conditions and infrastructure in place.

Government plays an essential role in facilitating the creation of a number of prerequisites: these include the opening up public data, providing accessible and re-usable public services within a **service-oriented architecture** and an appropriate legal and standards framework (including with reference to data protection and privacy). In other words **interoperability is an essential enabler** for such future eGovernment services.

For the private sector, the development of new services based on re-usable public services and data requires a **clear economic incentive**. Achieving a **low threshold to accessing and using public services** to create new value-added services is equally important.

It is anticipated that public demand for **Web 2.0-enabled services** that provide a complete handling of an 'event', activity, task, or responsibility will rise considerably in the near future. In this domain, the role of government in building up political commitment and showcasing a clear business case for the private sector to collaborate is vital

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