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1 Summary

The present deliverable D3.2 “Requirements Specification for ICT Impact Measurement Methodology” presents the requirements for the design of the ICT Impact Measurement Methodology.

The starting point for the identification of the method’s requirements was to specify the objectives of the ICT Impact Measurement Methodology. These are:

- To enable Public Administration (PA) decision makers to map ICT functionality groups (e.g. document management, eSignature) to their processes (that have been modelled with process building blocks): i.e. the PA will be able to know which Information & Communication Technologies (ICTs) can support a specific process and in what way.
- To calculate the impact of ICTs on PA processes. The impact may be negative (e.g. high training cost) or positive (e.g. time savings) on the processes, and may be qualitative or quantitative in nature.
- To identify areas of possible process re-organisation through the introduction of ICTs (based on similar patterns of ICTs on process building blocks).

The requirements for the ICT Impact Measurement Methodology have been identified according to the following perspectives:

1) User requirements: in order to identify user requirements, a semi-structured questionnaire was developed that was distributed to the Public Administrations involved in WP3 (CoA,CoT,CoW). The PAs completed the questionnaires and bilateral workshops were held with national technical partners as follows: COA & PLANET, COW & IWI-HSG and COT & CSI. The consolidated requirements for the three PAs are presented in Section 2.

2) Technical Requirements: technical requirements derive from the contractual objectives of the project as well as the dynamics of the project execution environment. These requirements are identified based on the relevant specifications of the Technical Annex and the discussions of a working group established among WP1 (IWI-HSG), WP2 (FILENET) and WP3 (PLANET) leaders as well as, SAP, ERCIS and CSI. The aim of this working group is to identify the synergies between the technical activities of the project and in particular the synergies between the mapping of ICT functionalities (key WP2 outcome) to process building blocks (key WP1 outcome) and how the impact of ICT functionalities on process building blocks can be measured , which is the focus of WP3.

The specifications will form the basis for the next task in WP3, i.e. Task 3.3 “Design of ICT Impact Measurement Methodology” that will produce an initial (unevaluated) ICT Impact Measurement Methodology. This will subsequently be evaluated internally by the three involved PAs (CoA, CoW and CoT) within the scope of Task 3.4. Based on the feedback, the final ICT Impact Measurement Methodology will be designed.

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2 User Requirements

In order to identify user requirements for the ICT Impact Measurement Methodology a semi-structured questionnaire was developed that was distributed to the City of Amaroussion (CoA), the City of Turin (CoT) and the City of Winterhur (CoW). The following approach was adopted for the design of the questionnaire:

- 1) The first set of questions aims to map the current ICT environment of the PA including ICTs currently in place and existing procedures for taking ICT investment decisions.
- 2) The second set of questions constitutes the main part of the questionnaire (and of the workshop). It aims to identify the ICT investment needs of the PA, focusing on the ICTs that the organisation plans to introduce in the next 3 years and information needs regarding the impact of ICTs on PA processes (which is the main focus of the PICTURE Impact Measurement Methodology).
- 3) The third part briefly maps the current process landscape of the PA , with a focus on whether the PA currently models its processes and measures the performance of processes.
- 4) Finally, the fourth part of questions deals with process re-organisation needs, and what type of information PICTURE is expected to provide in this respect.

The design of the questionnaire also took into consideration the questionnaires developed for the surveys in WP1 and WP2 and a number of questions were adjusted to the purposes of the given questionnaire. The sample questionnaire and guidelines provided is presented in Appendix I, including workshop logistic information¹.

The PAs completed the questionnaires and discussed/finalized them during bilateral workshops that were organised with national technical partners as follows: COA & PLANET (on 7/12/2006), COW & IWI-HSG (on 11/12/2006) and COT & CSI (on 14/12/2006).

The next sub-sections provide the synthesis of the answers and requirements by highlighting and analysing key information (to be used in the design phase).

2. 1. Overview of current ICT environment

1. Average level of ICT investment during the last 5 years

The average level of ICT investment was similar for the CoW (1.4 M€) and CoA (1.1 M€) in 2006. The CoT on the contrary had an average level of annual investment of 35 M€ during the past 5 years. The main difference lies in the greater size of the CoT than the other two cities.

Year	CoA	CoT	CoW
	Total ICT investment (Euro)	Total ICT investment (Euro)	Total ICT investment (Euro)
2002	n/a	30.986.000	1.100.000
2003	n/a	35.150.000	1.500.000
2004	n/a	36.000.000	1.300.000
2005	n/a	40.677.000	1.100.000
2006	1.100.000	35.650.000	1.400.000

¹ The completed questionnaires, as received by the three PAs are also available upon request.

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2. Organisational unit responsible for planning ICT investments

In all three PAs, the Central IT department is responsible for planning ICT investments. Moreover, higher level PA bodies are also involved in the process: in the CoW, the IT department collaborates with the PA's Steering Committee (and then approval is required by the executive government and parliament), in the CoA major investments (only) require the approval of the Mayor and Council, while in the CoT all decisions are evaluated by the executive manager.

3. Process for taking decisions on new ICT investment

The process for taking decisions on new ICT investment is similar in all three PAs. The process is usually initiated by a request of another organisational department or the Central IT department itself. The request is then reviewed by a higher level body (Steering Committee in CoW, executive manager in CoT and Mayor and Council in CoA for major investments only). Finally, the IT department implements the IT procurement procedures.

4. Current ICT infrastructure

Regarding the current ICT infrastructure, the three municipalities have a different standpoint:

Our specialized ICT procedures are detached from each other and are not integrated	CoA
Our specialized ICT procedures are coupled with each other at reasonable places by interfaces (n-to-m-integration)	CoT
Our specialized procedures are coupled with one another by an integration layer (e.g. workflow management system or enterprise application integration) (1-to-m-integration)	CoW

Table 1 – Current ICT infrastructure

5. ICTs currently in operation

The following table presents the ICTs currently in place per PA:

ICT	CoA	CoW	CoT
document management system (DMS)			
workflow management system (WFMS)			
business process management (BPM)		√	
eMail management		√	
records management	√	√	
electronic register		√	
digital archive / electronic archive system		√	
scanning / imaging / digitization / capture		√	
(web) content management System ((W)CMS)		√	

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ICT	CoA	CoW	CoT
forms management / form server			
virtual post office			
digital signature		√	
electronic payment procedures			
e-Procurement			
“Packaged ERP for Government”			
Geo Information System (GIS)	√	√	
Human resources (HR) system	√	√	
data warehouse			
Other	Accounting system, System for the development of new urban areas	Software Distribution, Intranet, Internet, Extranet etc.	

Table 2 – Existing ICTs in PAs

2. 2. Overview of ICT investment needs

1. Reasons for investing in new ICTs

All three PAs identified the following as the most important reasons to invest in new ICTs

- Law changes and new regulations
- Improvement and re-organisation of businesses
- Cross-linking with other administrations
- Adaptation of legacy systems

2. Factors that inhibit/restrain ICT investments

All three PAs identified the following as the key factors inhibiting ICT investments

- Budget restrictions
- Missing willingness to change
- Difficult integration of legacy systems
- Security aspects / data protection

3. Existence of ICT investment strategy

CoA: Not currently²

² Note that a strategy was developed (as a result of a project) for the period 2001-2006, however there are no plans to develop a new strategy for the next period. The main reasons for not having such a

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CoW: Yes

CoT: Yes

4. ICTs planned to be introduced in the next 3 years

The most attractive/needed ICT is a document management system, which is identified by all three PAs. The second most attractive ICT is forms management, which is required by CoW and CoT. The entire targeted lists are provided below.

ICT	CoA	CoW	CoT
document management system (DMS)	√	√	√
workflow management system (WFMS)		√	
business process management (BPM)		√	
eMail management			
records management			
electronic register			
digital archive / electronic archive system	√		
scanning / imaging / digitization / capture	√ (partly)		
(web) content management System ((W)CMS)			
forms management / form server		√	√
virtual post office		√	
digital signature			
electronic payment procedures		√	
e-Procurement			
"Packaged ERP for Government"			
Geo Information System (GIS)	√ (improvement of existing GIS)		
Human resources (HR) system			
data warehouse		√	
Other	Perhaps a decision support system and CRM		

Table 3 – ICTs planned to be introduced

5. Level of ICT investment foreseen in the next 3 years

process institutionalised are missing resources and know-how.

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Year	CoA (Euro)	CoW (Euro)	CoT (Euro)
2007	840,000	1,400,000	32,000,000
2008	n/a	1,200,000	30,000,000
2009	n/a	1,200,000	30,000,000

6. How decision-makers currently assess the impact of new ICTs on the PA

Out of the three PAs, only CoW assesses the impact of ICTs, by employing the Project Portfolio method (with monetary and strategic factors).

The CoA examines international best practices (i.e. ICTs used by municipalities in other countries across Europe)

The CoT does not perform any assessment currently.

2. 3. Current process landscape

1. Methods used to model the organisation's processes

All PAs have to some extent modelled their processes using established methods, however using a combination of methods and not for all processes.

CoT: Flowcharts, UML, XPDL and text format

CoA: processes are modelled using a combination of Flowcharts and text description

CoW: partly with Flowchart, Visio or ViFlow

2. Measurement of process performance

In two of the three PAs (CoA and CoT), the performance of processes is measured in some form.

CoA: the balanced scorecard is used in order to set goals and performance metrics. The measurement process is implemented according to ISO procedures

CoT: no established performance measurement method is used. However, information and non structured indicators are obtained from informatic solutions of Business Intelligence, such as:

- Distribution of the procedures in relation to the decision type
- Distribution of the procedures in relation to personnel
- Determined numbers of error and percentages
- Distribution of the procedures in relation to the Financial category
- Distribution of the procedures in relation to the state
- Distribution procedures related to the reference category
- Distribution of personnel in relation to the initiated procedures
- Distribution of personnel in relation to the number of activities carried out
- Average time spent in relation to the procedures
- Distribution of the procedures in relation to the referent

2. 4. Specific requirements for PICTURE

The PA's requirements from the PICTURE Tool (specifically, the impact measurement functionality) are presented per PA. The requirements are grouped in two categories:

- a) *Requirements on impact measurement*: this is the main source of information for designing the impact measurement methodology. It identifies the type of information needed from

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PICTURE, how this information can be obtained (through performance measures/indicators) and from what sources.

- b) *Requirements on process re-organisation*: two questions were addressed to explore whether and to what extent PICTURE is expected to assist organisations to improve their processes with impact measurement

CITY OF WINTERTHUR (CoW)

Requirements on impact measurement

Information we need from PICTURE regarding impact of ICTs on a process	Performance measures / indicators	Source of information / information "owner"
<p>Strategy</p> <ul style="list-style-type: none"> • Are the strategic goals of the city / city councils and the departments as well as those of the agencies and division supported? • Are the decisions conformant with the IT-strategy? Is the IT introduction value-focused? - Generally, the higher the level the higher the weighting • Are the project's results strategic outcomes and do they support the success factors? <p>Financial</p> <ul style="list-style-type: none"> • Is the investment contained in the short and long term finance and investment plan? • Investment costs? • Quantitative and qualitative increase in profit? • Cost of ownership incl. IT operating expenses? • Process costs? • ROI / Pay back • Multiple usage possible? • Prevention/reduction of redundancy? <p>Benefit (non monetary)</p> <ul style="list-style-type: none"> • Customer orientation • Level of adoption in administration • Number of users • Reputation of the city / marketing for the city <p>Risks</p> <ul style="list-style-type: none"> • Consequences of potential failure of the project • Humans resources 	<ul style="list-style-type: none"> • Reduction of costs / Maximization of quantifiable profit (CHF/EUR) • Effort reduction in hours • Hourly wage rate in CHF/EUR • Error reduction (in numbers) • Speeding up of the processes (hours) • Number of users of web presence • Avoidance/reduction of media breaks • Customer satisfaction (good / very good in customer surveys) • Number of complaints • Profile/reputation of the product to be invested in (Survey, journal articles) • Benchmarking data 	<ul style="list-style-type: none"> • Cost accounting / operational accounting • Financials • Time and activity recording • Customer survey • Human resources system (HR) • Diversity of line of business applications • Project-/Portfolio Management System • Benchmarking • Contacts with customers / Partners • Statistics of visits of eGovernment-/Internet-Pages

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<ul style="list-style-type: none"> • Technology • Impact on other applications • Reputation of the city 		
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Table 4 – CoW Requirements on impact measurement

An example of how the above four dimensions can be rated is as follows:

Score	low	Benefit assessment			high
Criteria	1	2	3	4	
Strategy					
Support of strategic goals	other	Agency / Division	Department	City council	
Finances					
Profit increase	negative	non		positiv	
IT operating costs	Will increase	No influence		Are being reduced	
workflows (internal costs)	Increased	No influence		reduced	
Benefit (non-monetary)					
Customer orientation	Worse	No influence	improved	Strongly improved	
Adoption	Workplace	Agency / Division	Department	City-wide	
Number of users	< 5	< 50	< 100	> 100	
Risks					
Consequences of project failure	Catasrophe	Economic loss	Loss of reputation	none	
Human Ressources	Not present		available	Freely available	
Technology	Poorly conceived	in trend	Field-tested	In-house teste	
Impact on other applications	High	medium	low	non	

Table 5 – CoW: Benefit Assessment Criteria and Scores

Requirements on process re-organisation

The main issues that require process improvement in the CoW are:

- Cost reduction
- Elimination of manual steps
- Reduction of errors
- Improvements in time
- Transparency

Finally, the answer to the question: "What information do you expect/need from PICTURE regarding the potential of ICTs on process re-organisation?"

The City of Winterthur does not expect immediate changes of established process structures. The development of transparent models regarding the current situation will improve the quality of processes (esp. considering the Continuous Process Improvements - CPI). Significant changes of process and organisational structures are possible in a medium-term period, but realistically not in short-term. However if the analyses identify potentials for effective (significant) improvements of course the changes will be respected by further projects

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CITY OF TURIN (CoT)

Requirements on impact measurement

Information we need from PICTURE regarding impact of ICTs on a process	Performance measures / indicators	Source of information / information "owner"
Customer satisfaction	Number of tasks handed over to the citizen to evade a procedure	<ul style="list-style-type: none"> • Normative data written in the law describing the tasks of how to accomplish a procedure • Citizen experience related to performing the procedures
	Number of actual places a citizen need to visit to carry out a procedure	<ul style="list-style-type: none"> • Data related to the geographic distribution of offices and main structures of the organisation
	Economic burden to distribute between the citizens for any procedure	<ul style="list-style-type: none"> • Normative data written in the law describing the tasks of how to accomplish a procedure • Citizen experience related to performing the procedures
Efficiency	Average time distributed over the different parts of a procedure	<ul style="list-style-type: none"> • Data deriving from the solutions created by Process Management for the control of the operational processes in the organisation
	Personnel hours/human resources spent by the Commune on a specific procedure	<ul style="list-style-type: none"> • Data deriving from the solutions created by Process Management for the control of the operational processes in the organisation
	Use of consumable resources distributed over a procedure	<ul style="list-style-type: none"> • Verified measurable data deriving from the organisational units • Data deriving from the solutions created by Process Management for the control of the operational processes in the organisation
	Number of paper documents applicable on a certain procedure	<ul style="list-style-type: none"> • Normative data written in the law describing the tasks of how to accomplish a procedure
Economic Evaluation of the Investment	Economic indicators (Internal Rate of Return, Break-Even Point)	Combined indicators

Table 6 – CoT requirements on impact measurement

Requirements on process re-organisation

The main issues that require process improvement in the CoT are:

- Time reduction
- Cost reduction
- Manual delivery reduction

Finally, the answer to the question: "What information do you expect/need from PICTURE regarding the potential of ICTs on process re-organisation?"

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CoT's expects from PICTURE to obtain the necessary information to choose the processes that need to be re-organised/improved and then use the correct methodology in order to realise and manage the change

CITY OF AMAROUSSION (CoA)

Requirements on impact measurement

In the CoA, a different approach was followed to identify the information requirements, by having a specific ICT in mind – in this case eSignature.

<i>Information we need from PICTURE regarding impact of ICTs on a process</i>	<i>Performance measures / indicators</i>	<i>Source of information / information "owner"</i>
Information on time savings	<ul style="list-style-type: none"> • Time saving of senior staff (responsible to sign) • Time required to complete the form • Effort of citizen to sign form (no need to physically go to the municipality) • Total time saving in form processing and delivery of requested certificate 	<ul style="list-style-type: none"> • Pre-eSignature estimations of average times (by senior staff) • Citizen satisfaction survey
Information on cost savings / expenditures (e.g. paper handling costs)	<ul style="list-style-type: none"> • effort re-allocation of involved personnel – to enhance efficiency • reduction in consumable costs (paper, etc.) • increase in cost for internet access • cost for investment in eSignature 	<ul style="list-style-type: none"> • Pre-eSignature cost of labour/effort (accounting system) • Pre eSignature consumable costs
Information on the number of manual steps that are eliminated	<ul style="list-style-type: none"> • Number of steps reduced 	Model of initial process
Information on number of media breaks reduced	<ul style="list-style-type: none"> • All steps performed online 	Model of initial process
Information on Data protection	<ul style="list-style-type: none"> • Qualitative information 	

Table 7 – CoA requirements for selected ICT example (eSignature)

Requirements on process re-organisation

The main issues that require process improvement in the CoA are:

- Number of steps reduced

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- Media breaks reduced
- Time savings
- Cost savings

Finally, the answer to the question: "What information do you expect/need from PICTURE regarding the potential of ICTs on process re-organisation?"

The CoA does not expect recommendations from the PICTURE tool. Information on the above issues (e.g. steps reduced, time savings) is sufficient in order to take appropriate decisions on process re-organisation.

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3 Technical Requirements

Although the present deliverable (D3.2) was meant to identify only user requirements according to the Technical Annex, it was considered useful to include also some technical requirements for the development of the Impact Measurement Methodology. This section aims to present the initial results of an on-going process for the definition of the PICTURE Tool's interrelated technical elements. In particular it presents the outcomes of a two-day workshop in Zurich among WP1, WP2 and WP3 leaders on 11-12 December 2006. The workshop had two objectives. The first and main objective was to finalize the mapping of ICT functionalities to process building blocks. The outcomes of this activity are presented in relevant WP2 documentation. The second objective was to identify the requirements for the identification of measurable process attributes per process building block. The outcomes of this second activity are presented in this section. But first, some general principles have been identified that should be taken into consideration for the design of the Impact Measurement Methodology.

3.1. General principles for ICT Impact Measurement Methodology

User driven approach

A key principle that will guide the development of the Impact Measurement Methodology, and indeed the starting point for this is to ensure that the methodology meets user's needs/requirements and brings measurable benefits to them. In the PICTURE context, the users targeted are primarily decision makers within PAs. Taking into account the ambitious objectives of the PICTURE project, the aim is to develop a methodology that is primarily user-driven and user-centric and at the same time technologically advanced. It is important to bear in mind that even the most innovative technologies will not have a true impact if they do not meet the actual needs of people.

User-friendliness

A second principle that should guide the design of the Impact Measurement Methodology is user-friendliness. Emphasis will be given on developing an easy-to-use methodology, with clear steps and intuitive support. The objective is to enable users to use the method by themselves, without the need of training. Moreover, the online interface of the methodology (to be developed at the last phase of the project as part of the PICTURE tool) should endeavour to be in line with common "touch-and-feel" IT environments.

Comparative applicability across time

The third principle that should be taken into account in the Impact Measurement Methodology is the "comparative applicability" of the methodology across different time periods. According to the feedback obtained from the workshops with PAs, as well as discussions among the technical partners of the project, it has been agreed that the Impact Measurement Methodology shall have to produce data that can be compared to the existing situation within Public Administrations. An alternative would have been to compare PICTURE's data to a benchmark, however there is no such uniform pan-European performance benchmark for the public sector to our knowledge.

In order to be able to compare PICTURE data to the current situation, this can be achieved either by asking PAs to collect comparable information on their existing situation on their own, or to support this through the PICTURE tool in some form. This shall be technically explored

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during the design and implementation phase of the tool.
The main idea can be illustrated also as follows:

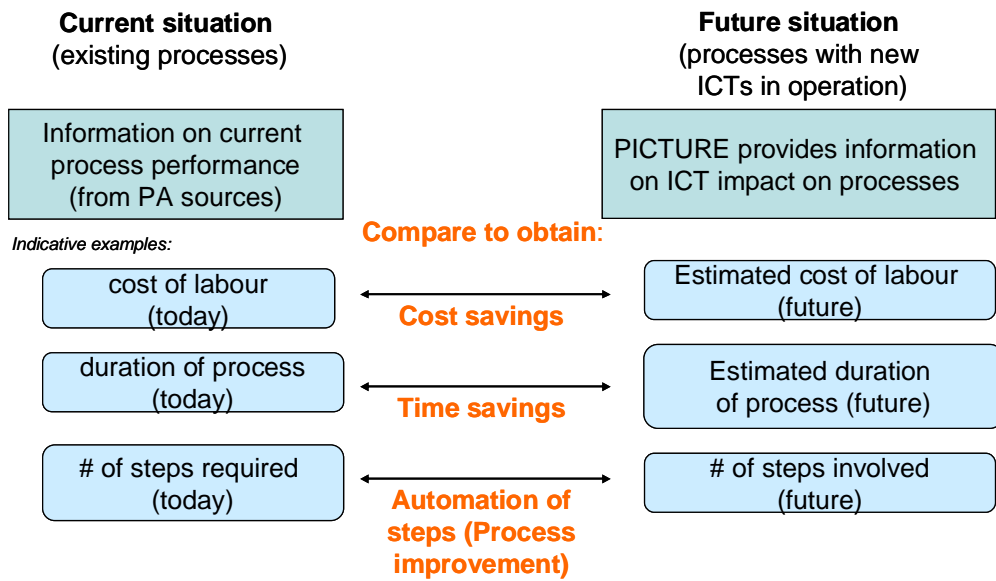


Figure 1 – Comparative applicability principle

Generic cross-PA applicability

A final equally important principle is that the Impact Measurement Methodology should be broadly applicable in any public administration across Europe. In order to achieve this, the design of the methodology should not be based only on the user requirements of the three Public Administrations (CoA, CoW, CoT), but moreover on state-of-art methods in the area of ICT performance measurement. The key input for the identification of best practices will be the state of art analysis presented in D3.1 “Study on ICT Value Analysis Concepts for European PA”.

Focused impact generation for specific PA processes

Moreover, one challenge that needs to be taken into consideration is that the methodology, while generic in its application across any type of PA should be able to identify measurable impact of ICTs on the specific processes of a PA. There is a risk that because the methodology is based on generic Process Building Blocks, it will not be able to identify the added value of the ICT impact on the specific process context of a PA.

Unbiased approach

Finally, a key requirement is that the Impact Measurement Methodology should be unbiased in its approach. In other words, it should allow for the objective identification of positive, negative or indifferent impact, rather than “direct” the generation of positive impact.

3. 2. Logic of the ICT Impact Measurement Methodology

In order to proceed in the identification of technical requirements for the methodology, it is necessary to have in mind the logic of the methodology.

In one sentence, the Impact Measurement Methodology aims to measure the impact of ICTs

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on the processes of a public administration.

The main logic of the Impact Measurement Methodology can be illustrated at a high-level in the next figure.

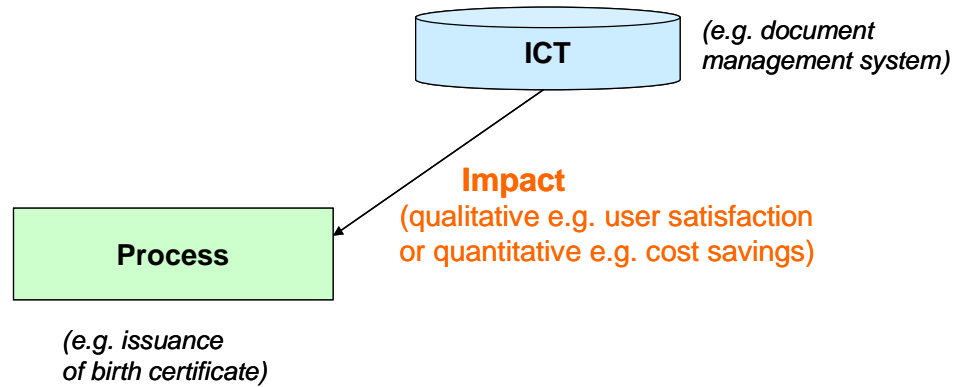


Figure 2 – High level logic of ICT Impact Measurement Methodology

This logic, is further elaborated in the next figure, where a “workable” layer of abstraction is defined based on the working concepts defined in the other relevant work-packages. Specifically, ICTs are decomposed in ICT functionalities (the main outcome of WP2), whereas Processes are decomposed in Process Building Blocks (the main outcome of WP1).

There are two levels of impact that an ICT functionality can have on a PBB:

- The ICT can support the PBB (without improving or degrading the current situation)
- The ICT adds value to the PBB and the process to which it is part of

The second is the main objective of PICTURE. As such, PICTURE will propose all ICT functionalities that add value/improve the current processes, targeting primarily the most optimal ICTs (e.g. integrated solutions). However, less optimal solutions will also be presented for comparison purposes. For example, a current process which is supported by sending a form by fax, can be improved by sending it via e-mail, however further improvements can be achieved by an email management solution (perhaps integrated in a web-based intranet environment), which would be the most optimal solution.

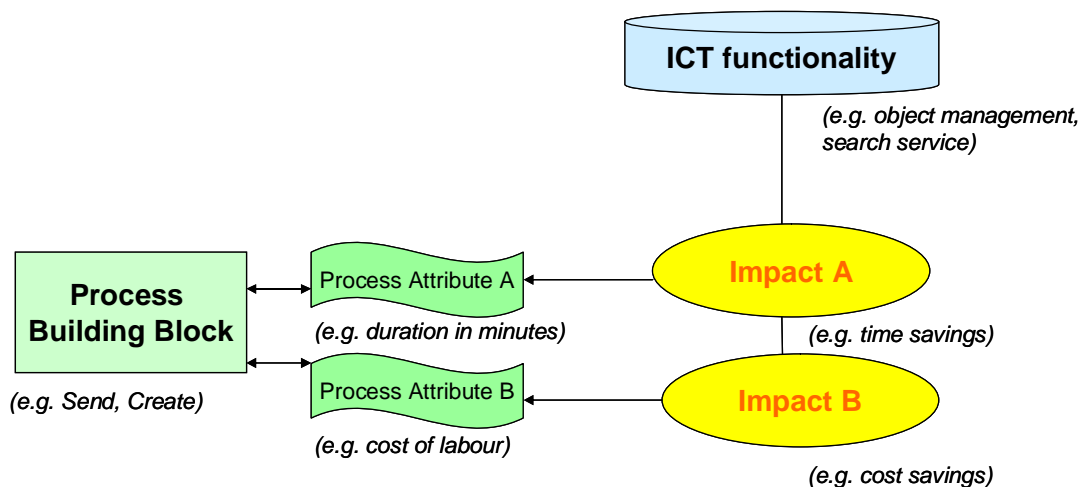


Figure 3 – Elaborated logic of ICT Impact Measurement Methodology

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In order to measure the impact of ICT functionalities on Process Building Blocks (PBBs), measurable process attributes need to be defined. Process attributes are characteristics of a process building block that provide needed information in order to assess the impact.

For example, the Process Building Block “Print” is further analysed in the next Figure. Assuming that the current process is supported by some form of printing involving human interaction with the support of a printer, it is envisaged that a process improvement can be achieved by supporting this PBB with the ICT functionality “Publishing Services” coupled with “System Integration Services” that enables an electronic document to be printed in real-time or batched. (Note that if the original format of the document is not electronic, this PBB could be linked to the PBB “Scan”).

In this case, the following set of measurable process attributes can be identified, corresponding to relevant areas of desired impact:

- Cost of consumables (at present vs. with new ICT) → cost savings
- Duration of printing (at present vs. with new ICT) → time savings
- Addressee data protection/privacy (at present vs. with new ICT) → enhanced privacy
- Necessity (at present vs. with new ICT) → freed up labour and/or reduced media breaks

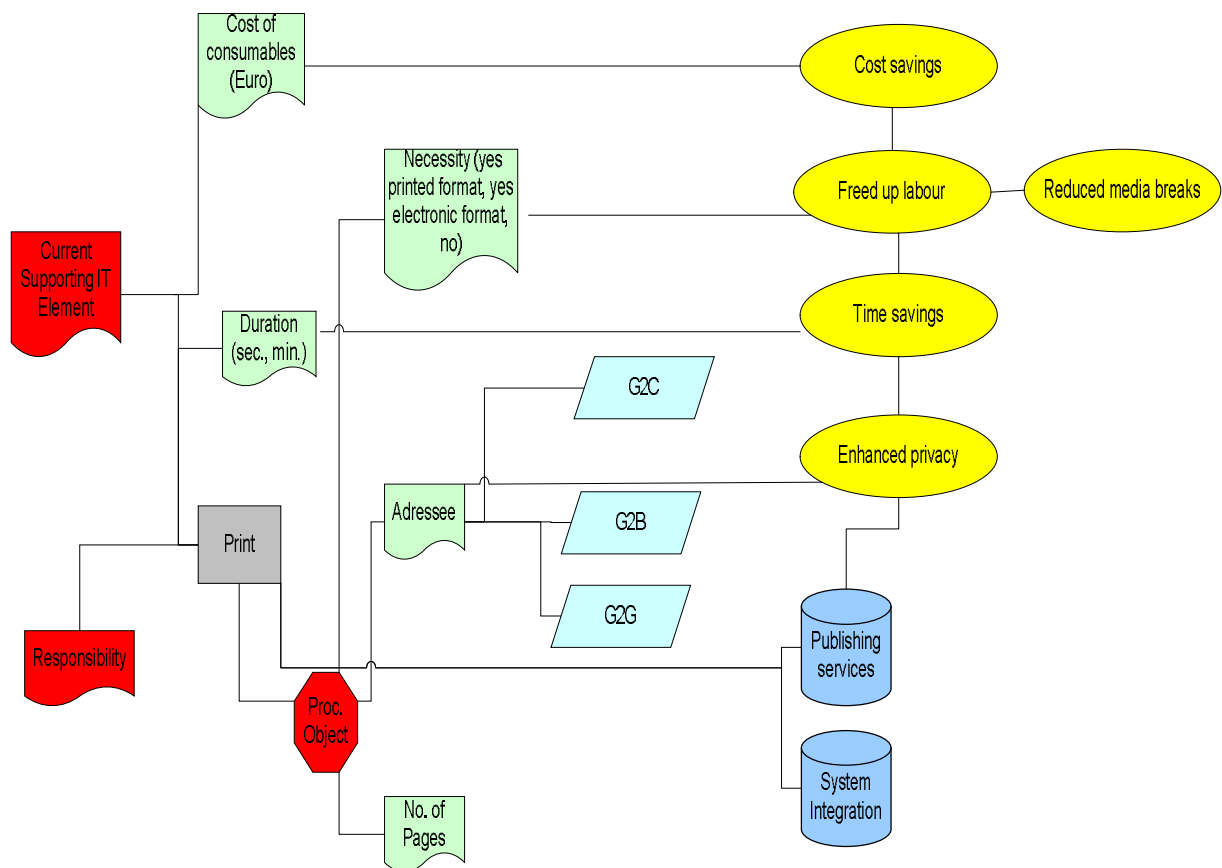


Figure 4 – Example of ICT Impact on PBB “Print”

Impact diagrams such as the above, will be developed for all identified Process Building Blocks during the design of the Impact Measurement Methodology (Task 3.3).

One other possibility to be examined during the design phase is the idea (mentioned in the Contract’s Description of Work) to group processes in clusters (i.e. processes that have strong

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structural analogies regarding their ICT potential, such as payment cluster, authentication cluster etc.) and then to identify the impact of ICTs according to these clusters.

3. 3. Impact dimensions and indicative performance indicators

The process attributes will be identified vis a vis 3 key dimension areas: time, resources and quality. These dimensions are in line with the majority of ICT value analysis concepts (identified in D3.1). Moreover, the impact will be identified primarily from an internal Public Administration point of view. However, where an ICT has direct impact on end-users (citizens and businesses interacting with the PA), they will be acknowledged, since end-user satisfaction is a key driver of PA performance.

The next table indicates the targeted impact areas and indicative performance indicators for each dimension of impact.

Dimension of impact	Targeted Impact Area	Indicative Performance Indicators
Time	Faster processes	<ul style="list-style-type: none"> • Execution time (minutes) [i.e. the total time required to produce a defined output³ within a process] • ICT supported execution time (minutes) [i.e. the time required to execute ICT supported tasks. This is a part of the total execution time] • Idle time (minutes) [i.e. the waiting time in between two tasks] • Delivery time (minutes) [i.e. the time required for the delivery of a result within the PA or to an end-user] • Physical transport time (minutes) [i.e. the time required for a person to get to a different location, if the presence of a PA employee at a certain place is necessary e.g. in order to perform an inspection].
Resources	Reduced labour costs ⁴	<ul style="list-style-type: none"> • Average employee hour rate (Euro/hour) [this is measured in conjunction with the execution time]
	Reduced telecommunication costs	<ul style="list-style-type: none"> • Average telecommunication cost per month (telephone & internet)
	Reduced consumable costs	<ul style="list-style-type: none"> • Average paper handling costs per month • Average ink costs

³ Note, these are referred to as processed objects within other WP1 and WP2 deliverables and will be defined during the implementation of the PICTURE tool

⁴ This excludes personnel involved in supporting or developing ICT operations, as they are included as a separate impact area

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Dimension of impact	Targeted Impact Area	Indicative Performance Indicators
		<ul style="list-style-type: none"> • Average other consumable costs (e.g. folders, pens, notepads)
	Reduced storage space & cost	<ul style="list-style-type: none"> • Physical storage space (in square M) • Average storage filing costs per month e.g. folders, boxes, separators
	Benefits due to replacement of old system/ICT [if applicable]	<ul style="list-style-type: none"> • Once-off cost savings [from the avoidance of maintenance of the old system]
	ICT market cost ⁵	<ul style="list-style-type: none"> • Average market cost of such an ICT
	ICT development costs [should the PA wish to develop the ICT in-house]	<ul style="list-style-type: none"> • Average personnel cost for developing ICT • Average hardware costs for developing ICT • Average software costs for developing ICT • Average installation costs
	ICT operation and maintenance resource costs [the cost for operating and maintaining the given ICT]	<ul style="list-style-type: none"> • Host, Server, Network, Line/communication costs (initial set-up cost & monthly cost) • Cost of workstation computers and hardware consumable (initial set-up cost & monthly cost) • Reduction in system redundancies⁶ (initial set-up cost & monthly cost) • Average annual software maintenance cost • Average annual hardware maintenance cost
	ICT operating personnel costs	<ul style="list-style-type: none"> • Number of persons required to support ICT's operation (IT support personnel) • Average time (number of hours/month) required for IT support personnel • Average employee rate / hour for IT support personnel • Number of persons involved in the execution of processes supported by ICT • Average time (number of hours/month)

⁵ Given that the market cost usually outweighs in monetary terms any positive impact, the targeted impact for this and other IT related costs is to show that the monetary value pays-off in the long-run vis a vis the other areas of positive impact (e.g. time and quality).

⁶ A system redundancy is a component of a computer or network system that is used to guard the primary system from failure by acting as a back up system. Redundant components can include both hardware elements of a system -- such as disk drives, peripherals, servers, switches, routers -- and software elements -- such as operating systems, applications and databases.

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Dimension of impact	Targeted Impact Area	Indicative Performance Indicators
		required to execute ICT supported tasks <ul style="list-style-type: none"> • Average employee rate/hour for PAs involved in processes • Changes required in job descriptions and change management • Training required to operate ICT
Quality	Easier/ Better processes	<ul style="list-style-type: none"> • Number of steps eliminated • Number of steps automated • Number of media breaks removed • PA employee job satisfaction • End-user service satisfaction • Easier accessibility of processes • Standardisation of processes • Improved external image of PA
	More accurate processes	<ul style="list-style-type: none"> • Number of errors reduced • Automated quality checks introduced
	More transparent processes, accountability and monitoring	<ul style="list-style-type: none"> • Visibility of process steps and responsibility/ownership • Visibility of process status / audit trail • Visibility of public spending investments / enhanced accountability • End-user service satisfaction • Availability of statistics for monitoring process execution and performance • Availability of information for decision-makers within PA
	Enhanced data protection & privacy	<ul style="list-style-type: none"> • Compliance with data protection regulations • End-user service satisfaction

Table 8 – Dimensions of impact in the PICTURE Impact Measurement Methodology

During the impact measurement process it is envisaged that measures should be given for the current situation, the targeted improvement (in the to-be situation) and the expected impact (which is based on the difference between the targeted improvement and the current situation). It should be noted, that the expected impact may be positive, indifferent or negative. The overall impact assessment (at this stage, human analysis of the results will be required) should be based on outweighing the positive and negative impact in the current and to-be situation.

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A “filled-in” example of the first indicator “execution time” is shown in table 9.

Dimension of impact	Targeted Impact Area	Performance Indicators	Current situation (without ICT or with baseline ICT)	Targeted Improvement (with new ICT)	Expected Impact
Time	Faster process	Execution time (minutes)	60 minutes to produce result	10 minutes to produce results	The expected time saved is expected to be 50 minutes, or 83% time saving

Table 9 – Measurement example for the indicator “Execution time”

Note that some indicators may be used to assess the impact in more than one impact areas. For example the indicator “Average time (number of hours/month) required to execute ICT supported tasks” is used to assess the impact area “Faster Processes” and “ICT operating personnel costs”.

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4 Future work

The next task is to design in detail the ICT Impact Measurement Methodology. The level of detail should be adequate in order to support the development of this methodology in the PICTURE Tool.

The design of the methodology will be based on the user and technical requirements identified in this report (D3.2) as well as relevant best practices identified in the state-of-art analysis (D3.1).

During the design phase, process attributes will be identified for all process building blocks (identified in WP1) based on the three impact dimensions (time, resources, quality) and indicative performance indicators identified in the previous section.

Another important consideration during the design phase is to ensure that performance indicators are measured according to a common scale of measurement for similar values. For example in order to measure the duration of time we may use both minutes as one dimension and months as the other, in order to derive the rate hour/month.

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Appendix 1 – Workshop data, Sample Questionnaire and Guidelines for workshops

A. Workshop logistic data

The three workshops took place in the following locations, dates and with the mentioned participants.

City of Amarooussion

Date of workshop: 7 December 2006

Location: City of Amarooussion (CoA)

Participants:

Name	Position	Organisation
ELENI MAGLARA	Head of European Projects Unit	CoA
CHRISTIANA ARMENIAKOU	Member of European Projects Unit	CoA
KOSTAS ZIRAS	Member of European Projects Unit	CoA
NIKOS PAPAIOANNOU	Head of IT department	CoA
MARIA DRAKOULA	Head of Quality Office	CoA
SOUMI PAPAPOULOU	Managing Consultant	PLANET

City of Turin

Date of workshop: 14 December 2006

Location: Turin

Participants:

Name	Position	Organisation
Franco Carcillo	Executive manager	City of Turin
Maria Sina	IT department's Manager	City of Turin
Mauro Correndo	IT department's Manager	City of Turin
Vera Regaldi	Process unit's manager	City of Turin
Giorgio Restano	ICT consultant	CSI Piemonte

City of Winterhur

Date of workshop: 11 December 2006

Location: COW

Participants:

Name	Position	Organisation
RUPRECHT WALTER	CIO	COW
EBERLE IVO	Stellvertreter CIO	COW

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ZECH CHRISTOPH	Projectmanager	COW
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B. Questionnaire and Guidelines

The following questionnaire and guidelines were distributed to the technical partners (CSI, IWI-HSG) and the three cities (CoA, CoT, CoW).

Purpose of this questionnaire

The purpose of this questionnaire is to collect Public Administrations' requirements for the PICTURE Impact Measurement Methodology.

Specifically, the questionnaire aims to identify the information needs of the City of Amaroussion, the City of Turin and the City of Winterthur, when it comes to ICT investment decisions. The key issue to be addressed is (a) what information is needed in order to enable rational decisions regarding a new ICT purchase?

The answers to such a question typically involve cost-benefit analysis regarding the impact of an ICT on Public Administration stakeholders (including PA executives, PA staff and end-users). From the perspective of PICTURE, the focus is on PA decision-makers / executives, in other words persons who have the authorization to decide on a new ICT investment.

The objectives of the Impact Measurement Methodology are as follows:

- To enable PA decision makers to map ICT functionality groups (e.g. document management, eSignature) to their processes (that have been modelled with process building blocks). I.e. the PA will be able to know which ICTs can support a specific process and in what way.
- To calculate the impact of ICTs on PA processes. The impact may be negative (e.g. high training cost) or positive (e.g. time savings) on the processes, and may be qualitative or quantitative in nature.
- To identify areas of possible process re-organisation through the introduction of ICTs (based on similar patterns of ICTs on process building blocks).

Having the above objectives in mind, the questionnaire in section 3 has been designed. The input received from this questionnaire is crucial in order to design an Impact Measurement Methodology that meets the actual needs of Public Administrations.

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Action Plan for workshops

The questionnaire should be completed by the City of Amarousson, the City of Turin and the City of Winterhur.

You will be supported in the process of completing the questionnaire by your local research partner as follows:

- COA - PLANET
- COT - CSI
- COW - IWI

Specifically, you will have the opportunity to discuss the questionnaire and complete it at a bilateral workshop with your research partner before the 10th of December.

Please invite at least 3 decision-makers from your Public Administration including at least one representative of the executive management (e.g. mayor, vice-mayor), the manager of the Organisation & Processes unit (or equivalent) and the IT department's manager to participate in the workshop.

Partner	Action	Deadline
IWI, CSI, (PLANET)	Inform PLANET on the date of the workshop (to be held before 10/12) and name & position of participants	5 December
PLANET & COA, IWI & COW, CSI & COT	Hold bilateral Workshops in order to collect feedback to questionnaire	By 10 December
IWI, CSI,	Send PLANET completed questionnaires	15 December
FILENET, IWI, CSI	Provide inputs for D3.2 (including workshop results and inputs from WP1 and WP2)	15 December
PLANET	Develop stable version of D3.2	15 January

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Questionnaire for workshop

1. Workshop Data

Date of workshop:

Location:

Participants:

Name	Position	Organisation

2. Current ICT environment

2.1 What was the average level of ICT investment during the last 5 years in your organisation?

Year	Total ICT investment (Euro)	ICTs purchased
2002		e.g. document management system, portal etc.
2003		
2004		
2005		
2006		

2.2 Which organisational unit(s) is/are responsible for planning ICT investments?
(multiple answers possible, indicate: *applies*)

Central IT-department (for the whole administration)	
Hierarchical Level 1 (e.g. mayor)	(please specify)
Hierarchical Level 2 (e.g. Department)	(please specify)
Hierarchical Level 3 (e.g. Bureau)	(please specify)
Hierarchical Level 4 (e.g. office)	(please specify)
Other	(please specify)

2.3 Please describe the procedure/process for taking a decision on a new ICT investment
(for example, IT department drafts proposal, proposal is reviewed by Mayor and vice-Mayor, comments are integrated in final proposal, IT department implements decision)

Answer:

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2.4 How would you describe your current ICT infrastructure? (indicate: applies)

Our specialized ICT procedures are detached from each other and are not integrated	
Our specialized ICT procedures are coupled with each other at reasonable places by interfaces (n-to-m-integration)	
Our specialized procedures are coupled with one another by an integration layer (e.g. workflow management system or enterprise application integration) (1-to-m-integration)	

2.5 What ICTs are currently in operation in your organisation? (multiple answers possible. Indicate: yes)

document management system (DMS)	
workflow management system (WFMS)	
business process management (BPM)	
eMail management	
records management	
electronic register	
digital archive / electronic archive system	
scanning / imaging / digitization / capture	
(web) content management System ((W)CMS)	
forms management / form server	
virtual post office	
digital signature	
electronic payment procedures	
e-Procurement	
"Packaged ERP for Government"	
Geo Information System (GIS)	
Human resources (HR) system	
data warehouse	
Other	(please specify)_

3. ICT investment needs

3.1 For what reasons do you believe it is important / necessary to invest in new ICTs? (indicate: applies)

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law changes	
suggestion of co-workers	
profitability / cost reductions	
existing ICT systems no longer correspond to the requirements	
Improvement and re-organisation of business processes	
cross-linking with other administrations	
intercommunal competition	
adaptation of legacy systems	
Other	(please specify)

3.2 What factors inhibit / restrain ICT investments?

budget restrictions	
complexity of the endeavour	
missing internal know-how	
missing standards regarding new systems	
difficult integration of legacy systems	
missing willingness to change	
security aspects / data protection	
Other	(please specify)

3.3 Does your organisation have an ICT investment strategy ?

Answer:

3.4 If not, which of the following reasons may apply? (indicate: applies)

No need	
missing commitment	
missing resources	
missing enforceability	
missing know-how	
Too short innovation cycles in IT	
unclear use	

3.5 Which of the following ICTs does your organisation plan to introduce in the next 3 years? (multiple answers possible. Indicate: yes)

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document management system (DMS)	
workflow management system (WFMS)	
business process management (BPM)	
eMail management	
records management	
electronic register	
digital archive / electronic archive system	
scanning / imaging / digitization / capture	
(web) content management System ((W)CMS)	
forms management / form server	
virtual post office	
digital signature	
electronic payment procedures	
e-Procurement	
"Packaged ERP for Government"	
Geo Information System (GIS)	
Human resources (HR) system	
data warehouse	
Other	(please specify)_

3.6 If applicable, what is the level of ICT investment foreseen in the next 3 years?

Year	Total ICT foreseen investment (Euro)
2007	
2008	
2009	

3.7 How do decision-makers currently assess the impact of new ICTs on your organisation?

(indicate: applies)

By using an established ICT impact measurement methodology	(please specify the name of the methodology and describe briefly the measurement process)
By using a method developed by the	

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organisation itself	(please describe briefly the measurement process)
By other forms of assessment	(please describe briefly)
No assessment is performed	(indicate reasons)

IMPORTANT NOTE FOR WORKSHOP: *The following 4 questions are the main focus of the workshop, please discuss and analyse in-depth, discussing further (unstructured) issues/ questions if necessary.*

3.8 What information do you believe the PICTURE tool should provide you regarding the impact of ICTs on your organisation's processes?

3.9 During the workshop, try to identify together with your research partner a list of performance measures / performance indicators in order to retrieve this information (e.g. duration in minutes of X etc.)

3.10 What source of information is required in order to obtain data for the performance measure?

Please use this table in order to present the answers to 3.6 and 3.7
(note: it may be easier to fill in the table by having a specific process in mind at a time. If so, please specify the process and copy the table each time)

Process in mind: (specify process if applicable or mention "no specific process in mind")		
Information we need from PICTURE regarding impact of ICTs on process	Performance measures / indicators	Source of information / information "owner"
<i>e.g. how a given ICT will reduce errors in data entry of application forms</i>	<i>Number of errors reduced</i>	<i>Database with application forms</i>

3.11 Consider your organisation wants to invest in eSignature. What information should be provided by

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the PICTURE tool regarding the impact of eSignature on your processes? *(please describe in detail what information you need and suggest relevant measures)*

Information on time savings (through eSignature)	
Information on cost savings (e.g. paper handling costs)	
Information on errors eliminated / reduced	
Information on the number of manual steps that are eliminated (by implementing eSignature)	
Information on number of media breaks reduced	
Recommendations for restructuring the processes affected	
Other	(please specify)

4. Current process landscape

4.1 Are your organisation's processes modelled or recorded in any form?

(please describe the modelling method used, e.g. EPC, ADONIS, UML, Flowcharts, text description in word, Visio etc.)

Answer:

4.2 Which of your processes are currently supported by ICTs?

(please mention the name of the processes and the name of the supporting ICTs)

Answer:

4.3 Do you currently measure the performance of your processes ?

Answer:

4.4 If so, how do you currently measure the performance of your processes? If you use a performance measurement method, please specify which one (e.g. balanced scorecard, WiBe, EFQM)

Answer:

5. Re-organisation needs

5.1 What are the main issues that require process improvement in your organisation?

(e.g. elimination of manual steps, reduction of errors, improvements in time etc.)

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5.2 What information do you expect/need from PICTURE regarding the potential of ICTs on process re-organisation?