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*The PwC eHealth  
Service Platform Study*  
Lessons learned from other  
countries  
January 2012

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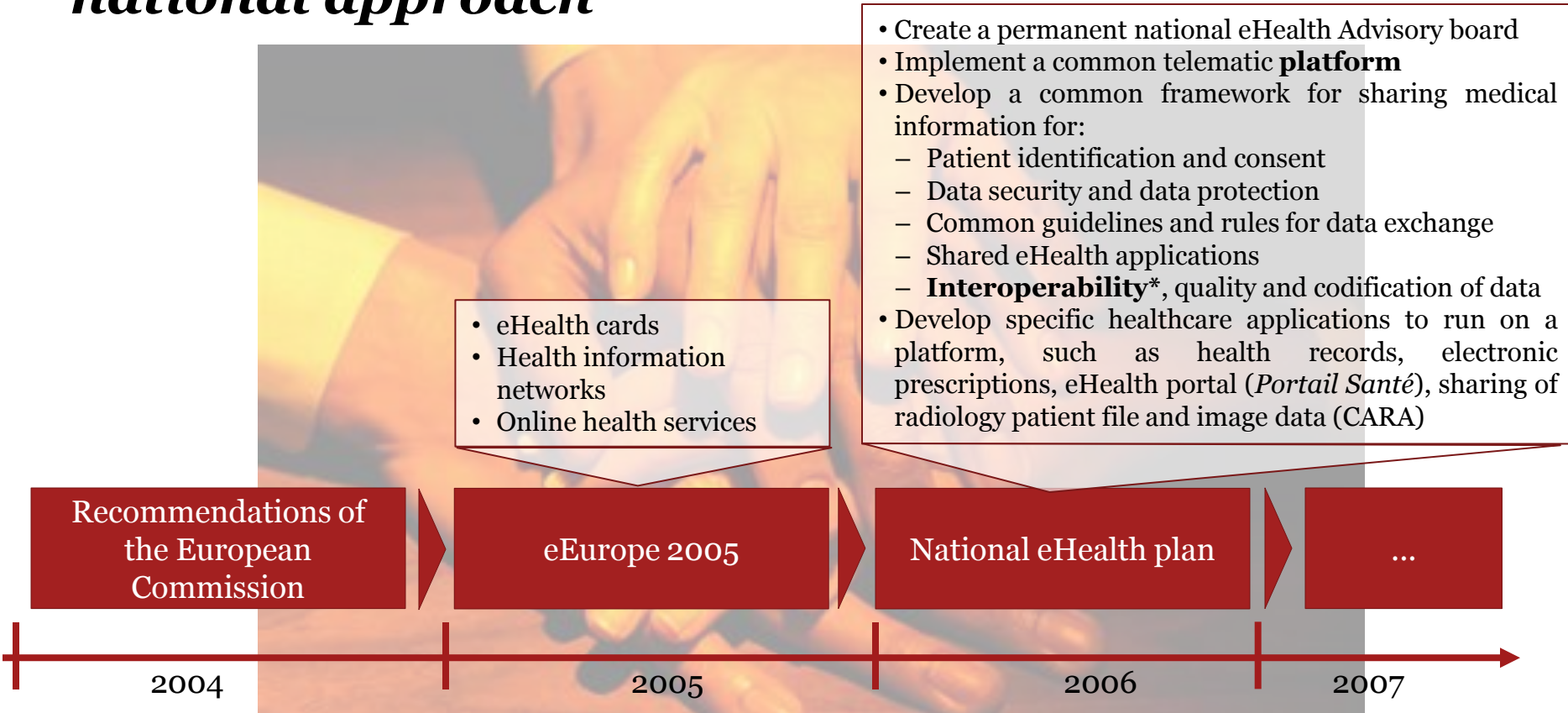
# *Agenda*

1. Context and objectives
2. Scope of today's presentation
3. Approach and methodology
4. Results
5. Closing

# *Context and objectives*

# *1*

# ***Towards collaboration: From a European to a national approach***



\*Interoperability = ability of a system to work with or use the parts or equipment of another system, here: a secured infrastructure to facilitate the exchange and sharing of information between healthcare providers, patients and health administrations, by enclosing and providing a set of dedicated applications and functionalities (the “services”)

**A common framework to share medical information needs to be implemented as interoperability platform, but what information is exactly needed?**

# ***What information is needed to define an interoperability platform for Luxembourg?***

*The eSanté-EFES study gave hints what to look for and triggered the eHealth Service Platform Study*

eSanté programme	eSanté-EFES
	eSanté-CARA
	eSanté-LABO

Study objectives



## **Project objectives:**

1. Determine **good practices** in eHealth services implementation
2. Analyse **other eHealth initiatives** with regard to the Luxembourg context
3. Estimate **costs and benefits** related to implementing and operating an interoperability platform in Luxembourg

The results of the study aimed to provide relevant information to enable informed decisions for stakeholders regarding the interoperability platform

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# *Scope of today's presentation*

# 2

## 2. Scope of today's presentation

# *What is in scope of today's presentation?*

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- Context and Objectives
- Comparative analysis on selected eHealth Initiatives

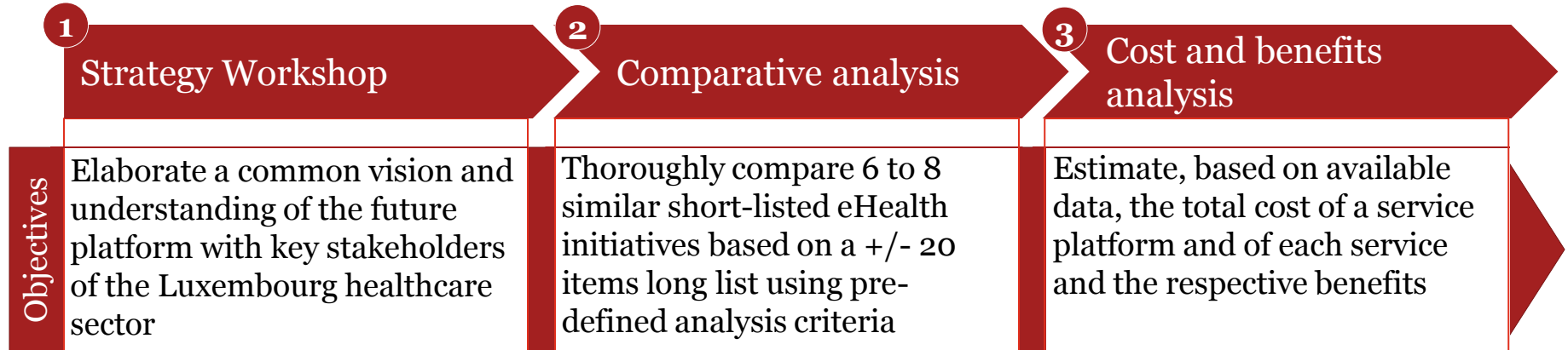
- Benefits of the Platform
- Conclusion and Recommendations
- Approach and Methodology

# *Approach and methodology*

3

### 3. Approach and methodology

## *We used a 3-phase approach*



#	Phase	May 2010				June 2010				July 2010			
1	Strategy Workshop												
2	Comparative analysis												
3	Cost and benefits analysis												

In eight weeks, we delivered a 233-page report going through Europe's and North America's most important initiatives

# *Results*

# 4

# In the Strategy Workshop, we asked the participants to rank the future eHealth services by order of priority for Luxembourg

eSanté

Participants were asked to rank by order of priority the following list of services. Points are allocated as follows: 1<sup>st</sup> position: 1 point, 2<sup>nd</sup> position: 2 points, 3<sup>rd</sup> position: 3 points, from 4<sup>th</sup> to 10<sup>th</sup> position: 4 points. Services unranked by the respondents get 5 points. Consequently, services with smaller score are of utmost importance. |

Type de service	Service proposé	P1	P2	P3	P4	P5	P6	P7	P8	MOYEN
Services résultats	Echange de données entre plateau technique et prescripteur (image, biologie, anatomopathologie)	5	5	5	1	1	1	1	1	15
Aide à la décision	Aide à la décision pour la prescription des actes de biologie	3	1	4	3	3	1	3	1	15
Prescription électronique	Echange de la prescription médicamenteuse au travers d'un serveur de prescription	5	1	3	3	3	1	1	1	15
Statistiques	Requêtes de santé publique et recherche : Datawarehouse	5	5	5	1	1	1	1	1	25
Prescription électronique	Echange de la prescription émise avec un plateau technique (image, biologie, ...)	5	2	2	3	3	2	2	2	20
Services administratifs	Connexion d'un serveur de prescription	4	1	3	1	1	1	1	1	20
Aide à la décision	Aide à la décision pour la prescription médicamenteuse	5	3	4	1	1	3	1	1	21
Santés Caracog	Gestion des catalogues des actes médicaux ou autres	4	5	4	1	3	1	1	3	21
Usages agréés électroniques professionnels sécurisés	Usages agréés électroniques professionnels sécurisés	5	5	5	2	2	1	1	2	22
Dossier Patient Partagé	Partage des informations de prescription médicamenteuse dans un dossier patient partagé	5	1	5	1	2	3	2	1	23
Dossier Patient Partagé	Partage du compte rendu d'imagerie médicale / images illustratives dans un dossier patient partagé	5	3	3	3	2	3	3	1	23
Dossier Patient Partagé	Partage de la documentation des filières de soins dans un dossier patient partagé	5	3	1	1	5	3	1	2	23
Reconnaissance professionnelle en ligne / elearning	Permettre l'accès à la formation en ligne / elearning	5	5	5	3	1	1	1	3	24
Dossier Patient Partagé	Partage du compte rendu de biologie dans un dossier patient partagé	5	3	3	3	2	3	3	1	25
Aide à la décision	Aide à la décision pour la prise en charge médicale et soignante (accès aux données)	5	5	4	1	3	1	2	3	25
Prescription électronique	Echange de la prescription autres : actes thérapeutiques, actes techniques, médicaments, ... au travers d'un serveur de prescription	1	3	5	5	3	3	3	2	25
Services administratifs	Demandes de prises en charge (AM, AD, AA)	5	1	5	5	2	3	2	2	25
Dossier Patient Partagé	Partage de données administratives du patient	1	3	5	5	5	1	5	1	26
Services administratifs	Transfert et validation des données de facturation (AM, AD, AA, ...)	5	2	5	2	3	3	3	2	26
Dossier Patient Partagé	Partage des informations relatives aux maladies et symptômes	1	4	4	5	5	3	5	1	27
Aide à la décision	Aide à la décision pour la prescription des actes d'imagerie médicale	1	4	5	5	5	3	5	1	27
Teleconsultation	Teleconsultation	5	5	5	5	1	2	1	5	29
Teleassistance	Notification push à patients (patients et PS)	5	5	5	2	3	1	5	3	29
Dossier Patient Partagé	Partage des images synthétiques dans un dossier patient partagé	5	1	5	5	5	5	5	2	30
Dossier Patient Partagé	Partage des informations relatives aux maladies chroniques (et disease management)	5	4	5	5	5	5	5	2	30
Santés génériques de la plateforme	Arbitrage centralisé	5	5	5	5	1	5	5	1	31
Santés génériques de la plateforme	Gestion des installations	5	5	5	5	1	5	5	1	31
Santés génériques de la plateforme	Gestion des modes d'accès	5	5	5	5	1	5	5	1	31
Santés génériques de la plateforme	Gestion du consentement	5	5	5	5	1	5	5	1	31
Santés génériques de la plateforme	Single Sign-On	5	5	5	5	1	5	5	1	31
Teleassistance	Reunion de concertation pluridisciplinaire	5	5	5	1	5	5	5	1	31
Dossier Patient Partagé	Partage des informations relatives aux épisodes de soins	5	4	4	5	5	5	5	2	31
Teleassistance	Teleconsultation patient / professionnel	5	5	5	5	5	5	5	2	31
Services administratifs	Transfert des données de déclaration d'activité de travail	5	5	5	5	1	5	5	3	33
Dossier Patient Partagé	Partage des informations de prescription personnelle du patient dans un dossier patient partagé	5	4	5	5	5	5	5	1	35
Dossier Patient Partagé	Partage des informations relatives aux vaccinations	5	4	5	5	5	5	5	1	35
Santés génériques de la plateforme	Gestion des annuaires / (D)épannage (ressources professionnelles)	5	5	5	5	1	5	5	3	36
Santés génériques de la plateforme	InterPatient mobile / Dépendance (Tuteur / Pro Fam)	5	5	5	5	1	5	5	3	36

Electronic Health Record

Electronic prescription

Decision support

Statistics

Affiliation control services

Result server



LE GOUVERNEMENT  
DU GRAND-DUCHÉ DE LUXEMBOURG  
Ministère de la Santé

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## 6 strategic eHealth services were identified in the Strategy Workshop

## *Based on desk research, we identified 20 projects for an initial analysis and recommendations*

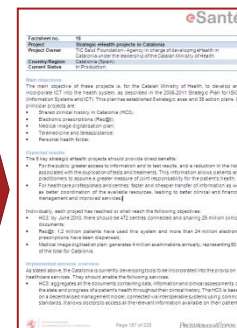
Project	Region, Country
Région sans film	Ile de France, France
Dossier médical du patient	France
Diraya	Andalucía, Spain
Plate-forme régionale Franc-Comtoise	Franche-Comté, France
Plate-forme régionale Rhône-Alpes	Rhône-Alpes, France
US National Health IT Initiative and Meaningful Use programme	USA
Sjunet - Sweden national healthcare broadband network	Sweden
Dossier de Santé du Québec (DSQ)	Québec, Canada
Elektronische Gesundheitsakte (ELGA)	Austria
Elektronische Patientenakten (EPA 2015)	Nordrhein-Westfalen, Germany
Kaiser Permanente Health Connect	USA
Dossier Pharmaceutique	France
Health and Social Care Information System (CRS-SISS)	Lombardia, Italy
NHS Connecting for Health	UK
Be-Health - eHealth platform in Belgium	Belgium
Digital Health Record	Estonia
National Electronic Health Record (EPD/EMD/WDH)	The Netherlands
Strategic eHealth projects in Catalonia	Catalonia, Spain
Plate-forme régionale de Picardie	Picardie, France
Slovenian eHealth experience	Slovenia

# What did we exactly compare?

Long list

- Master data: Project name, owner, country/region, current status
- Project data: Main objectives, expected results, implemented services, budget, project financing, options and limits of further analysis, information sources
- Conclusions and recommendations

20 factsheets



deliverable

Short list

- 7 short-listed projects based on recommendations
- Factsheet information: Is part of healthcare plan in the region/country?, details on sub-projects, project on track? Which parties involved and how managed? Common platform? Platform features? Compared to Luxembourg eHealth service priorities, financial information, governance / technical operation / information security rules, ...
- Comparison of stakeholder management, key success factors, project risks, governance structure, information security, key platform-related information, development vs. acquisition of interoperability framework, standards

deliverable

7 detailed factsheets + comparison chart



Validation

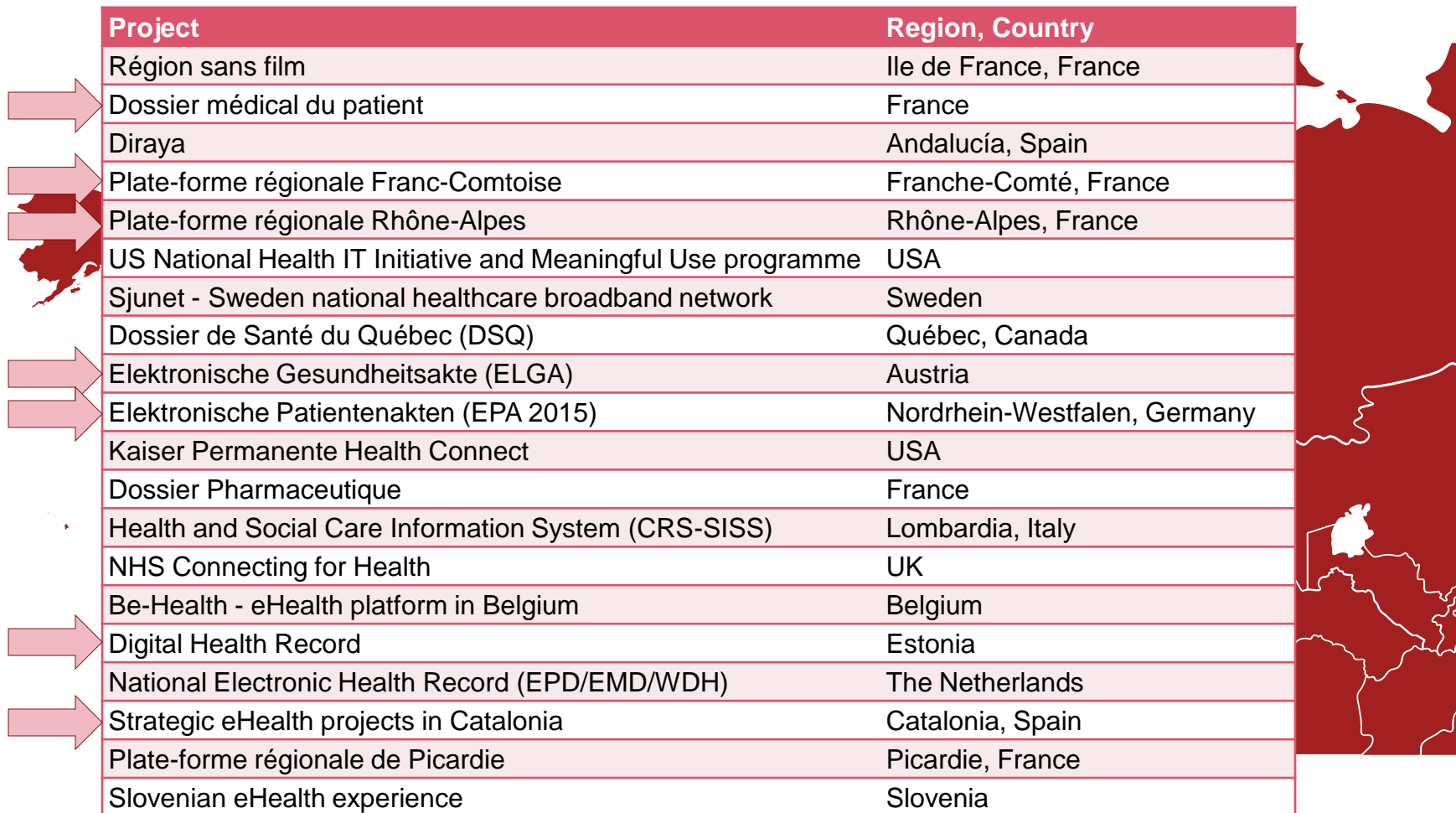
- Definition of socio-economic indicators and demographic criteria for comparison of healthcare environments
- Validation of the shortlist results by computation and comparison of the indicators in the analysed countries / regions

deliverable

Comparison chart



## *Based on recommendations of initial research, we put 7 projects on a short-list for detailed analysis*



Project	Region, Country
Région sans film	Ile de France, France
Dossier médical du patient	France
Diraya	Andalucía, Spain
Plate-forme régionale Franc-Comtoise	Franche-Comté, France
Plate-forme régionale Rhône-Alpes	Rhône-Alpes, France
US National Health IT Initiative and Meaningful Use programme	USA
Sjunet - Sweden national healthcare broadband network	Sweden
Dossier de Santé du Québec (DSQ)	Québec, Canada
Elektronische Gesundheitsakte (ELGA)	Austria
Elektronische Patientenakten (EPA 2015)	Nordrhein-Westfalen, Germany
Kaiser Permanente Health Connect	USA
Dossier Pharmaceutique	France
Health and Social Care Information System (CRS-SISS)	Lombardia, Italy
NHS Connecting for Health	UK
Be-Health - eHealth platform in Belgium	Belgium
Digital Health Record	Estonia
National Electronic Health Record (EPD/EMD/WDH)	The Netherlands
Strategic eHealth projects in Catalonia	Catalonia, Spain
Plate-forme régionale de Picardie	Picardie, France
Slovenian eHealth experience	Slovenia

### Legend:



Long-list project



Short-list project

# Implementation status of short-listed eHealth initiatives in summer 2010

Updates

Top 6 services required by Luxembourg	Electronic Prescription	Decision support	Statistics	Affiliation control services	Result server	Shared and Distributed Patient Record
Project						
Dossier Médical Personnel	No	No	Under Dvt	Under Dvt	Under Dvt	Under Dv
Plate-forme régionale Franc-Comtoise / Franche Comté regional eHealth platform	Yes	Yes	Yes	Yes	Yes	Yes
Plate-forme régionale Rhône Alpes / SIS-RA platform and its services (DPPR, PEPS, Trajectoire, ...)	No	No	No	No	Yes	Yes
Elektronische Gesundheitsakte - ELGA (Electronic Health Record Initiative)	No	No	No	No	Under Dvt	Under Dvt
Elektronische Patientenakten - EPA 2015 (NRW)	No	No	No	No	No	No
Digital Health Record in Estonia	Yes	Under Dvt	Under Dvt	Yes	Under Dv	Yes
Strategic eHealth projects in Catalonia	Yes	Yes	Yes	Yes	Yes	Yes

- Telemedicine: *Loi HPST* and *décret d'application* (definitions, implementation rules, organisation), guidelines to setup telemedicine programmes
- Regional PACS, “Digital hospital plan” (Hôpital numérique)
- DMP in progress but less than expected (56 000 files opened, 96 000 documents published – medical images, lab results, ...)
- strong ASIP leadership: published reference models, interoperability framework, convergence of regional solutions to national objectives

- Law on ELGA in draft status, should be passed in S1-2012
- Centralised patient index tested
- Healthcare provider index currently being tested
- CDA implementation guidelines for medical imaging, lab results and discharge letters
- Operations concept in progress
- epSOS pilot (patient summary) started

# What did we exactly compare?

Long list

- Master data: Project name, owner, country/region, current status
- Project data: Main objectives, expected results, implemented services, budget, project financing, options and limits of further analysis, information sources
- Conclusions and recommendations

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Short list

- Factsheet information: Is part of healthcare plan in the region/country?, details on sub-projects, project on track? Which parties involved and how managed? Common platform? Platform features? Compared to Luxembourg eHealth service priorities, financial information, governance / technical operation / information security rules, ...

deliverable

7 detailed factsheets + comparison chart



Validation

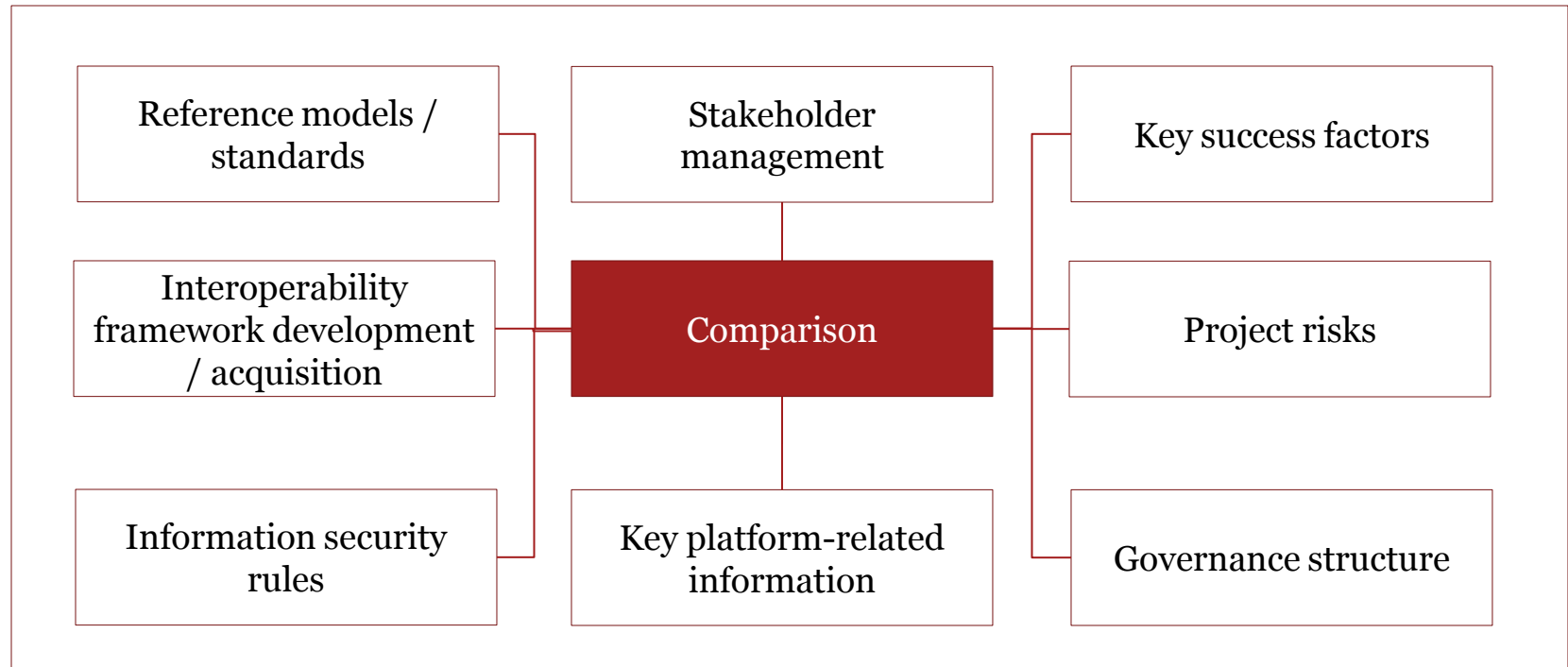
- Definition of socio-economic indicators and demographic criteria for comparison of healthcare environments
- Validation of the shortlist results by computation and comparison of the indicators in the analysed countries / regions

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Comparison chart

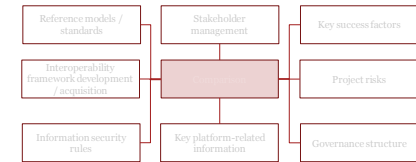


# *We compared the short-listed projects regarding eight subjects*



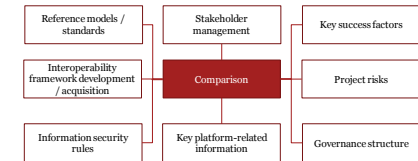
The items compared enabled the identification of good practice and lessons learned

## *Lessons learned in other projects (1)*



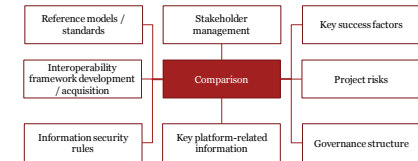
Item	Lesson learned	Coverage
Governance structure	should be one of the first steps when implementing eHealth services	5 out of 7
	Project teams to be established for each sub-project, reporting to the Agency board	6 out of 7
	Ensure alignment between initiatives and overall organisational governance	7 out of 7
Stakeholder management	Stakeholders need to be involved early on, continuous stakeholder involvement is a critical success factor,	5 out of 7
	Key stakeholders should provide beta-testers for pilot ICT solutions enabling the eHealth services	1 out of 7
Information security	Data secured inside application, with authentication processes (electronic certificates / healthcare professional cards, or username-password combination for patients), patients grant and revoke access to their data	2 out of 7
	A Technical office assures ICT security, security risk management implemented	1 out of 7

## Lessons learned in other projects (2)



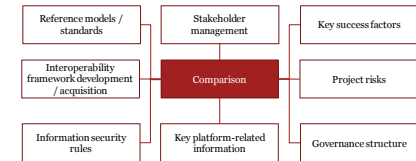
Item	Lesson learned	Coverage
Project risks	Lack of platform and eHealth service adoption may be due to insufficient stakeholder involvement	3 out of 7
	Insufficient incentive policy may slow down adoption process	3 out of 7
	Security issues (confidentiality, data protection issues) may turn users away	2 out of 7
	Too complex projects may fail, planning horizon should hence be less than 5 years	2 out of 7
	Risk analysis should always be performed	2 out of 7
Interoperability frameworks	Regional platforms and interoperability implemented before national platforms, national interoperability in progress	7 out of 7
	Mandatory vs. recommended interoperability frameworks	Mandatory: 2 out of 7 Recommended: 3 out of 7

## *Lessons learned in other projects (3)*



Item	Lesson learned	Coverage
Key platform-related information	French projects operated by an external provider	3 out of 7
	Common technical platform for all eGovernment services, connects all public sector databases	1 out of 7
Standards (extract)	HL7 CDA R2	3 out of 7 (and many more)
	LOINC® as a common reference for clinical biology results	3 out of 7 (and many more)
	IHE XDS, ATNA, ...	4 out of 7 (and many more)
	DICOM	3 out of 7 (and many more)

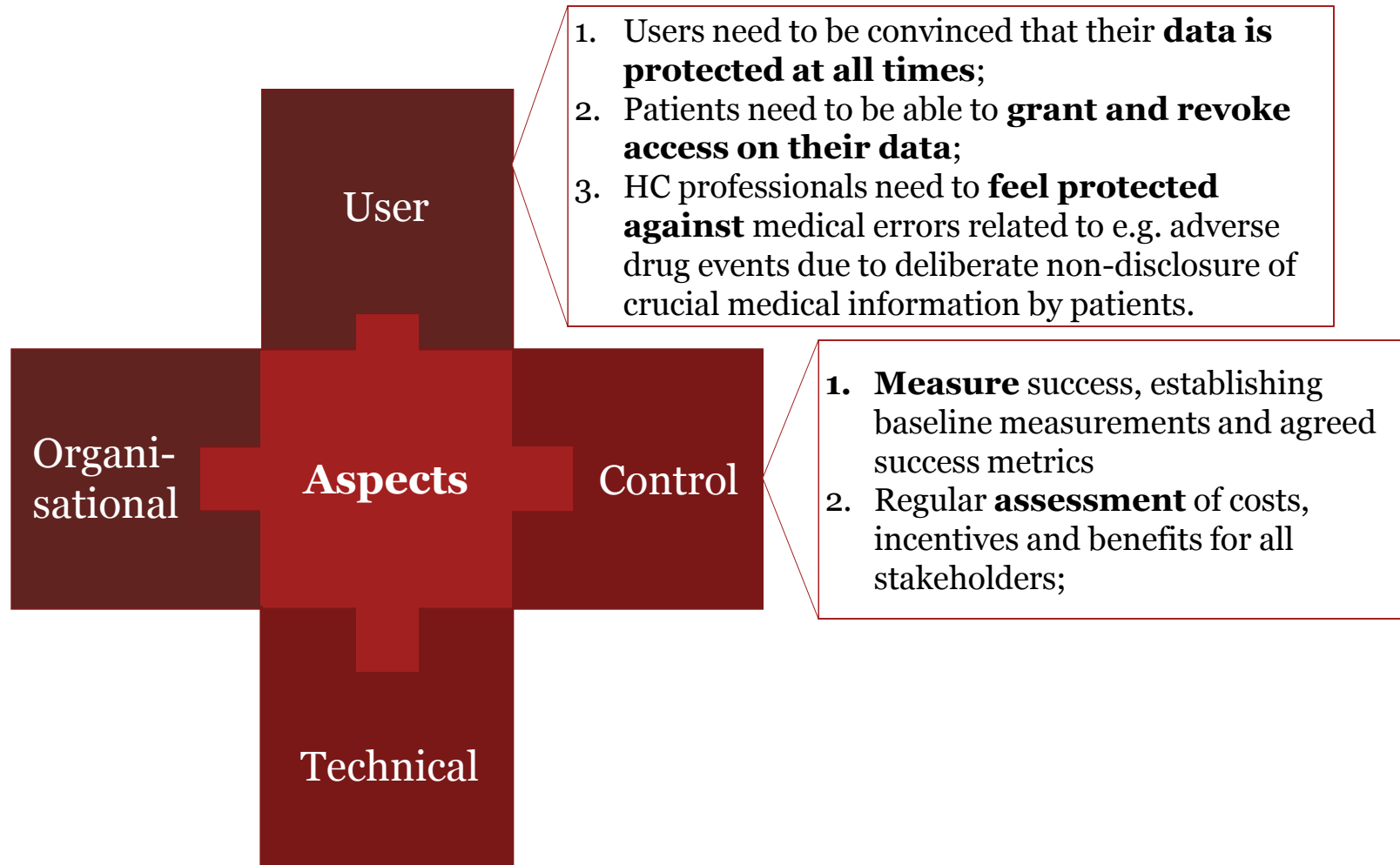
## Lessons learned in other projects (4)



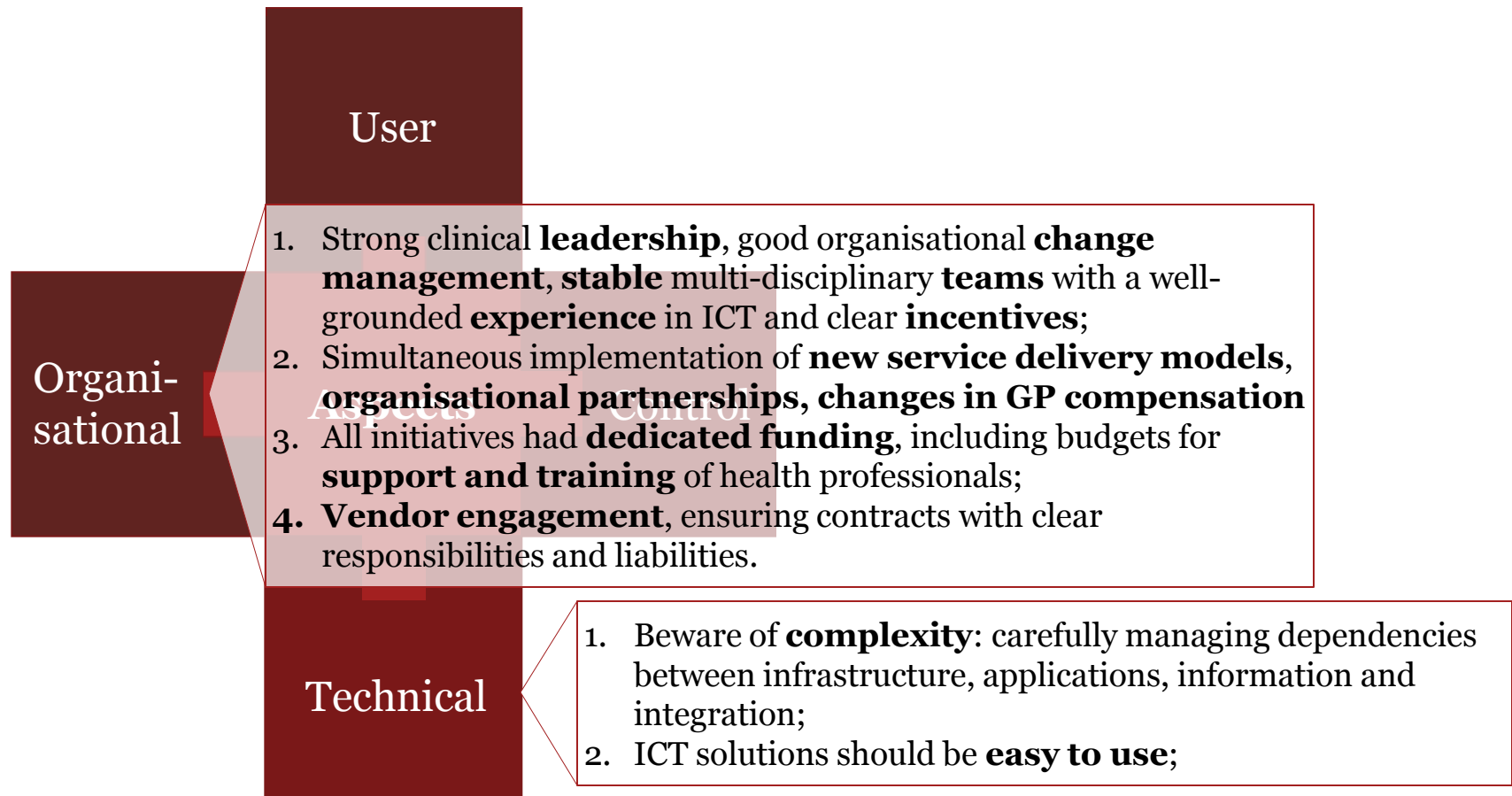
Item	Lesson learned	Coverage
Key success factors	High involvement between all stakeholders	2 out of 7
	Strong political and financial support to avoid future budget bottlenecks	1 out of 7
	Healthcare professionals should own and launch the projects affecting them	4 out of 7
	Quick deployment of service with minimum number of functionalities for field tests and adoption	2 out of 7
	Separating ICT infrastructure operations from patient information management	1 out of 7

Current project scopes are limited to regional or national interoperability but in the long term, pan-European interoperability solutions may come into focus

## *How to win user acceptance (1)*



## *How to win user acceptance (2)*



Seeing success in a long-term perspective with endurance and patience and the key factors above are recognised to win user acceptance.

# How did we validate the results?

Long list

- Master data: Project name, owner, country/region, current status
- Project data: Main objectives, expected results, implemented services, budget, project financing, options and limits of further analysis, information sources
- Conclusions and recommendations

deliverable



Short list

- Factsheet information: Is part of healthcare plan in the region/country?, details on sub-projects, project on track? Which parties involved and how managed? Common platform? Platform features? Compared to Luxembourg eHealth service priorities, financial information, governance / technical operation / information security rules, ...
- Comparison of stakeholder management, key success factors, project risks, governance structure, information security, key platform-related information, development vs. acquisition of interoperability framework, standards

deliverable

7 detailed factsheets + comparison chart



Validation

- Definition of socio-economic indicators and demographic criteria for comparison of healthcare environments
- Validation of the shortlist results by computation and comparison of the indicators in the analysed countries / regions

deliverable

Comparison chart

Country	Project Name	Owner	Current Status	Main Objectives	Expected Results	Implemented Services	Budget	Project Financing	Options	Limits of Further Analysis	Information Sources	Conclusions and Recommendations
Belgium	Belgium eHealth	Belgium eHealth	Completed	...	...	...	...	...	...	...	...	...
France	France eHealth	France eHealth	Completed	...	...	...	...	...	...	...	...	...
Germany	Germany eHealth	Germany eHealth	Completed	...	...	...	...	...	...	...	...	...
Italy	Italy eHealth	Italy eHealth	Completed	...	...	...	...	...	...	...	...	...
Spain	Spain eHealth	Spain eHealth	Completed	...	...	...	...	...	...	...	...	...
Sweden	Sweden eHealth	Sweden eHealth	Completed	...	...	...	...	...	...	...	...	...
Switzerland	Switzerland eHealth	Switzerland eHealth	Completed	...	...	...	...	...	...	...	...	...
United Kingdom	United Kingdom eHealth	United Kingdom eHealth	Completed	...	...	...	...	...	...	...	...	...
United States	United States eHealth	United States eHealth	Completed	...	...	...	...	...	...	...	...	...
Other	Other eHealth	Other eHealth	Completed	...	...	...	...	...	...	...	...	...



Table 1: Socio-economic and demographic criteria related to healthcare and eHealth matters<sup>24</sup>

Project	Country (region)	Number of inhabitants	GDP per capita EU€	Total expenditure on healthcare M€ (per capita PPP in €)	Total expenditure on eHealth M€ (% of total healthcare expenditures) *	ICT Take-up %	eGovernment take-up %	Insurance system	Practising physicians density per 1,000 population
Dossier Médical Electronique	France	61 840 270	33 090	193 119 (2 497.8)	2 003 (1.04 %)	80	59	Compulsory public health insurance	3.37
SiS-RA platform and its services	Rhône-Alpes (France)	6 065 969						Compulsory public health insurance	3.36 ---
EuroDoc Connect, regional eHealth platform	France (Corsica)	1195 244						Compulsory public health insurance	2.67 ---
Digital health record in Estonia	Estonia	1 341 369	20 840	1204 (744.8)	20 (1.68 %)	45	58	Compulsory public health insurance	
	Spain	44 310 870	31 485	99 001 (1 798.6)	1 166 (1.32 %)	43	47	Mix of public (60%) and private insurances	3.68
Strategic eHealth projects in Catalonia	Catalonia (Spain)	7 467 423						Mix of public (60%) and private insurances	
	Germany	82 772 160	35 402	255 034 (2 416.2)	2 981 (1.32 %)	54	45	Mix of public (60%) and private insurances	3.90
	Northern-Westfalen (NRW, Germany)	17 933 086						Mix of public (60%) and private insurances	
EPA 2015	Austria	8 333 109	37 085	26 661 (2 534.0)	309 (1.16 %)	54	60	Compulsory social insurance	3.75
EUGA (Electronic Health Record initiative)	Luxembourg	471 082	64 713	2 344 (3 861.3)	31 (1.32 %)	51	59	Compulsory public health insurance	2.87

<sup>24</sup> Sources:  
 --- OECD Data 2008, <http://www.oecd.org>, accessed 01/07/2010;  
 --- Figures from [www.businessmodel.com](http://www.businessmodel.com), accessed 23/07/2010, REP = Purchasing power parity;  
 --- Figures from 2008 provided or estimated by the "Business models for eHealth" report;  
 --- [http://ec.europa.eu/information\\_society/activities/ehealth/docs/ehealth\\_business\\_model/ehealth\\_report.pdf](http://ec.europa.eu/information_society/activities/ehealth/docs/ehealth_business_model/ehealth_report.pdf), accessed 01/07/2010  
 --- [http://www.press.in.tum.de/press/2010/05/05/eHealth\\_innovations/eHealth\\_innovations.pdf](http://www.press.in.tum.de/press/2010/05/05/eHealth_innovations/eHealth_innovations.pdf), accessed 07/07/2010;  
 --- European Commission, DG For Information Society and Media (2009) "Smarter, faster, better, equiscent", Ben Benchmark Measurement, November 2009;  
 --- [http://ec.europa.eu/information\\_society/europe2010/docs/determining/egov\\_benchmark\\_2009.pdf](http://ec.europa.eu/information_society/europe2010/docs/determining/egov_benchmark_2009.pdf), accessed 23/07/2010

LE GOUVERNEMENT  
DU GRAND-EST  
RÉGION DE L'EST

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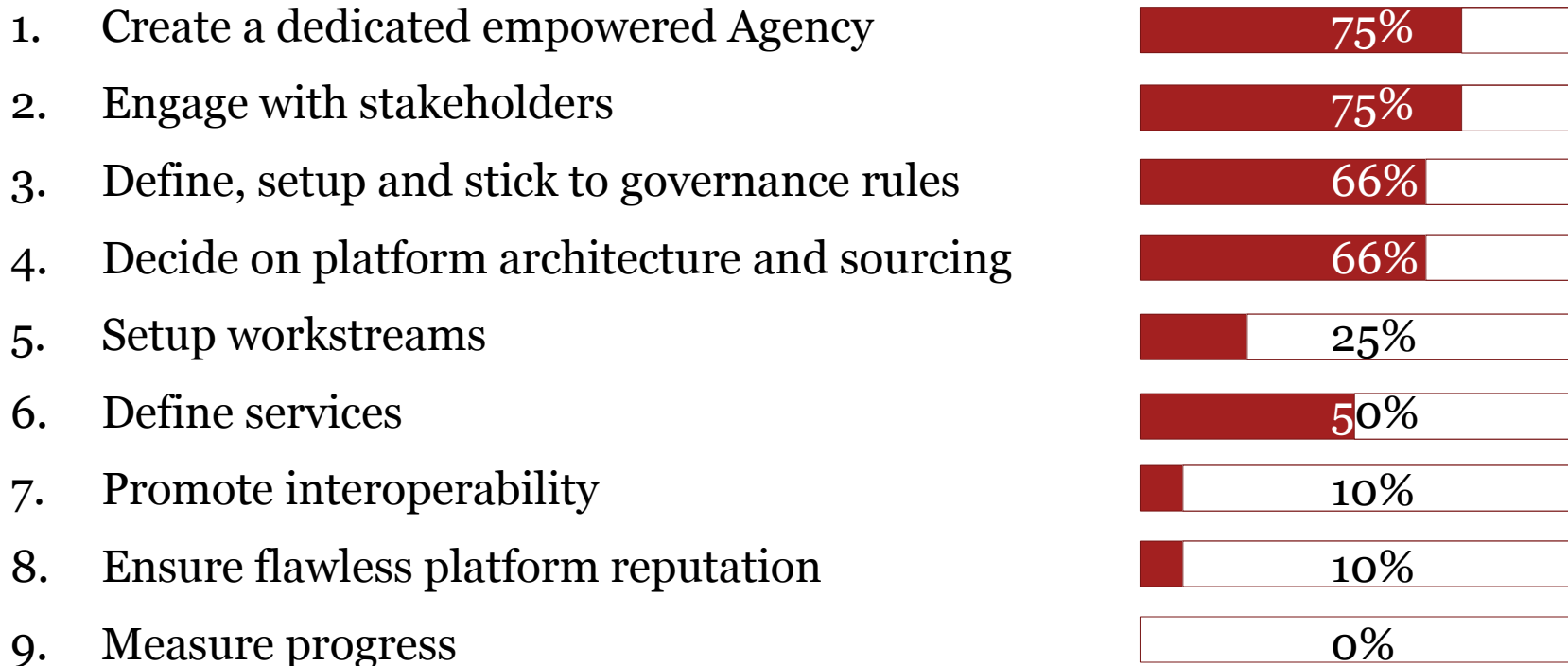
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- \*Luxembourg's eGovernment Take-Up indicator is the highest one among the selected countries. One of the main reasons is the launch of the new internet portal "de Guichet"

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# Recommendations

## Progress



## *How did we determine the benefits?*

### Influence factors

- Priorities of the eSanté programme
- Roadmap and main activities of the eSanté programme
- Platform requirements
- Services to be implemented

### Cost model

...

### 4 key assumptions

1. A sketch version of the future Agency (tasks, organisational structure, ...)
2. Defined workstreams (strategy definition, convergence and interoperability, services setup, data sharing and value-added services, scope definition and solution outline, other eHealth initiatives and upcoming projects)
3. Data hosting options, platform operations
4. Future hosted services, reference and lifecycle model for integrating new services and changes to existing services

### Benefits model

- Strategic objectives of the government;
- Benefits and their contribution to the government's strategic objectives;
- Benefit triggers;
- Beneficiaries.

Based on available knowledge, we drew a detailed sketch of the future, which was required to be able to estimate cost and benefits reliably

## *Top benefits (1)*

Trigger – How?	Benefits – What?	Beneficiaries – Who?
1. EHR and its services	better patient health, informed patients, holistic view on patient health, improved HC sector communication and decision-making, organisational efficiency, enhanced accessibility, effectiveness, efficiency, reduce redundancy	Patients, HC professionals, Care Delivery Organisations (CDOs)
2. Create and establish an empowered Agency	All forces of the HC sector combined, improved sector communication, reduced risk of redundant projects, synergy effects	All
3. Interoperability framework		Healthcare practitioners, CDOs, authorities
4. Clearly defined and implemented governance rules	Improved decision-making processes, better control environments, organisational efficiency, more efficient use of human and financial resources	All

## *Top benefits (2)*

Trigger – How?	Benefits – What?	Beneficiaries – Who?
5. Stakeholder engagement	Collaboration of all HC sector stakeholders	All
6. Ensure Information Security, quick time to market, usability/ICT solution ergonomics and stability	Best practice promotion, service adoption improved	All
7. Continuous Improvement Process	All forces of the HC sector combined, improved sector communication, reduced risk of redundant projects, synergy effects, better management decisions	HC professionals, CDOs, public authorities, patients
8. Define and execute measurement system		
9. Emerging projects incentives and financial support	Improved HC sector communication, financial incentives, more responsibility for results, promote best practice	HC professionals, CDOs, researchers

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# *Closing*

# 5

## ***Closing***

**All of you now define the future and  
all of you make it happen...**

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# *Questions?*

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# ***Thank you!***

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