Towards an eID Pilot: a compilation of background information on potential applications[†]

[†] This document is intended purely as a discussion paper exclusively for the use of the participants to the "eID workshop 28 February 2007" held in Berlin. Although every effort has been made to ensure the accuracy and relevance of the contents, they do not in any way represent the official position or policy of the European Commission.

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INTRODUCTION

This discussion paper is intended as a stimulus for discussion and reflection in the process of selecting an appropriate set of applications for the future eID pilot activity. It can be used to guide discussions towards identifying priority application areas for the pilot. It is structured as follows.

- In the first section an overview of the pilot activity is presented, including:
    - the general context;
    - the working definition of the pilot activity;
    - a detailed description of the key characteristics of the pilot activity effort, including:
        - Selection criteria,
        - Expected outcomes,
        - Key requirements to be met,
        - Key success factors, and
        - Architecture.
    - The section concludes with a structured presentation of 4 selected example applications, illustrating the use of eID in the application context, and a comparative assessment of the benefits derived

  The purpose of this section is to illustrate key steps leading to the desired outcome of the selection process.
- In the second section, abbreviated descriptions of a number of other possible eID applications identified in the PEGS report by Capgemini for the IDABC program are given. The purpose of the inclusion of this list is to illustrate the variety and scope of possible applications that should be considered by the participants for selection.
- In the third section is provided a more detailed description of two candidate applications, pre-selected (according to application of the selection criteria as given in the first section) for illustrative purposes, as possible “killer applications” for the use of eID. The purpose of their inclusion is to stimulate further reflection on:
    - Maximizing the benefits of the application of eID in a specific context (and how those benefits can be extended as the scope of the application increases), and ultimately
    - Identifying applications providing a “best-fit” to the selection criteria.

1. APPLICATIONS FOR AN eID PILOT

1.1 Context

The eID i2010 roadmap paves the way towards a pan-European recognition of electronic IDs (eIDs). The global objective is the implementation of an EU wide interoperable system for recognition of eID and authentication that will enable businesses, citizens and government employees to use their national electronic identities in any Member State. This will facilitate for instance, company registration or procurement, mobile working, social security, taxation or health reimbursement. It will open the door to new business opportunities, advance the internal market and facilitate the free movement of citizens.

1.2 A large scale pilot

Support to the eID roadmap will be provided by means of one pilot action in the CIP/ICT PSP (Competitiveness and Innovation framework Programme / ICT Policy Support Programme) context based on a "Pilot A" funding scheme.

The pilot is supposed to be composed of several applications exposing the main eID functionalities.

The pilot will have duration of 3 years, with the 2 first years mainly focusing on development while the last year will showcase a solution operated in a real life environment.

1.3 Pilot main characteristics

1.3.1 Selection Criteria

The pilot should fulfill a number of very important criteria with regard to demonstrating the positive impact of the introduction of eID (and related elements) into the particular scenario; the criteria, in order of priority, are as follows:

- High impact in terms of the number of persons in the society potentially affected by the changes in a positive way, and the frequency of occurrence of the scenario
- The resulting changes/improvements should be seen as a public benefit
- Technology coverage should be interesting but neutral as to implementation
- Functional coverage should be broad, involving interesting aspects of identity, authentication, authorization/mandates, data protection, etc.
- Cross-sector coverage, concerning a process that involves administrations, citizens, and businesses
- Cross-Border coverage, demonstrating the benefits to such activities.
- Should provide visible, clear and concrete benefits to citizens, businesses and administrations
- Should be quick to implement and hopefully provide a "quick win" (being not too complex to implement, and in a manner which isolates the technology and data sets in question from other technologies and data sets concerning other activities in other sectors of activity), and possibly lead to a series of other quick wins, by extension
- Should provide an opportunity to collect significant feedback

1.3.2 Expected outcomes

The pilot is expected to

- contribute to accelerating the deployment of eID for public services, while ensuring co-ordination between national and EC initiatives in the field and support federated eID management schemes across Europe based on open standard definitions where appropriate.
- test, in real life environments, secure and easy-to-use eID solutions for citizens and businesses, in particular SMEs, and government employees at relevant levels (local, regional, cross/ national level).
- deliver value to the eID i2010 roadmap through lessons learned.
- comply with data protection regulations.
- demonstrate efficiency by improved timeliness with higher volume of transactions/ operations processed, and significantly reduced number of incidents.

1.3.3 Key requirements

An overwhelming main requirement of the pilot is to consider a model of interoperable electronic identity mutually recognised in all Member States, while keeping their systems and practices thus ensuring subsidiarity principles. Every MS must have the ability to adopt its own technology, policy, and platform. Member states already have sometime eIDM infrastructure. The solution will take into account existing solutions available amongst the authorities participating in the pilot.

A second requirement is that the key activities identified in the roadmap should also be verifiable in the pilot. This covers aspects such as the adoption of a common terminology and conceptual model, the establishment of common specifications, the legal aspects, the study of multi-level authentication, the forthcoming standardisation initiatives, the study of a mandate/role model and eSignatures. Relevant work at EC level will be taken into account and conversely, the pilot will provide “lessons learned” feedback to the activities initiated in the context of the i2010 eID programme.

1.3.4 Success factor

1.3.4.1 Involvement of members states

The consortium must involve public authorities that already operate or are in the process of implementing electronic ID based services and that are ready to implement cross-border authenticated services. A large number of member states participating to the pilot is a clear indication of the consensus that could be built as result and of the corresponding interoperability.

Member State entities responsible for the definition of national standards and systems for electronic identity are expected to exploit the results of the pilot in view of work towards an EU wide common eID specification.

The proposed applications should be supported by a viable business case resulting from previous studies. The objectives and processes supported by the corresponding applications should already be subject to a consensus.

1.3.4.2 Involvement of industry and academics

Participation of industry in the IT implementation is encouraged, although the pilot results must be freely accessible without discrimination to all interested parties in the EU. The common specifications developed by the pilot shall be openly available for all Member States.

1.3.5 Architecture

The pilot should be architected around an integrated solution providing cross-border recognition of eID and authentication. Some relevant services part of this architecture shall be tested in real life through the development of specific applications.

The pilot will be based on an interoperability layer and federated eID management schemes characterised through common specifications including a reference architecture.

1.3.6 The proposal

The pilot proposal shall be structured around 3 or 4 applications showing significant benefits.

The pilot proposal shall define the framework for the pilot implementation, in particular:

1. Result-oriented parameters including:
   - relevant services and functionalities among: Identification, Authentication, Authorization, Electronic document recognition, Electronic document transfer, Mandate situation, Signature, Cross domain interactions …
   - domains covered (social security, tax, customs, …)
   - parties involved such as service and solution providers as well as beneficiaries,
   - other real life environment conditions

   The proposal shall indicate the number, the nature and the technical maturity of services for citizens and businesses that will be part of the pilot, and indicate the number of expected users and the expected volume of transactions during the pilot for each service.
2. Pilot must describe a credible architecture (e.g. facility for mutual recognition)
3. Practical implementation parameters including:
   - legal and organisational constraints,
   - IT "building blocks"
   - other technical parameters
4. Criteria for evaluation/ measurement for success.

The resulting solution should have the following characteristics

- simplified access to the public services addressed
- reduction of administrative burden, in particular for SMEs and cost reduction for service providers
- interoperability at the technical, semantic, organisational and legal level
- high degree of scalability and easy replication and transposition of the services in other contexts such as a different MS, a different institution, a shift from local to regional dimension, etc.),
- smooth inclusion of additional services within different domains

The pilot proposal shall be first implemented, tested and made operational in at least six Member States.

The pilot proposal shall cover applications cases related to the administration, business and citizens

The pilot proposal shall demonstrate an ability to run in live environment within 2 years.

1.4 Example Applications

Examples of applications that could be part of a pilot are described hereunder.

1.4.1 Mobile worker

1.4.1.1 Description

A mobile worker is a person who is normally employed in one country but is sent temporarily to another country to work there for his undertaking. The maximum period for posting is 12 months; in exceptional cases it can be extended up to 24 months. A mobile worker who normally works in country A and his send to country B is:

- Insured in the country A,
- Paying contributions to the social security system of country A.
- Entitled to all healthcare benefits in country B, regardless of whether he reside in that country
- Entitled to family benefits from the country A, regardless of which country the members of his family reside in.
- Entitled to unemployment benefits in the country A. However, if he transferred his residence to the country B, he could also be entitled to unemployment benefits there.

Before moving, the worker should apply for forms E101 and either form E106 or the European health insurance card.

1.4.1.2 Current issues

Most of the poster workers felt uncomfortable when thinking about what might happen when getting an accident, losing their job or retiring.

To apply for social security benefits in one country, a ‘mobile’ citizen needs to:

- Contact their former employers,
- Contact their native public administrations. Sometime it require to go physically in their native country
- Engage official translator

The delay needed for the renewal of certain EU forms takes 2-3 days in some countries and up to 1 month in other countries although the local administrations have already all the relevant data..

1.4.1.3 Using eID

Pilot could include the two following applications based on eID that help the mobile workers:

- The electronic health insurance card. The goal of this application is to replace the paper forms E111 by electronic transfer of data carried on either an electronic European health insurance card or on one of the existing national electronic cards.
- Extend to multiple MS the Guide application that automates the treatment of the E101 form. This is done by the usage of electronic documents and the interconnection of MS administrations.

1.4.1.4 Added values

The Citizens will no longer have to apply to the relevant institution for a new form before any temporary stay in another Member State.

The E101 form can be filled online by the **business or citizens**, avoid going physically to the administration office

Health care providers will no longer receive forms which are badly completed, electronic system will eliminating the manual steps in the procedure.

Administration processes will be automated which will reduce cost, time, risk of error, rejection of requests for reimbursement, fraud and abuse.

Usage of electronic form will resolve the format and language issues.

1.4.2 Permits and Licenses

1.4.2.1 Description

When citizens are moving to or living/working in another country need to apply locally for residence/work permit and they sometime needs to obtain from their native country specific documents such as

- birth certificate/extract of a birth certificate;
- renewal of a driving license;
- married/divorced certificates

1.4.2.2 Current issues

Countries have different procedures to obtain permits & licenses, it is very difficult and time consuming for a citizen to get in contact with the authorities and find out the right procedure. Sometime the procedure is even not known or not feasible (need to prove that you have a job before having a residence permit that is needed to find a job).

There are languages and format issues, some countries do not recognize the documents from some other countries. Citizens need to engage official translator.

Citizens sometimes need to go back to their native country to pick up documents.

1.4.2.3 Using eID

Pilot could include an application based on eID that help ‘mobile’ citizens, this application could consist in:

- Provide to administrations the possibility to contact each other in order (or give each other complete access to their information) in order to obtain relevant documents.
- Creation of a unique European identifier for each citizens, which is the base for such applications
- Creation of a European electronic identity that contains all valuable and relevant personal data of the ‘mobile’ citizen and that can be automatically registered when one presents himself at a public administration.

1.4.2.4 Added values

The creation of a transactional service will solve most of the citizen issues:

- To automate the procedure there will be a need for document, simplify and standardize them.
- Transactional services will be able to resolve the language and format issues.
- Transactional services will allow citizens and/or administration to require documents without moving to their native country.

1.4.3 Electronic declaration of foreign workers

1.4.3.1 Description

Member States intend to modernise the information systems for the monitoring and controlling of migration by the social administration. This means the setup of systems where companies and/or individuals can declare the employment of a person in another country than the one where he resides. The idea is that companies as well as people first enrol and than do a declaration of their professional services abroad. The goal behind this is to make sure that all benefits linked to the employee's status continue to be available.

Seconded employees are considered here in a broad sense as all foreign employees who provide services locally on a temporary and/or part-time basis, whether they are engaged abroad and sent locally or whether they are simultaneously employed by a foreign employer in the local country and in other countries.

This corresponds to a prior mandatory declaration for each foreign seconded national by obliging all local or foreign employers employing a worker temporarily in the country. This means an obligation to complete an electronic form. In a first stage, this notification would be limited and only cover basic details required for employment: identity of the employee and employer, place of work, kind of employment, contract duration, nature of the work ….

The notification duty would not only apply to the employer, but also to the user, i.e. the company who has contracted with the employer. The user shall inform the authorities if the notification duty has not beet performed by the employer.

In a second stage, the system could evolve to a unique electronic counter for obtaining work permits, professional cards, establishment permits and residence permits.

1.4.3.2 eID impact

Such application requires strong identification of the EU citizens who present themselves on the website.

A set a proxies could also act on behalf of companies and to file the declarations for foreign employees. A clear mandate should be established.

1.4.3.3 Added value

Such initiative will reduce the administrative burden

- for employers temporarily having recourse to foreign staff (one form)
- for the administration in charge of verifying whether or not the employer did actually comply with the law.

- For the employers by allowing the creation of exemptions to the obligation of keeping social documents in the local country (payslips, individual account …) provided similar documents are required in the foreign country.

The collected information will become available and exchangeable between the different authorities in charge of work permits, professional card and residence permits.

In the longer term, this allows a "one shop" approach: an employer could handle all employment formalities only by filling one form.

1.4.4 Electronic Customs

1.4.4.1 Background: the EU's Electronic Customs project[‡]

The EC's "electronic customs" project is an ambitious, multi-faceted, long-term initiative aimed at transformation of the operations of the customs administrations of the member states of the EU towards convergence target in which they all act in concert as if they were a single administration, with the objective of facilitating trade while enforcing regulations protecting EU citizens from hazardous and illegal trade, in an electronic, paperless environment.

Customs administrations (CA) operate a number of IT systems to fulfil their treaty obligations with respect to citizens, the trade and to the other CA's.

The ongoing electronic customs project has identified a number of "gaps" between the environment currently prevailing in the ensemble of Member States Customs Administrations and the convergence targets identified in the various feasibility studies conducted.

Among the most important of these identified gaps are the lack of existence of a **UTR** or so-called Universal Trader Reference; There is no EU-wide standard for the identification of international traders; for the moment, the national administrations have individual schemes for identifying traders during customs transactions (in UK for example, the national VAT number is used).

The introduction of an EID for the UTR would (in some cases) allow or (in other cases) facilitate the introduction of a number of other elements necessary for progress in the development of electronic customs to go forward, including:

- Single European Authorization (SEA),
- Single Electronic window (SEW),
- Single European Guarantee (SEG),
- Harmonization of simplified procedures, etc.

1.4.4.2 TRANSIT SYSTEM

Traders are required by law to make declarations on goods they import into or export out of the EU, or which they transit through the EU. In the case of transit, they seek suspension of payment of taxes and duties based on the fact that the goods are just "passing through". To get this suspension a transit declaration has to be made.

[‡] A detailed description of this initiative is beyond the scope of this document, but a number of definitive references can be given to source documents produced and maintained by EC DG-TAXUD;

The EU operates a trans-European IT system that manages the transit of goods through any of the countries which are members of the CTC (Common Transit Convention) which includes the Member States of the European Union and a few other selected countries. NCTS (acronym standing for New Computerized Transit System), is a trans-national system used to manage this transit (i.e., not import or export) of goods through the EU MS.

1.4.4.3 Present scenario

A transporter arrives at border post with a shipment destined outside the country; in order to have duty/tax payment suspended, the transporter makes a transit declaration, supported by a bank guarantee, and supplying at that time any other necessary documents which may include a variety of licenses or certificates, etc., depending on the goods being shipped, and the final destination. The transporter also has to demonstrate authorization to make the declaration for the owner of the goods. Finally, the shipper has to have verifiable financial guarantee arrangements in place, intended to cover the taxes/duties/penalties that would be due under importation.

Under the current conditions, at the customs office where this declaration is made, there is a manual verification of the key information in the declaration including identity of shipper of the goods, the existence and validity of the guarantee in the country of transit (required for the transit clearance), and the authorization of the transporter, and a possible control of the shipment/container itself.

Once clearance for transit has been granted, some documents are produced and are required to accompany the goods in transit and presented to customs officers at the proper time and place ("AAD" - Accompanying Administrative Documents); the shipment then continues on its way until in the normal case it exits the country for its final destination.

NCTS is the EU message-passing system, used by the Customs offices in the CTC Member States, which is used to track these actions and movements, and partly automates some of them.

1.4.4.4 Future Scenario

The transporter can optionally make an "expedited" declaration at the customs office with an electronic identity token which contains a number of interesting elements that are needed for the declaration, including:

- Electronic identification (eID) of the shipper (owner, etc.) of the goods, corresponding to the UTR
- Digital Signature (DS) of the shipper authorizing the transporter (truck driver, etc.) to make the declaration
- EID for the transporter (a person), and his DS for the declaration he is making
- Other optional accompanying declaration-related information, which may include any of the following:
  - Electronic certificates of origin of goods
  - Electronic licenses for the activity (export or whatever);
  - Other information as relates to the declaration/SAD
- Other optional components (further study required) could also include:
  - Digitally signed information relating to the guarantee
  - Electronic items added to the token carried by the transporter at the Customs Office corresponding to selected parts (or all) of the AAD.

The pilot application scenario includes the following elements:

- introduction of eID/UTR concept for the trader/shipper,
- automated verification of the identity of the shipper,
- automated verification of the identity / authorization of the transporter, and
- (optional) partly or totally automated verification of the existence/validity of the guarantee;

These partial or total automations will result in significantly reduced time for the declaration/transit clearance procedure. The transporter inserts a card or token into a reader at the customs office, and a declaration either partly or completely made in automated way; Unless the information on the goods in the container are stored with the eID, the declaration will still have to be completed by the transporter (see below on pre-declaration). The system makes an automated decision for control or timed release (a release with a delay of some minutes to allow a customs officer to review the situation and make a final decision whether to let the shipment go through or to inspect). Final clearance is still a decision of a customs officer who makes a judgment based on his personal knowledge and experience.

There are also some optional extensions/variations to the business case that could be considered at some point, including:

- A link to a previously made pre-declaration (i.e., via a remote system and alternate interface, and made in advance of the arrival of the physical goods at the customs office) could also be envisioned, providing an advance prepared electronic description of the goods in the container.
- A link to Risk Analysis system could be envisioned that would made more fine grained channel recommendations on the shipment (red-channel: complete inspection, green channel: release, yellow channel: document controls)

Key added-values/benefits of the extension of the current system to include eID:

- **Trade facilitation** specifically significantly reduced time for transit clearance at entry and at control points; furthermore, introduction of the UTR (which doesn't exist as yet), would facilitate further developments in electronic customs
- **Anti-fraud**; a key risk in this transaction is the making of invalid declarations by unauthorized persons; the introduction of DS/eID for the transporter could serve to provide increased confidence in identity of the transporter and his authorization to the Customs officer who has to make the final clearance decision

1.4.4.5 Expected results of the Pilot project

It is expected that in the course of this pilot application there will be a number of issues confronted and lessons learned, relating to:

- Technical design of the data (eID's and possible associated documents) stored on the smart card/token (UTR, DS/authorization for transporter, optional certificates, licenses, links to pre-declarations, etc.) on a smart card/token for use by a transporter;
- Technical means of how will the data be put on the cards by shippers/traders in a secure and trustworthy manner (at a remote location)
- How will the data be used in the automated/expedited process, especially as regards the verification of the existence/validity of the guarantee

- Evaluation of ROI: how much facilitation/improvement on average results from the typical business case/transaction in relation to the effort to extend/adapt the existing systems

1.4.4.6 Notes

Another option consists of extending another existing pan-EU Customs IT system to include use of EID for UTR, namely the Export Control System (ECS). Details on this possible pilot application are included in the appendix.

Another note is that additional scenarios can be elaborated dealing with the pathological cases of lost/stolen tokens/smart cards.

1.5 Assessing the benefits resulting from the pilot

The various applications included in the pilot should provide a good coverage of the typical functionalities and scenario that would be relevant for the eID roadmap. An brief overview of the coverage provided by the applications described above is provided in the next table.

	Permits and Licenses	**Mobile worker**	**declaration of foreign workers**	**eCustoms**
Rapidity to deliver first results (and therefore provide lessons learned)	+++	++ (GUIDE feedback)	+	-- (more complete & complex case, however underlying studies already performed)
Identification	Citizens identify themselves when contacting administration	Country that receives E101 form identifies the mobile workers and the company who transferred him	Company that hire foreign employee identify them	Shipper (UTR) and transporters (such as truck drivers)
Authentication	Authentication between foreign administration An administration authenticate one of its citizen through a foreign administration	Authentication between health care administration of different countries Authentication between citizens / company and their native health care administration Health care providers authenticate citizens based on their electronic card	Administration web site of a country authenticates • foreign citizens working in this country • company that post foreign citizen in this country • company that hire foreign citizen in this country	Custom administration authenticates the goods transporter, and the shipper.

Authorization				Custom administration provide authorisation based on goods transporter and shipper Ids Goods owner signs documents to authorise the shipper to transport the goods Bank authorises the use of a guarantee in the country of transit
Electronic document recognition	Administration recognise electronic documents provided by foreign administration	Administration recognise electronic documents provided by companies and/or citizens Health care providers recognise citizens health care electronic documents	Not during the first phase however once a one shop approach is initiated data for work permit and residence permit will be submitted by this means	Electronic certificates of origin of goods Electronic licenses for the activity (export or whatever); Other electronic documents relates to the declaration/SAD Custom administration recognises the AAD electronic document
Electronic document transfer	Transfer of documents between citizens and administrations Transfer of documents between administrations	Transfer of documents between companies and administrations Transfer of documents between administrations Transfer of documents between citizens and health care providers		Electronic certificates of origin of goods Electronic licenses for the activity (export or whatever); Other electronic documents relates to the declaration/SAD

Mandate situation		Company could mandate an HR services company to manage the E101 forms	Company could mandate an HR services company to manage the forms	The transporter makes declaration on behalf of the shipper
Signature	Administrations sign the electronic documents they deliver	Citizens and company could sign the E101 form Administrations sign the electronic documents they produce		goods transporter signs the custom declaration Bank signs its guarantee documents Shipper signs documents to authorise the transporter to transport the goods
Local/regional/national level involved	National + Local	National	National + (Regional)	National
Actors	C/A	A/B/C	A/B/C	A/B
Cross context/ sector interactions	social security internal affairs population Administration from different countries	national electronic card health care social security	Contractual / employment data Company register Social security data	Tax administration Customs administration Bank Citizen playing the role of a transporter

2. SURVEY OF POSSIBLE eID APPLICATIONS

2.1 Introduction

A number of example applications were presented briefly in the previous sections. It is important to note that the field of possible applications from which the pilot applications could be selected is very broad, as the introduction of eID can have significant impact on nearly every type of interaction between groups of citizens, businesses and the administrations that serve them.

In the following sections are outlined a selected sampling of typical applications where the introduction of eID could have a significant impact, as identified in the PEGS report by Capgemini for the IDABC program. The variety and scope of possible applications that should be considered by the participants for selection for the pilot is illustrated by the diversity of the list. The list is not intended to be exhaustive, but rather to stimulate reflection on the possibilities in the search for the best pilot applications.

2.2 Company creation

Starting up a new company in a new country of residence (or a subsidiary for an SME) implies submitting multiple documents with local administrations. All these documents, attestations, declarations, permits etc. must be collected personally, on paper, either locally (e.g. permits, certificates of domicile) or in the member State of Origin (e.g. birth certificates, declarations showing no criminal conducts). Some documents may be illegible due to the difference in language. An eID system would have allowed these documents to be collected immediately, signed and filed electronically. Some documents could have been collected directly at the source, at the citizen's request but without further intervention, which would have reduced costs, improved efficiency and eliminated possible errors.

2.3 Public procurement

Tenders generally require certificates to be collected (company registers, payment of social security and taxes, audited balance sheets…) and statements to be drafted (truthfulness of the offer…). Those are gathered on paper at different sources, signed, stamped and joined to the final bid in triplicate. Conversely, the resulting bid could have been filed electronically, signed electronically (e.g. through a signed e-mail), and could have included trusted certificates directly delivered by the administration and understandable in the local language.

2.4 Identification in taxation systems (business)

Paying or refunding VAT abroad is complex, time and cost consuming. Enabling a company to fulfil its VAT obligations (including request for refund) for its EU-wide activities solely in the Member State the company is established in would be welcomed. An eID system would allow a trader to use a single VAT number for all supplies/deliveries made throughout the EU and to make VAT declarations to one single electronic portal that would then submit the declaration automatically to the different Member States.

Similarly, the declaration, traffic and movement control of excise goods could be organised on European level if an effective identification is present.

2.5 Electronic declaration of foreign workers

A new law will impose to all Member States to setup a system where companies and/or individuals can declare the employment of a person in another country than the one he resides in. The idea is that companies as well as people first enrol and then do a declaration of their professional services abroad. The goal behind this is to make sure that all benefits linked to the

employee's status continue to be available. The corresponding tools require a strong identification of EU citizens who present themselves on corresponding website.

2.6 Moving to a different EU Member State

Moving to a different EU Member State implies obtaining a residence or working permit (depending on the country of origin). This means the registration of an official address with local administrations and requires a certificate attesting the previous domicile, usually delivered at the former place of residence and often in another language. An appropriate eID system would have allowed this process to be conducted electronically, using electronic authentic source in the country of origin (national registers). This would improve efficiency (e.g. eliminate the need of an official translation) and accuracy, make fraud less likely and reduce costs.

2.7 Request of certified documents (such as marriage or birth certificates)

Changing your marital status requires certified documents such as a birth certificate and therefore either contact with the local embassy or travels to the home country (which also means countless hours lost in travel and processing by local administration). The delivery of birth or marriage certificate is a service which can be completed at a distance with a minimal expenditure of time and effort if a proper level of security is applied. This could become a virtually fully automated procedure between administrations, which would be more cost-effective, user friendly and less prone to error.

2.8 Renewal of a driver license

Since categories and subcategories of driver licenses are harmonised, it is possible to exchange foreign European licenses in a national driving license. Mobile European citizens holding a driving license (200 million citizens) could renew or replace their license where they live without travel to their home country. An online renewal or replacement of driving licenses can be processed if the security of this service can be guaranteed. Since this requires the verification of the driving license, an exchange of information between national driving licenses registers will be necessary. A notification of expiration in the near future could also be send to all holders of a driving licence in order to trigger an online renewal.

2.9 Electronic identification in taxation systems (citizens)

All residents and even non-residents, who need to declare income taxes in a country, would like to be able to declare their taxes online. Temporarily working abroad and worker mobility makes the electronic tax return process especially attractive as the tax process always has a time shift to the respective working period and therefore in the case of location change implies a natural demand of remoteness. The exchange of certain data (i.e. total income, pre-paid taxes) between tax administrations would ease the declaration for citizens and would combat tax evasion. This requires however a suitable identification of the worker such as offered by eID.

2.10 Pension

Retirement formalities imply queries of working periods in various member states. Ideally, a 'mobile' citizen will apply for a pension at the retirement age in his living country and the local administration will exchange information with authorities in the countries where the applicant previously contributed to the pension system, to determine the amount of money that should be paid out each month. This requires a unique identification of the citizen. This process will be less time-consuming for the citizen, makes fraud less likely and allow the administration to have more control on the process.

2.11 Securing electronic communication of minors

There is substantial concern with the electronic media when these are used by minors. Minors should be given protection and privacy; still, over the internet without precautions, risks are taken if people not belonging to this group masquerade and take part in interactions with legitimate minors. To ensure that criminal elements are not entering this very private sphere and reassure parents, eID could be used by dedicated chat rooms for youngsters where login is only possible with eID. The eID would provide a trusted date of birth limiting access above a predefined limit.

2.12 Unemployment benefits

To facilitate the unemployment benefits application process for people that have paid social contributions in another country, exchange of information between the tax administrations (employment and income figures) and the unemployment agencies (unemployment figures and allowances) should be established between different countries. Countries should exchange information stored in their databases (like social security contributions paid in a certain country, the employment track of a person) through an interoperable network. This would improve efficiency, makes fraud less likely and allow administrations to have more control on the process.

2.13 Exchange of social security information

European inhabitants moving from one European country to another are part of their living country's public health insurance system. E-forms of 'mobile citizens', such as in the area of emergency health benefits (E111/European Health Card), or migrant workers (E101), currently regulate the cross-border flow of information related to social security. This manual exchange of information could be eliminated if the information included in the forms is automatically shared between the responsible administrations using eID. Such initiatives simplify the procedure when receiving medical assistance during their stay in a participating country and are also a powerful mean to combat fraud.

3. DETAILED PRESENTATION OF BUSINESS CASES

3.1 Introduction

It is instructive to consider in more detail how some specific situations or "business cases" would be positively impacted by the use of eID and the possibilities it affords via its introduction.

In the following sections are presented two scenarios which have been identified (on the basis of the criteria as laid out in section 1.3.1, "Selection Criteria", page 5) for illustrative purposes. They could be considered as potential "killer applications" for eID, i.e., applications which illustrate convincingly and clearly to a broad audience the overwhelming benefits and advantages of the use of eID.

The first scenario concerns a citizen who obtains an "ePrescription" from a doctor he does not know and does not know him. The second scenario concerns an online transaction between two distant parties over a high-value item.

For each case, a description of the following is provided:

- the current issues,
- how the eID would be used,
- the added value provided by the introduction of eID, and
- a brief evaluation of the application in question vis-à-vis the selection criteria.

3.2 The "paperless prescription" case

3.2.1 Current issues

Currently, a doctor makes a prescription by manually writing down the respective names and quantities of the medicines he is authorizing his patient to purchase. For security reasons, the doctor must write the prescription on a special prescription form (delivered by the administration), and it is only valid once he has officially "stamped" it. This process can pose some specific problems:

- It is sometimes very difficult for the Pharmacist attempting to fill the prescription to understand the handwriting of the prescribing doctor. He may ultimately need to contact the doctor directly to validate the content of the prescription in question.
- Using commonly available means, it is relatively easy for a fraudster to create a fake prescription by making passable facsimiles of the prescription form and the doctor's stamp.
- If a patient looses the paper prescription form:
    - Anyone finding might be able to use it
    - If the patient requests another one, the prescribing doctor has no way to verify in advance if the prescription has really been lost or if the patient simply wants to fraudulently obtain additional quantities of the prescribed drugs
- Doctors have no way to verify if a patients they have seen are visiting other doctors in order to receive multiple prescriptions for the same drugs

- Prescriptions are at present only valid in the country in which they have been issued

3.2.2 Using eID

An ePrescription would consist of an electronic authorization for the patients to purchase a number of medicines in some specified quantities. This electronic authorization would be delivered by the doctor and stored in an electronic "lock box".

Patients will have the ability to grant access, individually, to pharmacies and to doctors, to selected items located in their "lock box", including ePrescription(s).

The processes of authentication and authorization of the patient, the doctor and the pharmacy will be based on eID.

Patients would also have the possibility to delegate the usage of some functions of their "lock box" to third parties (such as hospitals, family members, etc.), who they specifically authorize to perform specific actions such as purchase a specific prescription.

ePrescrition systems will be implemented in a cross-border way across the EU, so that an ePrescription created in one MS will be no different in principle or in practice than one created in any other MS.

3.2.3 Added value

The implementation of ePrescription system will provide significant added value to each of the parties involved in a typical transaction (patients, doctors, pharmacies and mandated people) while guarantying their respective privacy (but principally the patient's privacy is the focus of concern).

The greatest advantages of ePrscription's, are that their use will greatly reduce the level of errors, such as:

- Miscommunication between doctor and pharmacy due to the use of handwritten prescriptions
- Incompatibility of drugs prescribed by two different doctors to the same patient

In addition to the error-reducing benefit, the use of ePrescription's will provide the following advantages to the different parties:

- Patients will have the possibility to
    - purchase their prescription-only medicines online
    - allow third parties to purchase their medicine for them
    - purchase their medicines while abroad
- Doctors will have the possibility to easily verify the prescription history of their patients
- Pharmacies will have a much easier selling process
    - No more difficulties in understanding the handwritten prescriptions
    - Automatic encoding (and translations) of the ePrescriptions

- Doctors and administrations will be able to more easily detect some types of fraud linked to the usage of prescriptions, such as doctor-shopping

3.2.4 Evaluation of Selection as candidate

This case study falls in the domain of of "e-Health" and concerns transactions that take place between citizens (patients and mandated people), business (doctor and pharmacy) and administration (social security).

The following three constraints must be respected by any pilot;

- Reuse existing infrastructure and systems
- Provide interoperability between member states
- Respect the principle of subsidiarity with respect to technology and implementation choices

The proposed pilot should therefore 1) reuse any existing ePrescription systems already in place in the MS's, 2) function using interoperability between the ePrescription systems already implemented in the MS and 3) be based on a federated architecture

In order to compare the different cases, the following criteria have been defined for the scenario scoring:

1. **High impact** in terms of the number of persons in the society potentially affected by the changes in a positive way, and the frequency of occurrence of the scenario; according to statistics citizens in several large EU MS make an average of around 7 visits to doctor per citizen per year (http://www.nationmaster.com/graph/hea_con_wit_doc-health-consultation-with-doctors)

2. **Cross-Border coverage**, the proposed system has no-border, it makes no difference if the doctor and/or pharmacy are in the next town or the next country/EU MS.

3. **Will be seen as a public benefit**, advancing Public Health goals via enhanced "eHealth" capabilities

4. **Visible, clear and concrete benefits** to citizens (patients), businesses (Health care providers, pharmacies) and administrations are, in terms of: simplification and facilitation of frequently executed activities, and enhanced anti-fraud (reduced doctor shopping for drugs)

5. **Functional coverage** is broad, involving interesting aspects of identity, authentication, authorization/mandates, standardized data sets, centralized data safes ("lock box"), privacy and data protection, etc.

6. **Cross-sector coverage**, concerning a process that involves administrations, citizens, and businesses

7. **Technology coverage** is interesting (PKI, DS, etc.) but neutral as to implementation (smart card, token, SMS, "lock box" data safe, etc.

8. Quick to implement pilot can be a **quick win** (not too complex to implement, and in a manner which isolates the technology and data sets in question from other technologies and data sets concerning other activities in other sectors of activity), and lead to a series

of other quick wins, by extension of the current scenario (payment for consultation with physician, reimbursement from social security administration for visits and drug purchases, etc.)

9. **An opportunity to collect significant feedback**, especially as regards privacy (the provision of private health care – i.e., w/o social security support from the state, and the possibilities for anonymous health care under the system, which is still possible today)

3.3 On-line trading of large-value items

3.3.1 Current Issues

A citizen wishes to purchase an item on-line via an on-line marketplace (such as eBay); in the case where the item's location is at some distance away from the buyer, or even in another country, it is inconvenient or impossible for the buyer to make an in-person inspection. The buyer doesn't know the seller, and they may not even speak the same language. If the item in question has market value of sufficient size (a threshold lies somewhere between € 2.000 and € 15.000 for the typical person), the potential buyer may be uncomfortable with the notion of concluding an on-line, at-a-distance purchase from an unknown seller, and therefore unwilling to proceed.

3.3.2 Using eID

Buyers and Sellers use their eID's to identify themselves and to affirm having taken various actions. Trusted third parties such as Transaction service providers, Payment service providers and Inspectors, use their eID's throughout to present their credentials as trusted third parties. In the case of disputes, the various eID's form the basis for the various documents used in the legal proceedings that may occur.

3.3.3 Added value

With the introduction of eID's, buyers can benefit from the significant reduction of risk provided by their use in the context of the electronic trading and payment systems used to conclude the transaction. In particular, the buyer can have as near as possible certainty as to the identity of the seller, and can receive legally binding and non-forgeable notification of reception of the payment, non-forgeable confirmation of shipment of the goods/item in question (where appropriate), as well as legally binding sales agreement laying out the conditions of the sale (also where appropriate).

The only uncertainty in the transaction that is not directly eliminated or reduced by the use of the eID's concerns the condition of the item, i.e., the question of whether the condition of the item is as advertised at the time of sale. However, the use of eID's could provide a significant measure of legal protection to the buyer in the form of simplified and streamlined legal recourse in the case of a bad transaction, thereby indirectly reducing risk.

Furthermore, additional confidence building steps are possible and would be facilitated by the use of eID's, including:

- Both buyer and seller availing themselves of the services of trusted third parties, such as: verification that the description of the state of the goods provided by the seller to the buyer at time of purchase matches the state at the time of shipment; such third parties would be able to obtain and present (using their eID's) non-forgeable credentials as to their trustworthiness in this role

- The buyer can avail himself of insurance on the item during shipment/delivery to cover damages, loss or theft, facilitated and made more economical via the use of all the electronic documentation mentioned above.

For transactions in which transfer of ownership is itself a formalized process, services such as escrow in a cross-border context can be facilitated (simplification and acceleration of the process, elimination of language barriers, harmonization of the legal provisions that apply, etc.) by the use of eID's.

Legitimate sellers will benefit from having access to significantly larger numbers of buyers (selling faster, higher chance of selling their goods at the desired price, etc.) attracted by the reduced risks of participation. Furthermore, non-forgeable proof of shipping afforded by use of eID's protects the seller from false claims against him.

In addition, for some transactions specific steps could be mandated for formal closure such as requiring the buyer to either notify the seller of reception which cannot be forged, and which he cannot repudiate (again protecting the seller), or file a claim of non-reception within a certain period. In both cases, using his eID the buyer would be making legally binding statements.

3.3.4 Evaluation of Selection as candidate

This case study falls in the domain of eCommerce, and concerns transactions that take place between citizens, but does involve to various degrees under certain conditions other third parties such as businesses and administrations. It fulfills a number of the criteria that have been defined for scoring of the scenario, in particular (in order of priority):

1. **High impact** in terms of the number of persons in the society potentially affected by the changes in a positive way, and the frequency of occurrence of the scenario; on-line trading sites such as eBay and iOffer have tens (perhaps even hundreds) of millions of registered users, and the number of transactions engaged in on regular/daily basis is enormous; statistics on e-commerce show that large percentages of such consumers lack trust, and find on-line transactions risky (provide details)

2. **Cross-Border coverage**, in fact the scenario described is another no-border scenario: the locations of buyer and seller are made irrelevant (within the EU).

3. **Will be seen as a public benefit**, confronting fraudsters and providing legal protections to consumers (on-line buyers); according to statistics the amount of on-line fraud is staggering (in the tens of Billions of euros annually); introduction of eID's have the potential to dramatically improve the situation

4. **Visible, clear and concrete benefits** to citizens (buyers and sellers), businesses (online marketplace providers, 3rd party payment providers, other trusted 3rd parties) and administrations (simplified adjudication of disputes, traceability of transactions, etc.); particularly in terms of reduced risk of bad/fraudulent transactions (bad sellers)

5. **Functional coverage** is broad, involving interesting aspects of identity, authentication, digital signatures/certifications of specific actions and conditions, authorization/mandates, standardized data sets, etc.

6. **Cross-sector coverage**, concerning a process that involves administrations (adjudication of disputed transactions), citizens (buyers/sellers), and businesses (possibly sellers, trusted third parties, including: trading and payment service providers, escrow, "goods condition inspector", etc.)

7. **Technology coverage** is interesting (PKI, DS, etc.) but neutral as to implementation (smart card, token, SMS, “lock box” data safe, etc.

8. Possibly a **quick win** as the scenario assumes legislative support giving considerable weight to the certifications described in the scenario, especially for adjudication of disputes; the relevant legislative environment may be different or even problematic in some member states, however.

9. Some further reflection may be needed on the gathering of **feedback**, as transactions involving such large values, might be accompanied by some reluctance on the part of participants to share information about the transactions they have participated in. For example, some inducements to participation could be envisaged.