



BIRRA eLadder Model Handbook – Version 3.0

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1. Introduction

The purpose of this document is to describe the BIRRA eLadder model and to guide the users in using the model for the assessment of their e-programmes. With e-programmes we mean programmes - or projects - that have as a common standard the use of information and communication technology, and more specifically the availability of broadband connectivity, for the sustainable development of - rural - regions.

This eLadder model is an outcome of the trans-regional BIRRA project. BIRRA stands for Broadband in Remote and Rural Areas. The project started in January 2005 and was completed in June 2006. The project is part financed by the Northern Periphery Programme with the balance of funding from the participating regions..

The regional partners in the project are:

- SWEDEN: Association of Local Authorities in the County of Västernorrland
- FINLAND: Regional Council of Kainuu and Regional Council of Lapland, Kemi Tornio Polytechnic
- SCOTLAND: Comhairle nan Eilean Siar and Western Isles Enterprise
- ICELAND: Icelandic Regional Institute, Iceland Telecom, IMG Deloitte, Township of Isafjordur, Municipality of Skagafjordur and Post & Telecom Administration of Iceland

The programme defined five meta-domains for e-programmes:

- e-Learning
- e-Work
- e-Health
- e-Government
- e-Business

You can find the definition we propose for those domains in the annex of this document.

The eLadder is a self-assessment & bench-learning development tool for these regional e-programmes /projects'. It can be used on the level of one regional or local programme or for peer-to-peer exchanges and as a comparator methodology among comparable programmes or projects.

With “self-assessment” in this context we mean the systematic and regular review of the strategy, objectives, processes, outputs and outcomes of a programme/project. The Self-Assessment process allows a programme management or public agency to discern clearly its strengths and areas in which improvements can be made and culminates in planned improvement.

Using the expression “bench-learning” we mean more precisely peer-to-peer exchange and exploration among programme managements or public agencies exchanging their experience.

In the actual development phase of the model, using it should produce two results:

- Testing of measurement indicators and developing further insight to refine the model
- The programme management and public agencies involved will learn from each other what worked and what did not work in the set up and running of the eServices/projects being analysed.

The focus of the model is on understanding & learning:

- ‘why what’ (strategy, objectives)
- ‘what is needed to make it happen’ (foundations, settings and enablers)
- ‘what are the results’ (service evaluation)
- ‘what should change to ensure you reach the top level?’ (transformation plan)

The design of the model started in the autumn 2005 with a workshop in the Western Isles, Scotland. It was further developed through discussions and meetings with regional partners and stakeholders in Iceland, Sweden, and Finland. The model was tested during workshops in:

- Finland (Kemi-Tornio University , eLearning readiness; Kajaani, evaluated Kainuu region on eLearning, eBusiness and eGovernment; Rovaniemi evaluated Lapland region eLearning, eBusiness and eGovernment)
- Western Isles (workshop on eLearning, eGovernment and eBusiness)
- Iceland (workshops on the service maturity model layer)
- & Sweden

Each test delivered further insights used to enhance the logic behind the architecture of the model and to perfect the indicators. Those tests were limited to specific services or domains. The full implementation has not yet been tested.

The development of the model is now in a phase where it can and should be implemented and used as a complete package. But the implementation of the model as a whole requires intense work and study. Self-evaluation capabilities are important but for the success of bench-learning exercises the support of third party facilitators will be needed.

The implementation will run more smoothly if it builds on existing collaboration and networks among public administrations. Ownership is important: only people and programmes with self interest in the learning process should participate. There must be a clear mandate and leadership buy-in for participation in bench-learning

The eLadder framework has an associated Excel workbook with different spreadsheets titled “BIRRA eLadder tool, version 3.0”.

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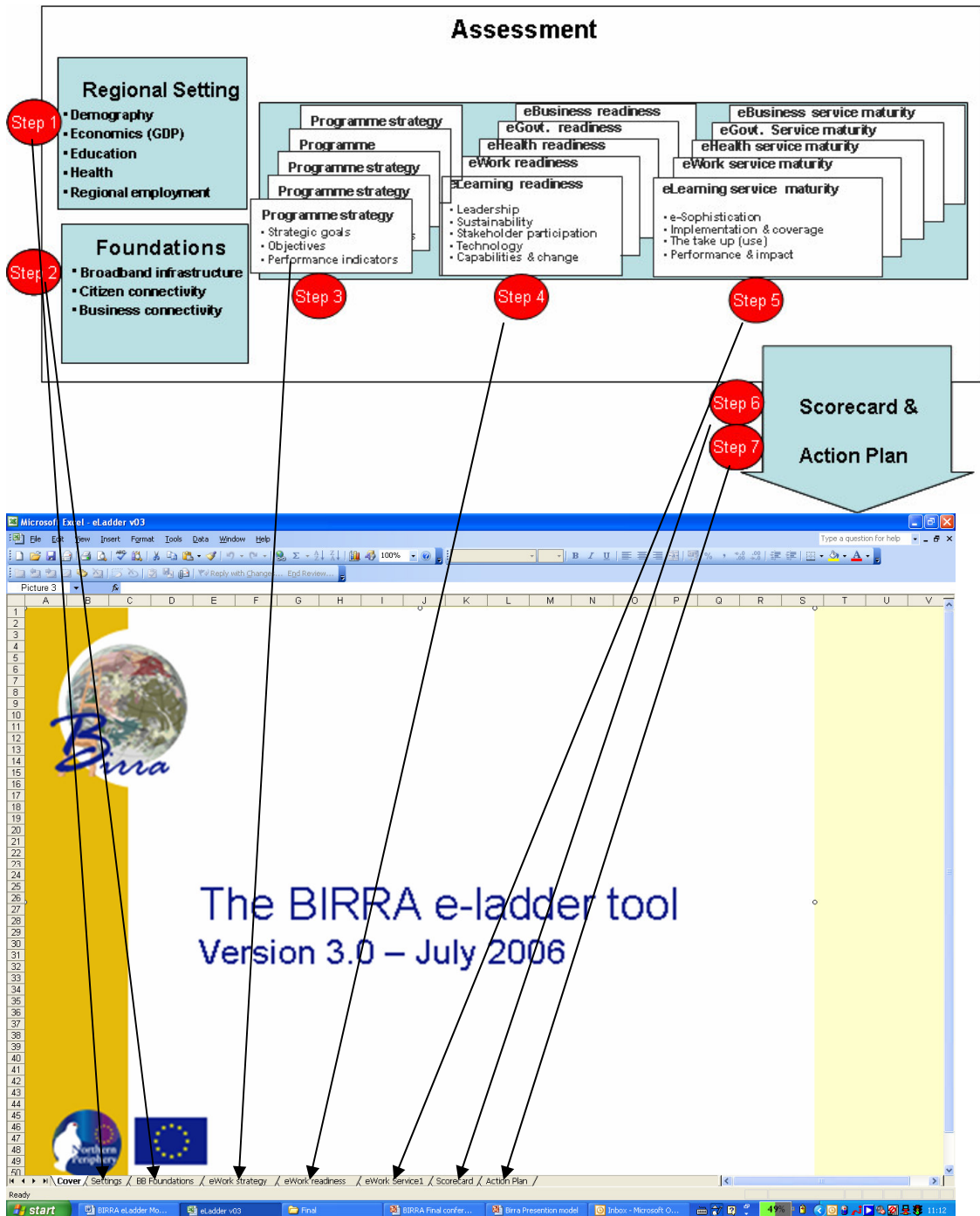
This Excel workbook reflects the actual development state of the model.

It is not using the most user-friendly technology one can imagine. A web-enabled interface to a database application would be more appropriate for further development.

In summary: this model is work in progress; the rest of this document will guide the user through the actual state of it.

2. The logic behind the eLadder model

The diagram below shows the logic behind the model and the architecture of the Excel workbook. We will first describe the logic as a whole and afterwards drill down to the levels of the different steps.



(The above screen-print of the tool provides an overview of the different sheets, limited to one service (eWork). The real workbook contains the sheets ‘... strategy’; ‘e... readiness’; ‘e... service 1’ five times for each of the domains).

1. Each (remote rural) region has its own specific “settings”: demography, GDP, employment (lack off), business environment that characterises the region and influences the strategy for the e-programmes/projects and the choice of e-services that could be developed. A first “**Regional Setting**” layer contains the indicators meant to map them;
2. To enable e-programmes/projects broadband should be available and used. Although this seems no longer an issue in most parts of Europe, for rural area’s this is not always the case. The second “**Foundations**” layer measures to what extent the region is connected to broadband;
3. Each regional actor should have a clear strategy, goals and objectives for each of their e-programmes (e-Work, e-Learning, e-Government, e-Health). In the “**Programmes strategy**” layers - one per domain - the strategic goals, objectives and performance indicators are mapped;
4. To deploy e-programmes in the domains of e-Work, e-Learning, e-Health, e-Government and e-Business requires specific ‘building blocks’ (strategy, people etc.): in the ‘**e... readiness**’ layers - one per domain - these building blocks are assessed;
5. The outputs of the e-programmes and projects will be (e-)services: services that will be delivered using the technologies and broadband networks. The maturity of these e-services in each of the domains is assessed in the “**e... service maturity**” layers: the ‘sophistication’ of the service and the ‘support’ are measured;
6. A ‘**Scorecard**’ provides a graphical overview of the readiness and maturity in each of the domains.
7. An ‘**Action Plan**’ provides a rudimentary template for the design of a plan based on the outcomes of the model.

This is the complete trajectory of the model, the exercise starting from the mapping of the structure of the region and the connectivity, the vision on the e-programmes, until writing of the action plan to go up the ladder. This is the trajectory that needs to be tested now.

The model also permits the different layers to be used separately: regional e-learning stakeholders can assess the readiness of their programme and the sophistication of some e-learning services. A project manager planning to implement a new service can use the readiness model as a check list (ex-ante evaluation).

This model is in a narrow sense not an impact measurement model: it assesses if objectives and related indicators are defined, if there is a system to measure them and to what extent the objectives are attained, but it does not provide the very concrete tool to measure these objectives. Therefore the model can be complementary to other models. The most elaborated impact measurement system for e-Services is actually the “eGep” model: (<http://217.59.60.50/eGEP>)

3. The regional settings layer

This layer contains indicators providing insight into the demography, the social and economic situation of the region, the political structure, and trends:

- The data to fill in the indicators should be researched by consulting secondary sources (the statistical office, existing recent surveys' etc.
- For the purposes of making comparisons between regions, regional GDP is generally expressed in purchasing power standards (PPS)
- The employment rate—also called the employment-to-population ratio—is the percentage of working-age people who have jobs (denominator is the source population, not the labour force)
- The unemployment rate is the number of employed people / the total labour force (Public Employment Agencies or related research centres provide those indicators)
- To make comparison accurate you are asked to fill in the reference period of the data
- For the political structure the project team must give a position from very low (--) over rather low (-), rather high (+), very high (++)

While these indicators have to be filled in on the basis of desk research by the programme owner's, the quotation of the political structure and the trends can be a first exercise during a workshop with stakeholders

The whole exercise should help to have a better insight into both the position and challenges of the region and will support the interpretation of the results of the e-ladder when compared to other regions

When different regions have completed the exercise, the indicators for each of the regions can be compared with the regional average and Eurostat data (Regional statistical yearbook).

The figure on the chart below represents the settings layer.

Demography		<i>Moment/period of measurement</i>
Population	<input type="text"/> #	<input type="text"/>
Population growth (per year)	<input type="text"/> % point	<input type="text"/>
Birth rate (/1000 - per year)	<input type="text"/> #	<input type="text"/>
Dead rate (/1000 - per year)	<input type="text"/> #	<input type="text"/>
Net migration rate (/1000 per year)	<input type="text"/> #	<input type="text"/>
Life expectancy at birth	<input type="text"/> Years	<input type="text"/>
Population density (km²)	<input type="text"/> #	<input type="text"/>
Gender (Male/Female)		
male	<input type="text"/> % of tot. pop.	<input type="text"/>
female	<input type="text"/> % of tot. pop.	
Age structure (Please specify)		
16-24	<input type="text"/> % of tot. pop.	<input type="text"/>
25-44	<input type="text"/> % of tot. pop.	
45-64	<input type="text"/> % of tot. pop.	
over 65	<input type="text"/> % of tot. pop.	
Medium age	<input type="text"/> #	
Highest level of education attained		
No formal education	<input type="text"/> % of tot. pop.	<input type="text"/>
Primary or lower secondary	<input type="text"/> % of tot. pop.	
Upper secondary	<input type="text"/> % of tot. pop.	
Tertiary (University, Masters, PhD)	<input type="text"/> % of tot. pop.	
Refusal	<input type="text"/> % of tot. pop.	
Income - Bands		
<1000€	<input type="text"/> % of households	<input type="text"/>
1000-2000€	<input type="text"/> % of households	
2100-3000€	<input type="text"/> % of households	
3100-4000€	<input type="text"/> % of households	
4100-5000€	<input type="text"/> % of households	
5100-7000€	<input type="text"/> % of households	
7100-10000€	<input type="text"/> % of households	
>10000€	<input type="text"/> % of households	

Economy					
Regional GDP	<input type="text"/>	€	<input type="text"/>		
GDP growth rate	<input type="text"/>	%point	<input type="text"/>		
GDP per capita	<input type="text"/>	€	<input type="text"/>		
GDP - composition by sector					
agriculture	<input type="text"/>	% of GDP	<input type="text"/>		
industry	<input type="text"/>	% of GDP	<input type="text"/>		
services	<input type="text"/>	% of GDP	<input type="text"/>		
Employment rate					
	<input type="text"/>	% of working age people	<input type="text"/>		
Employment Status					
Employee	<input type="text"/>	% of labour force	<input type="text"/>		
Self Employed (inc. family workers)	<input type="text"/>	% of labour force	<input type="text"/>		
Unemployed (unemployment rate)	<input type="text"/>	% of labour force	<input type="text"/>		
Student	<input type="text"/>	% of labour force	<input type="text"/>		
Other	<input type="text"/>	% of labour force	<input type="text"/>		
Number of enterprises					
Micro (1-9 employed)	<input type="text"/>	#	<input type="text"/>		
Small (10-49 employed)	<input type="text"/>	#	<input type="text"/>		
Medium (50-249 employed)	<input type="text"/>	#	<input type="text"/>		
Large (250+ employed)	<input type="text"/>	#	<input type="text"/>		
Political structure					
Centralised (--) >> decentralised (++)	<input type="text"/>	--	-	+	++
Compulsory national e-programmes	<input type="text"/>				
Tradition of strong public sector	<input type="text"/>				
Strong role for local democracy	<input type="text"/>				
Integration of horizontal structures	<input type="text"/>				
Integration of vertical structures	<input type="text"/>				
Trend to agency/network integration	<input type="text"/>				
Socio-economic trends					
Trend towards an ageing society	<input type="text"/>				
Trend towards a 'wellness and leisure society'	<input type="text"/>				
Trend toward a multicultural environment	<input type="text"/>				
Trend towards ecological awareness	<input type="text"/>				
Trend towards higher stakeholder requirements	<input type="text"/>				

4. The foundation Layer

This layer contains indicators concerning the broadband infrastructure. The broadband foundation indicators depend on the following criteria:

- The indicators are relevant for measuring broadband coverage and connectivity
- These indicators can be compared to existing criteria in the UNDERSTAND project and European Commission Information Society Benchmark system
- Data should be available, no extra surveys are necessary (e.g. providers data)

The use or take up of broadband is not taken into account (extra surveys needed).

By broadband we understand all kind of connections - *DSL, cable, wireless – other than telephone dial in - >2Mbps.

The figure below represents the foundation layer.

BROADBAND FOUNDATIONS		
Coverage		
Percentage of citizens living in areas served by broadband		Denominat Total popu
Percentage of business situated in areas served by broadband		Total numl
Broadband entry price		n.a.
Normalised 1Mbps price		n.a.
Percentage of citizens living in areas served by at least two always on technology over fixed network		Total popu
Percentage of business in areas served by at least two always on technology over fixed network		Total numl
Percentage of municipalities/local authority districts with PIAPs (Base: all municipalities-local authority districts)		Total numl
Number of Hot Spots/WI-FI per 1000 inhabitants		n.a.
Connectivity		
Percentage of broadband subscriptions per citizen		Total popu
Percentage of households with broadband connection		Total numl
Percentage of business with broadband connection		Total numl
Percentage of public schools with broadband connection		Totall num
Public Investment		
Number of projects by Public Authorities in the region involved in building broadband infrastructure for public/own usage		n.a.
Total value of public investment in the projects in the region for public/own usage (if possible per year from 2003 to 2006 included)		n.a.

5. The strategy layer

In this layer the long term strategic objectives of the programme or project are (re)formulated. For each strategic goal operational objectives and performance indicators are defined.

In the example below the file has been partially filled in for an e-Learning programme.

Programme Strategy

Name: Extension of Higher Education opportunities

Strategic goals

Objectives

Performance indicators

	Flexibility of delivery	Extend Market	Social Inclusion
			Enhancing skills
	Develop online materials	<-	Development of outreach centre <-
	Develop a Virtual Learning Environment	<-	24x7 access <-
	Develop online presence	<-	Enhance eLearning awarness <-
	Produce CDs	<-	Provide relevant programmes <-
	Nr. of people making online courses	<-	
	% of courses available online	<-	
	Nr. of courses available on Virtual Learning Environment	<-	
	Range of CD Rom materials across courses	<-	

6. The Readiness Layer

This layer assesses to what extent the building blocks for the e-programmes or projects are in place.

There are five criteria:

1. Leadership & Strategy
 - Is the strategy defined? If the previous layer is correctly filled in, the response is certainly positive for 50%. But is the strategy communicated and actively updated?
 - Is this strategy linked to a higher strategy for the region, or is it a stand alone approach?
 - Is the strategy communicated to the stakeholders?
2. Management & Organisation
 - Is the sustainable funding of your programme assured?
 - What about the management of the human resources?
 - Do you have the right skills in your programme team?
 - Do you have an appropriated programme management system?
3. Technology
 - Is there an infrastructure strategy in place?
 - What about technology standards?
 - What about the security issues?
 - What about your identity management system?
 - Are your applications integrated?
4. Customer focus
 - Is there a customer centric approach?
 - Are the needs of customers taken into account?
 - Is there a channel strategy?
5. Change & process change
 - Did you analyse the changes resulting from the programme?
 - Did you map your processes and the impact of the change on it?
 - How do you manage change?

For each criterion there are 3/4 questions to score. For each question a percentage must be filled in. The scoring must be done on the basis of interaction and consensus building.

The result will be an overall readiness percentage and a view on the strong points and weaker points in the specific programme management.

The figure below represents the readiness layer for an eGovernment programme.

eWork Readiness		OVERALL 0%					
Name Programme: <input type="text"/>							
Question	Criteria	Score	0%	25%	50%	75%	100%
1.1	Leadership & Strategy	0%	0%	25%	50%	75%	100%
Is the strategy for this project/programme defined? With clear priorities and objectives?			No strategy defined	Strategy defined but not documented	Documented strategy exists	Ownership of strategy is clear. Strategy widely communicated. Strategy clearly identifies objectives	The strategy is regularly used, linked to priority service outcomes, & key staff are highly aware
1.2		0%	0%	25%	50%	75%	100%
What links or impact does the project/programme have on the regional/national eWork strategy?			There is no obvious link with the regional/national strategy	There is an indirect link with the regional national strategy	Their are evident links with the regional national strategy	The project/programme supports the existing regional/national strategy	The project/programme has an impact on a renewed regional/national strategy
1.3		0%	0%	25%	50%	75%	100%
Is the project/programme clearly communicated to the stakeholders? Do they understand the eWork agenda? Do they have any involvement in the project/programme?			No clear communication. Key stakeholders are uninvolved and resist eWork ideas	Key stakeholders are aware of the project/programme although remain non-participative	Majority of the stakeholders are involved in the project programme	All key stakeholders are engaged and are committed to the project/programme	Key stakeholders pro-actively support the project/programme and have a thorough understanding of the eGovernment strategy
		0%					
2.1	Management & Organisation	0%	0%	25%	50%	75%	100%
Do you have a funding strategy? Is the long term funding guaranteed?			There is no clear funding strategy.	There is understanding of a range of funding sources and opportunities	Funding sources and opportunities have been identified and prioritised	The funding strategy identifies sources and opportunities, aligned to the needs of the project/programme	There is comprehensive funding strategy, linked to value delivery, which incorporates innovative use of sources and financial models
2.2		0%	0%	25%	50%	75%	100%
How do you manage the resources of the project/programme?			There is no clear commitment or understanding of the level of resource required	There are sufficient and appropriate resources available	Roles and responsibilities are understood	Roles and responsibilities are clearly understood and documented	Roles and responsibilities are fully understood and documented. Resource restraints have been considered and planned for
2.3		0%	0%	25%	50%	75%	100%
What have been your actions around skills required vs. skills available?			No skills analysis has been undertaken	There is awareness of skills gaps, but no detailed understanding	Comprehensive gap analysis has identified and prioritised deficient skills	A strategy is being developed to address the skills gap	A comprehensive strategy is in place which identifies tools, techniques, channels, and providers
2.4		0%	0%	25%	50%	75%	100%
Do you have an adequate project/programme management system for the eWork project/programme?			There is no project/programme governance or programme structure in place.	There is a project/programme plan but the project/programme structure is unclear with no obvious linkages between the streams	The project/programme is governed by a clear project/programme structure (board). There are clear documented linkages between project streams.	The project/programme plan and structure are regularly reviewed with all project streams aware of their key deliverables and timescales	There is clear direction from the programme structure. The critical path and dependencies are documented and well understood. All streams are fully

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		0%					
3.1	Technology	0%	0%	25%	50%	75%	100%
Do you have a infrastructure strategy? Does it take advantage of the existing national infrastructure projects ?		0%	Infrastructure strategy has not been considered	Development of an infrastructure strategy is underway	A strategy has been developed independently by the initiative	The infrastructure strategy takes into account National e-Gov guidelines	The infrastructure strategy incorporates learning and best practice from National e-Gov projects
3.2		0%	0%	25%	50%	75%	100%
How are your technology standards defined? Align with national guidelines?		0%	No technology standards are defined	Technology standards are in development	Technology standards have been defined within the initiative	Standards are being developed to align National guidelines	Standards compliant with National guidelines have been developed and published
3.3		0%	0%	25%	50%	75%	100%
What is your approach to security? Is your approach consistent with national standards		0%	There is no consideration of security	The relevance of security and its impact in the initiative is understood	A security policy or guidelines are in development	A security policy is being developed to align with existing National standards	There is a published security policy with conforms with National standards
3.4	0%	0%	25%	50%	75%	100%	
What is your approach to identity management? Is aligned with the national identity management system?	0%	There is no consideration of identity management	The development of and identity management system is ongoing	A identity management system had been developed	A identity management system has been developed aligned with the National identity management system (e.g. mutually recognised eID)	A identity management system aligned with the national identity management system is implemented and used.	
3.5	0%	0%	25%	50%	75%	100%	
Describe the capabilities of your applications e.g. do the application support operational / management needs? Integrate with other applications?	0%	The initiative has not developed applications	Application(s) support defined operational need	Application(s) support specific operational & managerial needs but generally do not integrate with other applications	Application(s) support operational needs as well as integrate with other applications	Business and Technology people are actively consulted in the design of applications which support operational needs and integrate with other applications	
		0%					
4.1	Customer focus	0%	0%	25%	50%	75%	100%
Is customer centric thinking embedded in the project/programme?		0%	The term 'customer' is not sufficiently understood or considered	'Customer' is discussed and considered as part of the service design	'Customer' is defined as user, business, PSCT staff, and relative needs are understood	Customer needs are formally and insightfully built into the service design process	'Customer' is central to the forefront of thinking, & their feedback is used to evolve the service
4.2		0%	0%	25%	50%	75%	100%
How have the services developed within the project been linked to the customer needs?		0%	There is no real understanding of which products or services are required	Products and services have been defined but no linked to customer needs	The products and services have been defined and mapped to the customer segments	The services have been defined and mapped and enabling processes and channels have been identified	A defined set of services has been marketed and tested with a range of customers throughout the value chain
4.3	0%	0%	25%	50%	75%	100%	
Do you believe these are the right channels for your customers? What plans do you have in place to migrate the customers to the desired channels?	0%	The relevancy of channels has not been considered	Customer use of existing channels and desire for alternative channels is understood	A business case has been developed for migrating customers to different channels	Technology enabled channel mix ensures timely and relevant access of services to all customers.	Technology enabled channel mix provides access to services and is analysed for delivery of benefits	
		0%					
5.1	Change & process change	0%	0%	25%	50%	75%	100%
What analysis has been completed on how your way of working will / has change as a result of the project/programme? What have you done with the findings?		0%	The impact on ways of working has not been considered	It is clear how the initiatives will impact ways of working	Future ways of working have been defined and the gap with the current state identified	Documentation of future way of working is underway	Documentation on new ways of working is in place. Required changes to behaviours, habits and mindset are understood
5.2		0%	0%	25%	50%	75%	100%
Will the current processes be impacted by the project? How will you / have you addressed this change?	0%	Processes have not been analysed	Current processes have been analysed	Future end to end processes have been defined and the gap with the current state identified	Documentation of future processes is underway	The end to end future processes are defined and documented; there is a migration path from current to future processes	
5.3	0%	0%	25%	50%	75%	100%	
How have you managed change so far? What are the future plans?	0%	Change is managed on ad-hoc basis	There are clear roles and responsibilities for change management	There is a change management plan which identifies key change activities	Change champions are focusing on engaging and mobilising people and building a commitment to change	Change management is integral to how the initiative operates and tools and support for change are seen as critical outputs	

7. E-Service maturity layer

The maturity layer is about the (self)-evaluation of the outcomes of the e-programmes
 The layer contains 2 concepts:

- Sophistication of the e-service
- Support of the (e-)service

Service to evaluate:

Question	Criteria	Score	0%	25%	50%	75%									
1	Sophistication	0%	Level 0	Level 1: Information	Level 2: Interaction	Level 3: Transaction									
What is the level of e-sophistication of the service ?															
			0 5 10 15	20 25 30 35 40	45 50 55 60 65	70 75 80 90 90									
	Support	Score	0%	25%	50%	75%									
2.1	Deployment		The service does not exist or is in a pilot phase	The service is implemented/covers 1/4 of relevant areas	The service is implemented/covers 1/2 of relevant areas	The service is implemented/covers 3/4 of relevant areas									
To what extent is the service implemented ?	Implementation and coverage														
	Subtotal		0 5 10 15	20 25 30 35 40	45 50 55 60 65	70 75 80 90 90									
2.2	Take up		0%	25%	50%	75%									
To what extent is the service used?	Use of the service		No evidence - no measurement of use	The service is used by less than 1/4 of the potential target group	The service is used by between 1/4 and 1/2 of the potential target group	The service is used by between 1/2 and 3/4 of the potential target group									
	Subtotal		0 5 10 15	20 25 30 35 40	45 50 55 60 65	70 75 80 90 90									
2.3	Performance measurement		0%	25%	50%	75%									
To what extent is there an evaluation system of the service in place?	Input, process, output, outcome		Performance indicators are not defined (input, process, output, outcome)	Performance indicators are defined but there is no evidence on measurement	Performance indicators are defined and measured	Performance indicators are measured and communicated									
	Subtotal		0 5 10 15	20 25 30 35 40	45 50 55 60 65	70 75 80 90 90									
2.4	Impacts		0%	25%	50%	75%									
To what extent are the objectives attained ?	Objectives / outcomes		The attainment of the objectives is not measured or is nil	The attainment of the objectives is very low (less than 25%)	The attainment of the objectives is rather low (25% - 50%)	The attainment of the objectives is rather high (50% - 75%)									
	Subtotal		0 5 10 15	20 25 30 35 40	45 50 55 60 65	70 75 80 90 90									
Total score		0%	<table border="0"> <tr> <td>0-33%</td> <td style="background-color: red;"></td> <td>Important to consider</td> </tr> <tr> <td>34-66%</td> <td style="background-color: orange;"></td> <td>Some warning signs</td> </tr> <tr> <td>67-100 %</td> <td style="background-color: green;"></td> <td>Good status</td> </tr> </table>				0-33%		Important to consider	34-66%		Some warning signs	67-100 %		Good status
0-33%		Important to consider													
34-66%		Some warning signs													
67-100 %		Good status													

The outcome of the programme/project is defined as an electronic service, in a case where no e-services are defined as outcomes, only the support concept can be used.

First of all the different levels of the e-service must be described. In order to measure the services for each of the partner regions a four-stage framework has been defined:

- **Stage 1 - Information:** Information concerning the public service and the delivery process is available on the official website of the service provider. (e.g. information concerning a social service, the conditions, the delivery process etc. are available)

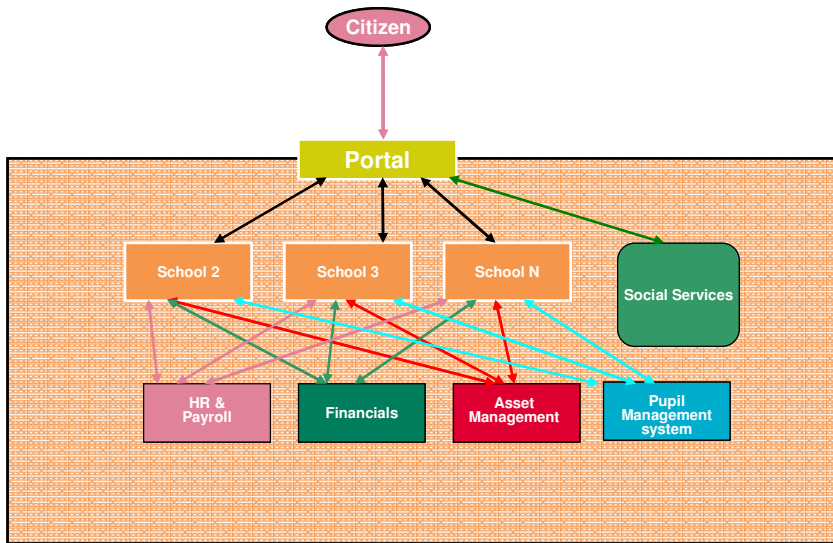
- Stage 2 - Interaction: the service provider offers the possibility of an electronic transaction concerning the service. (e.g. the procedure to obtain the social service can be started via an e-transaction)
- Stage 3 - Transaction: the service provider offers the possibility to completely handle the public service online. (e.g. the demand and delivery of the social allowance can be undertaken completely online).
- Stage 4 - Integration:
 - The delivery of the public service is interconnected with associated public services (e.g. the delivery of a social service is linked to other social rights; the services are delivered as a package)
 - The services providers are using shared back-office services (HR Management, Payroll, IT management, CRM, Asset Management, Finance)

It is possible that for certain services certain stages are not relevant. It is possible that for certain services the transaction level is not relevant or it can be unrealistic due to the actual state of the technological development. For example it could be considered that the service “building permission” can’t reach a transactional stage, due to the need to add building plans.

Stage 4 contains two aspects: service delivery integration and back office integration.

- For each public service, associated services exist. For example, if enrolment in a school is a relevant service, student grants, school transport, meals, etc. are services that could be or should be linked and proposed simultaneously. In other words when a parent is enrolling his child, he should have the possibility to apply for a student grant, transport services or the meals of the student.
- Broadband connections allow public service providers to share back office services. This will not only enhance the quality but it will be cheaper, which will enhance the efficiency of the public administration. Schools are a good example of the types of institutions that would benefit from the adoption of shared back office facilities – they are widely distributed and often “stand alone” organisations. For example for schools to have access to best practice systems and technology such as universal HR, library or pupil management systems.

The scheme below illustrates this concept of integrated services:

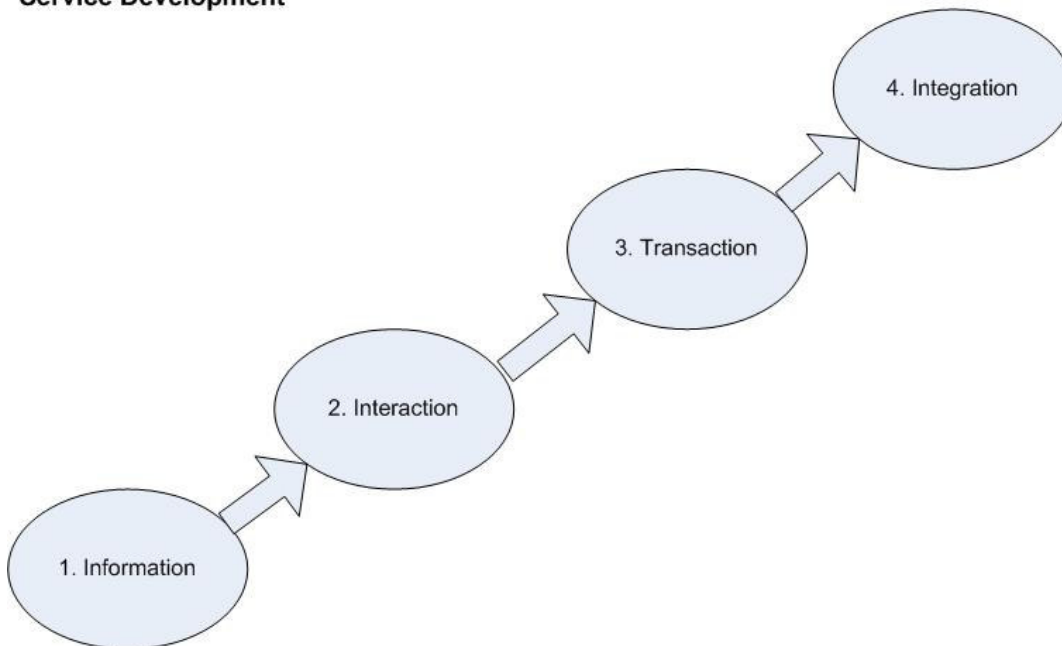


Besides these 4 stages a stage 0 was introduced to capture two possible outcomes:

- Total absence of any publicly accessible website managed by the service provider
- The public service provider has a publicly accessible website, but this one does not offer any relevant information, interaction, or transaction possibilities at all concerning the service.

The figure below demonstrates the scoring framework.

Service Development



The online availability of public services will thus be determined by the extent to which it is possible to provide the service electronically, or in other words to the sophistication of the online service provision.

7.1 Sophistication Score

The scoring of the services is based on a percentage system. The following table shows what percentage score a service will have depending on its level of sophistication.

BIRRA model
Stage 1 Information = 25%
Stage 2 Interaction = 50%
Stage 3 Transaction = 75%
Stage 4 Integration = 100%

7.2 Support Scores

Another important part of the scoring of a service is the support scores which cover deployment, take up, performance measurement and benefits/impacts.

Each of these support criteria is scored in a similar manner to the sophistication

Deployment

Deployment is the extent to which the service is implemented. There are five levels of deployment as described in the following table.

Level 0 – 0%	The service does not exist or is in a pilot phase.
Level 1 – 25%	The service is implemented/covers ¼ of relevant areas.
Level 2 – 50%	The service is implemented/covers ½ of relevant areas.
Level 3 – 75%	The service is implemented/covers ¾ of relevant areas.
Level 4 – 100%	The service is implemented/covers all relevant areas.

Take up

Take up is the extent to which the service is used. There are five levels of take-up as described in the following table.

Level 0 – 0%	No evidence – no measurement of use.
Level 1 – 25%	The service is used by less than ¼ of the potential target group.
Level 2 – 50%	The service is used by between ¼ and ½ of the potential target group.
Level 3 – 75%	The service is used by between ½ and ¾ of the potential target group.
Level 4 – 100%	The service is used by between ¾ and 100% of the potential target group.

Performance measurements

Performance measurement is the extent to which there is an evaluation system of the service in place. There are five levels of performance measurement as described in the following table.

Level 0 – 0%	Performance indicators are not defined (input, process, output, outcome)
Level 1 – 25%	Performance indicators are defined but there is no evidence of measurement.
Level 2 – 50%	Performance indicators are defined and measured.
Level 3 – 75%	Performance indicators are measured and communicated.
Level 4 – 100%	The measurements encourage change.

Benefits/Impacts

Benefits/Impacts are the extent to which the objectives are attained. There are five levels of benefits/impacts as described in the following table.

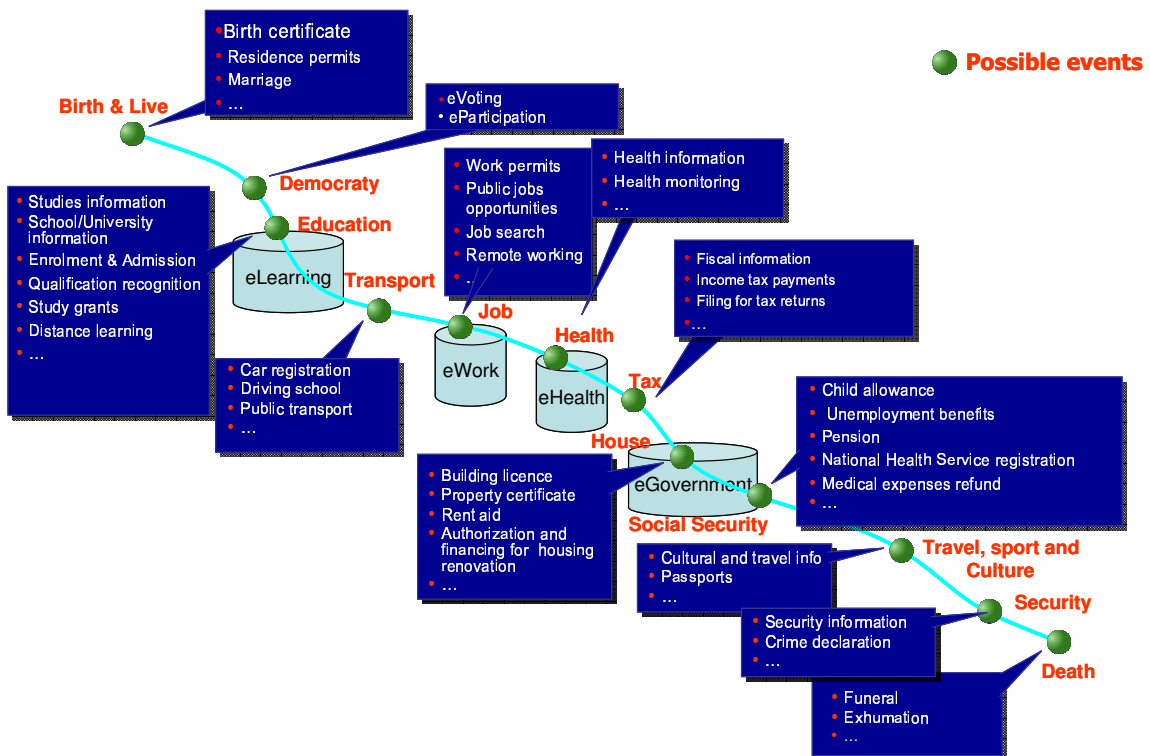
Level 0 – 0%	The attainment of the objectives is not measured or is nil.
Level 1 – 25%	The attainment of the objectives is very low (less than 25%)
Level 2 – 50%	The attainment of the objectives is rather low (25% - 50%)
Level 3 – 75%	The attainment of the objectives is rather high (50% - 75%)
Level 4 – 100%	The attainment of the objectives is high (75% - 100%)

7.3 Services

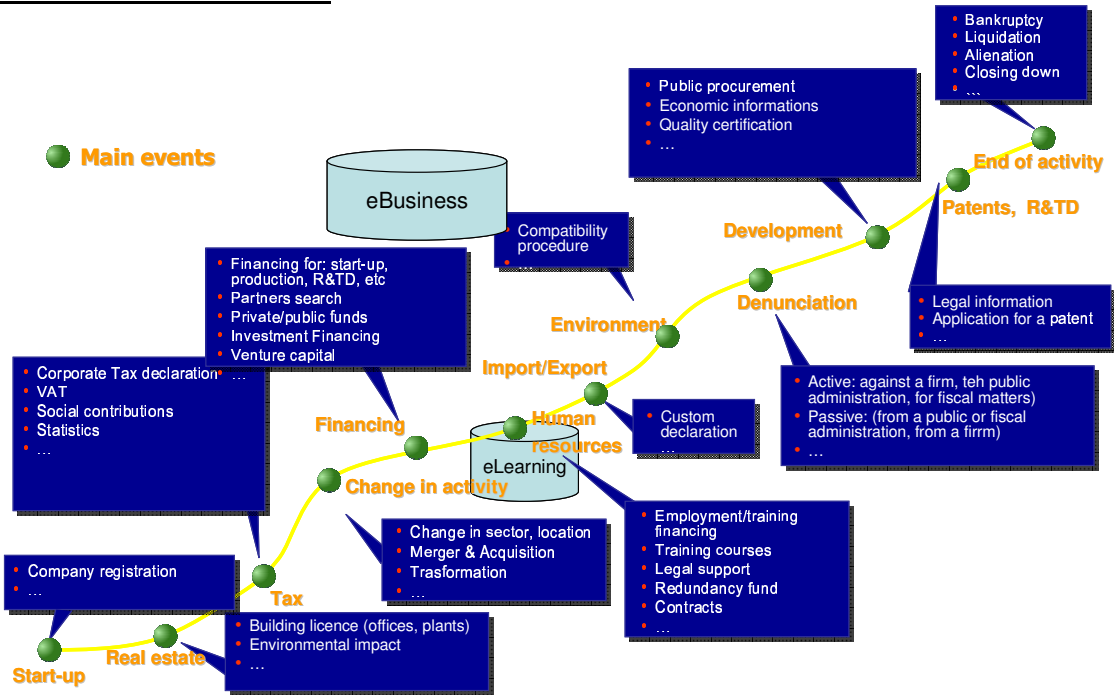
Services have to be defined in the fields of e-Government, e-Learning, e-Work, e-Health and e-Business. In annex 2 examples of e-services which were defined and tested during the BIRRA-project are listed.

The two graphs below are using this event-approach to list possible public services for citizens and business.

Life events for citizens



Main events for businesses



Step 1. Service Stages

Define the service and enter in the sophistication row the definition for each of the stages of the service.

Microsoft Excel - eLadder light version.xls

The service provider or the administrative responsible level does not have a publicly accessible website or this website managed by the service provider or by the administrative responsible level does not qualify for any of the criteria for the stages 1 to 4.

Service to evaluate: Applying for pre-school		Score	0%	25%	50%	75%	100%
1	Question						
2							
3							
4							
5	1	Sophistication	0%				
6	What is the level of e-sophistication of the service ?		Level 0: The service provider or the administrative responsible level does not have a publicly accessible website or this website managed by the service provider or by the	Level 1: Information: Information on the web-site: The information necessary to start the procedure to obtain unemployment benefits is available on a publicly accessible website	Level 2: Interaction: Electronic forms. The publicly accessible website managed by the service provider or by the administrative responsible level offers the possibility to obtain the paper form to start	Level 3: Transaction: Electronic approval and registration of students: The publicly accessible website managed by the service provider or by the administrative responsible	Level 4: Integration: Integration with local school system: Register the student Create a profile for the students etc. The publicly accessible website managed by the
7			0 5 10 15	20 25 30 35 40	45 50 55 60 65	70 75 80 90 90	95 100
8							
9							
10							
11	2.1	Support	0%				
12	To what extent is the service implemented ?	Deployment					
13		Implementation and coverage	The service does not exist or is in a pilot phase	The service is implemented/covers 1/4 of relevant areas	The service is implemented/covers 1/2 of relevant areas	The service is implemented/covers 3/4 of relevant areas	The services is implemented/covers all relevant areas
14		Subtotal	0 5 10 15	20 25 30 35 40	45 50 55 60 65	70 75 80 90 90	95 100

Step 2 Score Sophistication

There are two forms of scoring that can be used during the testing phase of the eLadder.

- **Simple Scoring:** Enter the sophistication score for the service. This should be 0, 25, 50, 75 or 100.
- **Complex Scoring:** A more complex method of scoring has been suggested by the Icelandic partners. This method allows a higher level of granularity of scoring for each of the stages. Each of the stages can be scored in multiples of 5% as follows:
 - Stage 0: from 0 – 15%
 - Stage 1: from 20 – 40%
 - Stage 2: from 45 – 65%
 - Stage 3: from 70 – 90%
 - Stage 4: from 95 – 100%

Microsoft Excel - eLadder light version.xls										
File Edit View Insert Format Tools Data Window Help										
E7 fx 50%										
	A	B	C	D	E	F	G	H	I	J
1	Service to evaluate: Applying for pre-school									
2										
3	Question	Criteria	Score			0%				
4										
5	1	Sophistication			50%					
6	What is the level of e-sophistication of the service ?					Level 0				
7						The service provider or the administrative responsible level does not have a publicly accessible website or this website managed by the service provider or by the				
8					50%		0	5	10	15
9		Support	Score		0%	0%				
10										
11	2.1	Deployment								
12	To what extent is the service implemented ?	Implementation and coverage				The service does not exist or is in a pilot phase				
13										
14			Subtotal				0	5	10	15
15										




Step 3 Support Scores

Enter the four support scores for the service. These scores should be 0, 25, 50, 75 or 100. Alternatively the complex scoring system from 4.4.2 can be used for the support scores.

8										
9		Support	Score	75%	0%					
10										
11	2.1	Deployment			The service does not exist or is in a pilot phase					TR
12	To what extent is the service implemented ?	Implementation and coverage							impleme	
13									rel	
14			Subtotal	75%		0	5	10	15	20
15										25
16	2.2	Take up			0%					
17	To what extent is the service used?	Use of the service			No evidence - no measurement of use					The serv
18										then 1/4
19										t:
20			Subtotal	50%		0	5	10	15	20
21										25
22										
23	2.3	Performance measurement			0%					
24	To what extent is there an evaluation system of the service in place?	Input, process, output, outcome			Performance indicators are not defined (input, process, output, outcome)					Perform:
25										define
26										evidence
27			Subtotal	100%		0	5	10	15	20
28										25
29					0%					
30	2.4	Impacts			The attainment of the objectives is not measured or is nil					The at
31	To what extent are the objectives attained ?	Objectives / outcomes								objective
32										
33										
34			Subtotal	75%		0	5	10	15	20
35										25
36										
37	Total score			63%						
38		0-33%		Important to consider						
39		34-66%		Some warning signs						
40		67-100 %		Good status						
41										
42										
Cover \ eGovernment Service 1 / eService 2 / eService 3 / eService 4 /										
Ready										

Total Score for Service

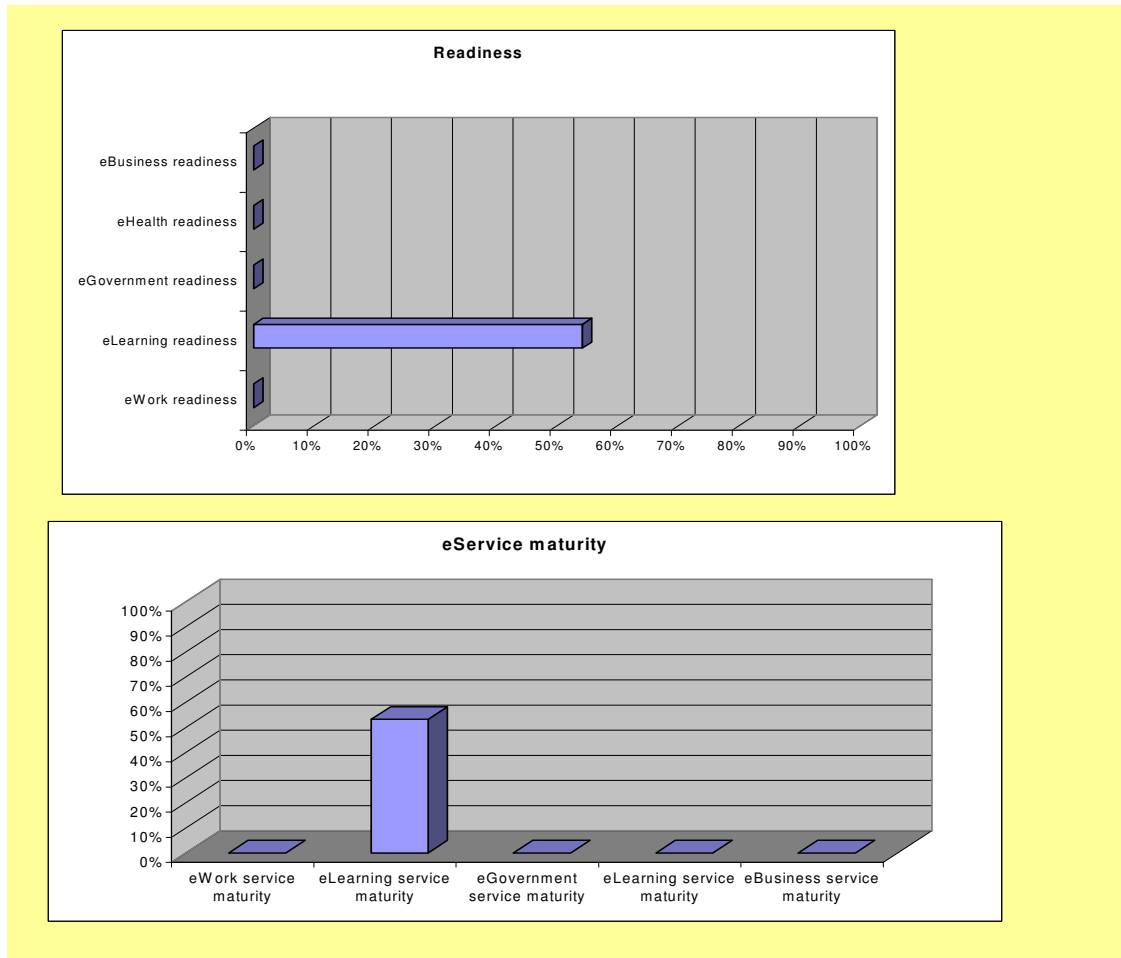
The total score for the service will be displayed at the bottom of the worksheet.

22														
23	2.3	Performance measurement		0%				25%						
24	To what extent is there an evaluation system of the service in place?	Input, process, output, outcome		Performance indicators are not defined (input, process, output, outcome)				Performance indicators are defined but there is no evidence on measurement						
25														
26														
27														
28		Subtotal	100%		0	5	10	15	20	25	30	35	40	
29														
30	2.4	Impacts		0%				25%						
31	To what extent are the objectives attained ?	Objectives / outcomes		The attainment of the objectives is not measured or is nil				The attainment of the objectives is very low (less than 25%)						
32														
33														
34														
35		Subtotal	75%		0	5	10	15	20	25	30	35	40	
36														
37	Total score		63%											
38		0-33%		Important to consider										
39		34-66%		Some warning signs										
40		67-100 %		Good status										
41														
42														
\ Cover \ eGovernment Service 1 / eService 2 / eService 3 / eService 4 /														
Ready														

8. The scorecard

A scorecard with two graphs provides an overview of the readiness and the eService maturity in the different domains.

The figure below provides an overview of the scorecard.



9. Action plan design

The model contains a template for the design of an action plan based on the results of the assessment.

For each domain the readiness and maturity level is mentioned. Actions can be defined, responsibilities appointed and due dates filled in.

Domain	Score	Actions	Responsible	Due date
eWork readiness	0%			
eLearning readiness	0%			
eGovernment readiness	0%			
eHealth readiness	0%			
eBusiness readiness	0%			
eWork service maturity	0%			
eLearning service maturity	0%			
eGovernment service maturity	0%			
eLearning service maturity	0%			
eBusiness service maturity	0%			

10. Annex 1: definitions of domains

e-Work

e-Work is a term extensively used in Europe, an amplification of the original 1980s and '90s concepts of Telework or Telecommuting: working at a distance using information and communications technology.

e-Learning

e-Learning most often means an approach to facilitate and enhance learning by means of personal computers, CDROMs, mobile devices and the Internet. E-learning, therefore, is an approach to facilitate and enhance learning through both computer and communications technology. Such devices can include personal computers, CDROMs, Television, P.D.A.s, MP3 Players, and Mobile Phones. Communications technology enables the use of the Internet, email, discussion forums, WIKIs, collaborative software, classroom management software and team learning systems.

e-Health

e-Health is an emerging field in the interaction between medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology.

- Electronic Medical Records: enable easy communication of patient data between different healthcare professionals (GPs, specialists, care team, pharmacy)
- Telemedicine: includes all types of physical and psychological measurements that do not require a patient to travel to a specialist. When this service works, patients need to travel less to a specialist or conversely the specialist has a larger catchment area.
- Evidence Based Medicine: entails a system that provides information on appropriate treatment under certain patient conditions. A healthcare professional can look up whether his/her diagnosis is in line with scientific research. The advantage is that the data can be kept up-to-date.
- Citizen-oriented Information Provision: both healthy individuals and patients want to be informed on medical topics.
- Specialist-oriented Information Provision: e.g. in an overview of latest medical journals, best practice guidelines or epidemiological tracking.

- Virtual healthcare teams: consist of healthcare professionals who collaborate and share information on patients through digital equipment (for transmural care).

e-Government

e-Government is the utilization of electronic technology to streamline or otherwise improve the business of government, oftentimes with respect to how citizens interact with it.

e-Government (from "electronic government," also known as e-gov, digital government, online government or transformational government) is the application of information and communications technology to enhance the effectiveness of a legislature, judiciary, or administration, either to improve efficiency or to change the relationship between citizen and government, or both. The primary delivery models are Government-to-Consumer (G2C), Government-to-Business (G2B) and Government to Government (G2G).

e-Business

e-Business is any information system or digital application that empowers business processes. Today, this is mostly done with web-based technologies. Electronic business enables companies to link their internal and external processes more efficiently and flexibly, work more closely with suppliers and partners to better satisfy the needs and expectations of their customers.

In practice, e-business usually includes e-commerce. E-commerce seeks to add revenue streams using the World Wide Web or the Internet to build and enhance relationships with clients and partners and to improve efficiency. Often, e-commerce involves the application of knowledge management systems.

E-business is more than just e-commerce. It involves business processes spanning the entire value chain: electronic purchasing and supply chain management, processing orders electronically, handling customer service, and cooperating with business partners. Special technical standards for e-business facilitate the exchange of data between companies. E-business software solutions allow the integration of intra and inter firm business processes. E-business can be conducted using the Web, the Internet, intranets, extranets, or some combination of these.

11. Annex 2 Examples of services per domain

e-Government

1. Citizen participation

Definition of the public service:

Different issues on which developers and decision makers want a view from the public

Research definition:

Standard procedure for citizen to express his/her opinion

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1 Information campaigns

Different issues on which developers and decision makers want a view from the public

- info on newspapers and other media
- internet as media/tool

Stage 2 Get feedback and instructions on

- how to express his/her opinion
- different possibilities / options
- further information on issue

Stage 3 Sending the opinion (citizen) and handling the result

- operational system / database
- analysing the results
- web-based feedback software

Attachments:

<http://www.scotland.gov.uk/Consultations/Current>

Stage 4 Automatic Feedback systems

Integration of feedback systems/software into several websites and generating and even publishing the results automatically in several forums (if required)

2. Applying for childcare, approval & payments etc (whole process)

Definition of the public service

- Apply for child care
- Payments and waiting list etc.
- Apply for day-care
- To apply for childcare place and get basic information on alternatives and payments

Research definition: Standard procedure for applying for day-care

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1

Information on a website, Information on childcare/kindergarten and applying for places

- alternatives
- costs (different cost categories)
- paying periods
- banking information.

Stage 2

Electronic forms and further information

- downloadable forms
- instructions on filling the forms
- sending the form

Stage 3

Decision/approval electronically

- information about the approval
- if place not available then acknowledgement immediately when a place opens

Stage 4

System integration between social and education sectors

- information available in schools (how many and who are about to start school in coming year)
- Information available in kindergarten (what alternative schools etc.)

- possibility to apply to school and get the approval (look at 'apply for preschool' -service level 2 and 3)

e-Learning

3. e-Learning portals for learning resources

Definition of the public service

- Access to learning resources for all levels
 - Each school should operate their e-Learning portal

Research definition

Standard procedure

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1

Info on website

The information necessary on the courses offered by each school

Material available on the web

- Documents
- Description on courses
- printable application forms

Other

- Streamed video lectures

Stage 2

- Apply for a course, webform
- Book time with tutor

Stage 3

Use of LMS (Learning Management System) and collaboration tools

- Forums
- chat rooms
- online-tests

Stage 4

Use of standards for interaction to other systems

- Personal profile (grade, finished courses)
- send grades between schools / public institutes
- e-CV (smart card)
- Access to related services (library, gym ...)

4. Complete courses for citizen (language, culture etc,)

Definition of the public service

Provide e-Learning course for subjects important for the region and are not offered elsewhere. i.e. such as language, culture etc.

Stage0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage1

Information about the online courses on website:

The information necessary to start the procedure to consult the catalogues of online courses to obtain specific information about the learning objectives available on a publicly accessible website managed by the service provider or by the administration.

Stage2

Searching for on-line courses. Access to search for courses online (get result), apply for participation in the course. The publicly accessible website managed by the service provider or by the administration offers the possibility to obtain the paper form to start the procedure to consult the catalogues of a public library to obtain a specific title in a non electronic way.

Stage3

Participate in an on-line course - digital material

Stage 4

Intelligent agents - integrating other information resources

Example: When course is finished send the pass/no-pass or grade information into personal CV database.

e-Health

5. Make an appointment with your doctor (general and specialist) On-line doctor

Definition of the public service

- Make an appointment with your doctor (general and specialist).
- At the local health clinic
 - make an appointment with your doctor
 - make an appointment with a specialist
 - make an appointment for radiograph; radiogram
- Health related services (interactive advice on the availability of services in different hospitals; appointments for hospitals)

Research definition

Standard procedure to obtain an appointment at a hospital officially recognised by a national, regional or local authority.

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1

The information necessary to start the procedure to obtain an appointment at a hospital is available on a publicly accessible website managed by the service provider or by the administration.

Stage 2

The publicly accessible website managed by the service provider or by the administration offers the possibility to obtain the electronic form to start the procedure to obtain an appointment at a hospital in an electronic way.
Reply to the patient by email.

Stage 3

The publicly accessible website managed by the service provider or by the administration offers the possibility of an electronic intake with an official electronic form to start the procedure to obtain an appointment at a hospital. Receptionists checks the request from the

computer and accepts it if it's ok. After acceptance automatic email to the doctor, nurse and patient.

Stage 4

The publicly accessible website managed by the service provider or by the administration responsible offers the possibility to completely treat the demand for an appointment via the website. Case handling, decision and delivery of a standard procedure to obtain an appointment at a hospital can be treated via the web.

When specialists decide the necessary tests and possible x-ray all the needed resources will make reservations automatically and all the required people and resources are informed.

No other formal procedure is necessary for the applicant via "paperwork"

6. On-line doctor

Definition of the public service

Health related services (interactive advice on the availability of services in different hospitals; appointments for hospitals)

Research definition

Standard procedure to obtain an appointment with an online-doctor recognised by a national, regional or local authority.

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1

Database on web: The information necessary to search the self-care instructions.

Stage 2.

Web form to ask instructions from the doctor for correct self treatment

Stage 3

When patient fills and sends the web form the record will be stored to the patient information system. When doctor analyzes the description he / she can make an appointment to the hospital electronically if needed. Email (or traditional letter) automatically to the patient.

Stage 4

Integrating services (e-prescription to pharmacy):

The publicly accessible website managed by the service provider or by the administration offers the possibility to completely process the demand of an appointment via the website. Case handling, decision and delivery of a standard procedure to obtain an appointment at a hospital can be treated via the web. When specialists decide the necessary tests and possible x-ray all the required resources will be reserved automatically and all the required people and resources are informed.

eBusiness

7. Brokering of product catalogue online - Common e-shop for the region

Definition of the public service

Product catalogue online such as access to information about booking holiday cottages and other tourism services.

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1

Product presentation:

Database on web: The information about products available from the region is available on a publicly accessible website managed by the service provider or by the administration.

Stage 2

Ordering products:

The publicly accessible website managed by the service provider or by the administration offers the possibility for searching and booking forms to start the procedure to buy a certain service/product.

Example : Find a cottage available for certain time and date,

Stage 3

Booking and paying online:

The publicly accessible website managed by the service provider or by the administration offers the possibility of an electronic access with an official electronic form to start the procedure to book and pay for a service.

Stage 4

Integrated supply chain with provider

Example: Automatic re-ordering when stocks are beginning to run out. Register for individual customers with information about what they have purchased and when. Detailed information about interests in certain products and what kind of service and spare parts they have bought earlier.
Another example: The customer can create “a bundle” of services/products and get price offers back!!

8. Opportunities for vocational training and for ICT product demonstrations to companies

Definition of the public service

- Counteract e-business skill-shortages in the market, e.g. by offering opportunities for vocational training and for ICT product demonstrations to companies.
 - Facilitate knowledge transfer between research centres and enterprises
 - Provide information on how to assess cost-benefits of e-Business
 - Provide incentives for conducting ICT training
 - Help SMEs to better understand organisational aspects of e-business, not just focused on technology
 - Identify good practices and communicate their benefits to SMEs
 - Stimulate the use of e-learning
 - Create opportunities for dialogue between SMEs

Research definition

- Procedure for offering training and product demonstration

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1

Printed and electronic information:

Database on web: (example) The information necessary to start the procedure to obtain an appointment at a hospital is available on a publicly accessible website managed by the service provider or by the administration.

Stage 2

Ordering products:

The publicly accessible website managed by the service provider or by the administration offers the possibility to obtain the paper form to start the procedure to obtain an appointment at a hospital in a non-electronic way.

Stage 3

Paying online:

The publicly accessible website managed by the service provider or by the administration offers the possibility of an electronic intake with an official electronic form to start the procedure to obtain an appointment at a hospital.

Stage 4

Integrated supply chain with provider.

Automatic re-ordering when stocks are beginning to run out.

Register for individual customers with information about what they have purchased and when. Detailed information about interests in certain products and what kind of service and spare parts they have bought earlier.

e-Work

9. Access to a business developmental program/office for home workers

Definition of the public service

For local e-workers (teleworkers)

The Process is:

- _ Create single point of contact for e-workers and clients
- _ Enquire on the web at www.work-global.com
- _ Download form for Skills Register registration
- _ Register on the Skills Register with your experience and qualifications
- _ Pro-active marketing undertaken to attract enquiries from client companies
- _ Distribute enquiries to suitably skilled people registered on Skills Register
- _ Interested candidates contact client directly (like a job interview)
- _ Engage in contract to provide services.
- _ E-worker can come to us for funding of any special requirements like project/contract specific training, equipment etc.

Stage 0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage 1 Info on website

Stage 2 Apply for a course, webform

Stage 3 Use of systems

Stage 4 Use of standards for interaction to other systems

10. Complete courses on how to Telework for citizens

Definition of the public service

Complete courses on how to Telework for citizen that is not provided elsewhere

Stage0

The service provider or the administration responsible for the delivery does not have a publicly accessible website or the website managed by the service provider or by the administration does not qualify against any of the criteria for stages 1 to 4.

Stage1

Information about the online library on website:

The information necessary to start the procedure to consult the catalogues of a public library to obtain a specific information carrier is available on a publicly accessible website managed by the service provider or by the administration

Stage2

Searching for books on-line.

Access to search for books online (get result), reserve books and videos online and apply for a loan-card.

The publicly accessible website managed by the service provider or by the administration offers the possibility to obtain the paper form to start the procedure to consult the catalogues of a public library to obtain a specific title in a non-electronic way.

Stage3

Borrow / order books or articles on-line

- digital material

The publicly accessible website managed by the service provider or by the administration offers the possibility to search for a specific information carrier (book, CD...).

Stage 4

Intelligent agents - integrating other information resources

The publicly accessible website managed by the service provider or by the administration offers the possibility to search for a specific title (book, CD...) and to make an electronic reservation or to obtain an electronic copy.