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Evaluation Results Report & Evaluation Summary Report

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1 Evaluation summary

This deliverable presents the final results of the evaluation of the PICTURE methodology and tool. It is a combined deliverable comprising D6.9 "Completion of Evaluation Results Report" and D6.10 "Evaluation Summary Report". It presents the results from the first and the second evaluation round as well as the conclusions drawn.

To summarise the PICTURE evaluation we would like to stress three key aspects:

A general idea of PICTURE

A variety of information need has been identified in all cities. On the other hand, the municipalities have independence in making investment decisions limited by internal regulations. Clearly defined benefits are expected by cities from the particular ICT tool which will be used. So, PICTURE and its impact measurement methodology is perceived as one of helpful and supporting tools in making investment decisions.

A way of PICTURE's idea realisation

Every municipality has processes modelling and analyzing needs. They assume that an appropriate tool supporting these activities is needed. Process modelling methodology is widely accepted and the evaluation has proven that process building blocks are an appropriate way of modelling processes in public administrations. The PICTURE tool developed in work package 5 served as a prototype for verification of the PICTURE methodology. The evaluation of the prototype has shown that – due to its prototypical character – it has shortcomings in the user interface and should be improved for productization. This will be addressed in future exploitation activities by the partners (e.g. the ERCIS spin-off).

A willingness of PICTURE's practical use

Officers have declared their readiness to use PICTURE at their positions in municipalities, but under some important conditions. Potential problems regarding future PICTURE usage were noticed by the officers as well. PICTURE is perceived however as a useful tool with great chance of becoming a standard to support process modelling and analysing in European PAs.

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2 A methodological background of PICTURE evaluation and criteria of success

Assuming that our evaluation at this stage of the project has a prospective character, we were able to collect only the first impressions of potential users. Thus our evaluation was concentrated mainly on human aspects of using the tool.

The role of human aspects is undoubtedly crucial in creating any information system value.

The importance of human aspects in evaluation of information systems was mentioned by the co-author of this report – Marian Niedźwiedziński many years ago. In his book “Evaluation of ICT investment projects” published in 1989 he stressed that a management information system (MIS) is the better, the bigger its performance expectancy is and simultaneously the less effort expectancy is connected with it. It is illustrated by the following diagram (see fig. 1).

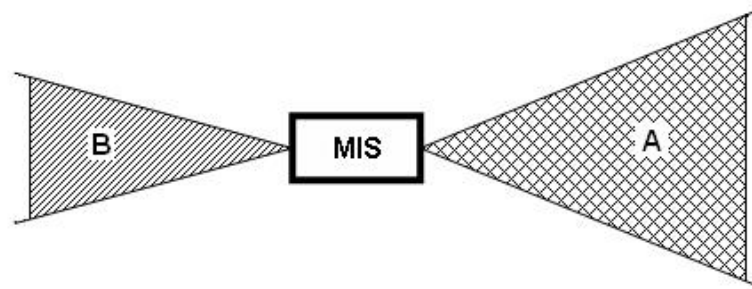


Figure 1: A graphical interpretation of factors determining users' acceptance of MIS

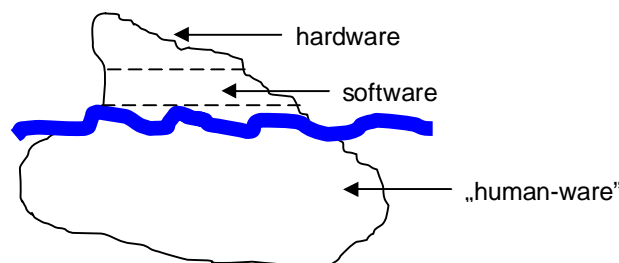
Source: Marian Niedźwiedziński “Evaluation of ICT investments' projects in an organization”, Polish Economic Publishing House, Warsaw, 1989 p.102

A surface of the triangle A symbolizes the scale of performance expectancy connected with a system. A surface of the triangle B symbolizes the scale of expected efforts connected with the system. The relation A/B expresses the attractiveness of the system for users and the same – its usage value.

Although a large progress has been made in the subject since 1989, it still seems to be worth mentioning. It is obvious, that user acceptance problem was visible even such a long time ago and even in the country (Poland), which was then not very much advanced in using computer information systems.

At ECIS'07 (European Conference on Information Systems, <http://www.ecis.org>) an interesting opinion was presented, namely that ICT applications' value depends on the three elements: hardware, software and “human-ware”. From their importance and visualization points of views – the iceberg analogy can be applied (see fig. 2 below). Similarly, as in the case of iceberg, in case of ICT applications' value - it is easily visible that hardware and software is not dominating. The most important factor is “under water's surface”.

Figure 2: Iceberg analogy



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The “human-ware” means users’ readiness to transfer potential value of ICT applications into real effects for their organizations. Such a readiness can have many “degrees”. Up to the degree of such a readiness – an adequate degree of an application’s effectiveness for an organization can be achieved.

It is necessary to stress, that no benefits can be achieved just by system’s application itself. What is always needed is a positive approach of its users, who can make the application workable and effective. So, we have elaborated the following list of success criteria applicable for the PICTURE:

1. perceived usefulness of a general methodological approach – its ability to facilitate and improve the process of building ICT strategy within PAs.
2. perceived usefulness of process modelling approach – how much the registration of processes and their analysis is needed within PAs.
3. perceived usefulness and ease of use of the modelling procedure
4. perceived usefulness and ease of use of the impact measurement procedure
5. willingness of potential users to use PICTURE, based on their feelings, fears and general intentions
6. perceived usefulness of PICTURE practical results from 2 points of view:
 - a. their value for a final decision process (concerning ICT investments)
 - b. their ability to be in a continuous usage.

All criteria are treated as fulfilled when most of declared numbers (in questionnaire) and answers (in focus) are positive.

2.1 Evaluation method

Preparing an adequate and the most suitable evaluation method for PICTURE, we have based our findings on the article of Venkatesh et al. mentioned above and other current approaches to estimation of ICT users’ acceptance presented by Yogesh Malhotra & Dennis F. Galletta. The essence of their idea is illustrated in the figure 3.

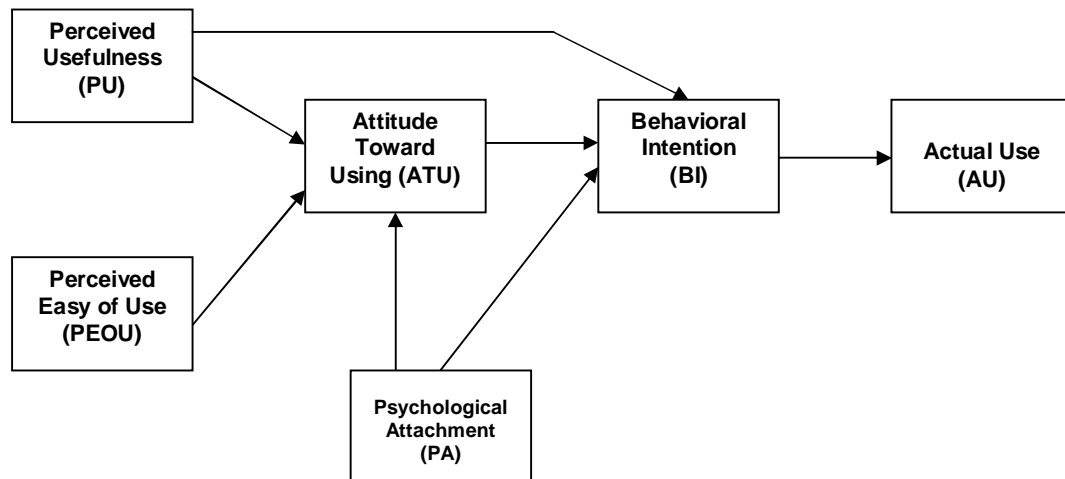


Figure 3: Research model: TAM Extended to Account for Social Influences

Source: Yogesh Malhotra, Dennis F. Galletta (1999), Extending the Technology Acceptance Model to Account for Social Influence: Theoretical Bases and Empirical Validation

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The authors came to the common conclusion: to build a full picture of user's acceptance – it is necessary to take into consideration the most important factors mentioned below:

Perceived usefulness (PU) is defined as the degree to which a person believes that using a particular system would enhance his or her job performance. In case of the PICTURE perceived usefulness means perceived usefulness of a general methodological approach – its ability to facilitate and improve the process of building an ICT strategy within PAs.¹

Perceived ease of use (PEOU) is defined as the degree to which a person believes that using a particular system (in the case - the PICTURE) would be free of effort.²

Attitude toward using (ATU) is defined as the individual user's positive or negative feelings (evaluative affect) about performing the target behaviour.³

Behavioural Intentions (BI) is the measure of the strength of one's intention to perform a specified behaviour.⁴

Psychological attachment (PA) is defined as the degree of commitment of the IS user toward system use (in the case - the PICTURE), based on the effect of social influences on his or her behaviour.⁵

Kelman⁶ defined three processes that affect individual behaviour: compliance, identification, and internalization.

Compliance: when an individual adopts the induced behaviour not because she believes in its content but with the expectation of gaining rewards or avoiding punishments.

Identification: when an individual accepts influence because she wants to establish or maintain a satisfying self-defining relationship to another person or group.

Internalization: when an individual accepts influence because it is congruent with her value system.

Three aspects lastly mentioned in the text (Attitude toward using, Behavioural Intentions and Psychological attachment) put together Social aspects.

Actual use (AU) is measured in terms of frequency of system use ('how often') and the volume of system use ('how much') by the user.

Taking into consideration that at this stage of the project it is impossible to examine "actual use", we have decided to eliminate this factor from our analysis.

For the evaluation we have adequately adopted and extended a questionnaire proposed by

¹ Yogesh Malhotra, Dennis F. Galletta (1999), Extending the Technology Acceptance Model to Account for Social Influence: Theoretical Bases and Empirical Validation, p. 320

² Yogesh Malhotra, op. cit. p. 320

³ Kelman, H. C. "Compliance, Identification, and Internalization: Three Processes of Attitude Change?," Journal of Conflict Resolution, 2, 1958, p. 216.

⁴ Kelman, H. C. p.288

⁵ Yogesh Malhotra, op. cit. p. 6

⁶ Kelman, H. C. op. cit. pp. 51-60.

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Yogesh Malhotra & Dennis F. Galletta in their paper mentioned above. Details concerning the questionnaire were presented in D 6.2.

Results achieved in the first stage of the evaluation were presented in IR6.4 – IR6.8. By the way of this stage we have collected numerous remarks divided into two lists: additional functionalities required and improvement proposals (see IR6.4 – IR6.8). Both lists were used for the tool improvements by work package 5, which is responsible for the prototype.

So, in the beginning we have concentrated on evaluating technical aspects and the usability of the tool. This was done with the adopted TAM based questionnaire (mentioned above). After the first evaluation stage we realized however, that we also need some more evaluation on the complete methodology as implemented in the tool and its application in public administrations. As this was not covered by our questionnaire we introduced focus questions in the second evaluation stage.

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3 Stages of evaluation

3.1 Questionnaire

3.1.1 Introduction

There are 4 groups of answers' assessments:

- Very likely (7 or 6 points)
- Likely (5 or 4 points)
- Unlikely (3 or 2 points)
- Very unlikely (1 point).

The shape of the questionnaire is shown below:

Question	Very likely		Likely		Unlikely		Very unlikely
Question 1	7	6	5	4	3	2	1
Question 2	7	6	5	4	3	2	1
...	7	6	5	4	3	2	1
Question n	7	6	5	4	3	2	1

The mean value was calculated according to each answer and each city (Poland – CoL, Switzerland – CoW, Greece – CoA, Italy – CoT, Germany –CoM)

There were 3 groups of research goals:

1. Perceived usefulness.
2. Perceived easy of use
3. Social aspects

For each group we have selected the most characteristic list of questions (see in tables below).

Red lines and green lines (equal to 3,5 points) on the charts mean the Acceptance Level up to the questions' character (positive or negative attributes).

For positive attributes:

The answers above green line mean an acceptance of PICTURE from particular aspects' point of view.

Therefore the answers below green line mean lack of an acceptance.

For negative attributes:

The answers below red line mean an acceptance of PICTURE from particular aspects' point of view.

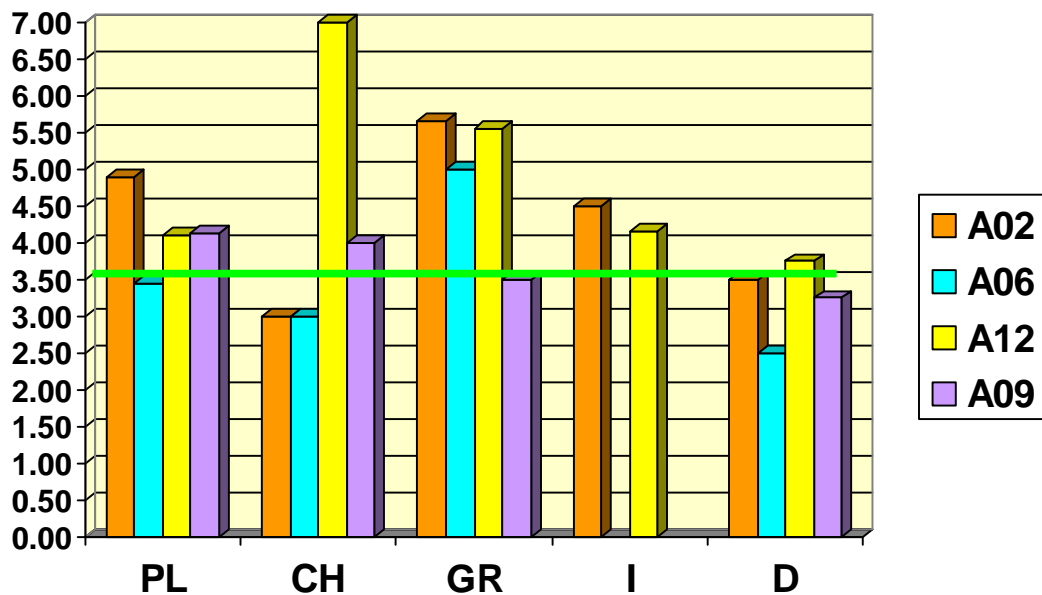
Therefore the answers above red line mean lack of acceptance.

3.1.2 Perceived usefulness

Perceived usefulness includes:

- perceived usefulness of a general methodological approach,
- perceived usefulness of modelling approach,
- perceived usefulness of impact measurement procedure,
- perceived ease of use.

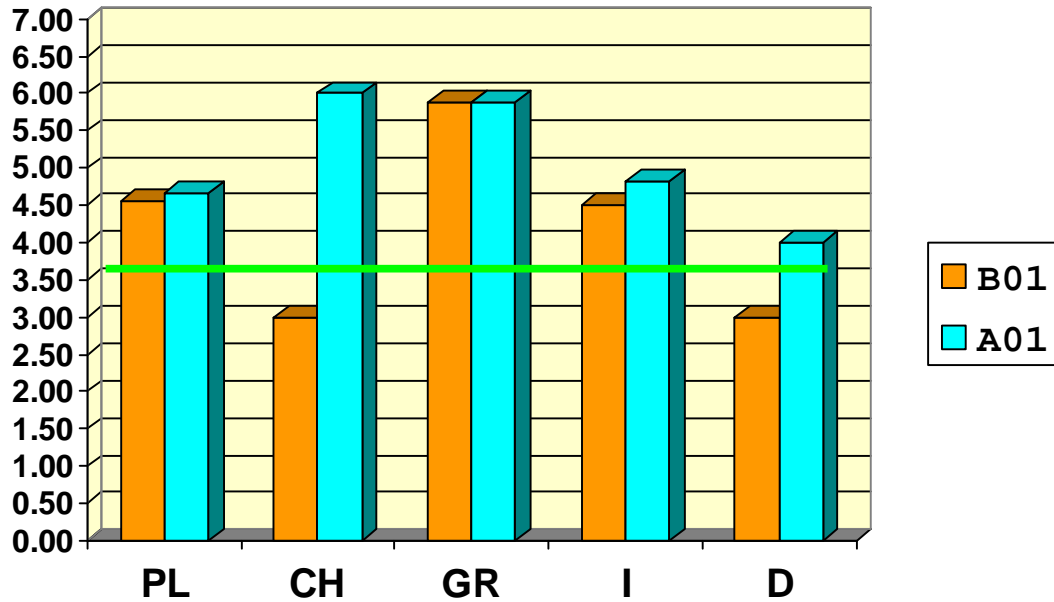
Perceived usefulness of a general methodological approach						
Id	Question	PL	CH	GR	I	D
A02	Using the PICTURE-tool would assist disclosing potential defectiveness of processes in the PA eg. operation doubling, needless information channels (dead-end streets), delays in realization of function, defective realization of function, excessive overload of work position (bottle-neck)	4,89	3,00	5,67	4,50	3,50
A06	I intend to use PICTURE-tool for planning reorganization of my administrative unit.	3,44	3,00	5,00	n/a	2,50
A12	The reason I prefer use of PICTURE-tool is because of the underlying organizational values.	4,11	7,00	5,56	4,17	3,75
A09	I intend to use PICTURE-tool to improve my knowledge about ICT components, which could facilitate administrative processes within my field of interest.	4,13	4,00	3,50	n/a	3,25



The majority of the countries noticed positive perceived of general methodological approach.

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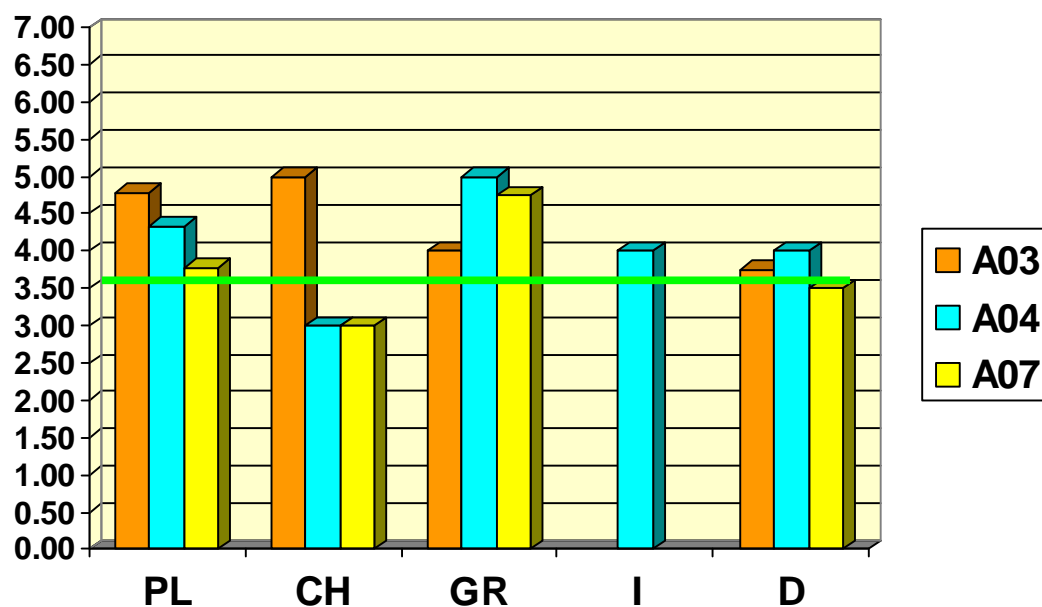
Perceived usefulness of modelling approach						
Id	Question	PL	CH	GR	I	D
B01	Using the PICTURE-tool would assist register processes in the PA in modern, standard, univocal and coherent form.	4,56	3,00	5,89	4,50	3,00
A01	Using the PICTURE-tool would assist modelling of PA processes.	4,67	6,00	5,89	4,83	4,00



Each country noticed that the PICTURE would support modelling processes.

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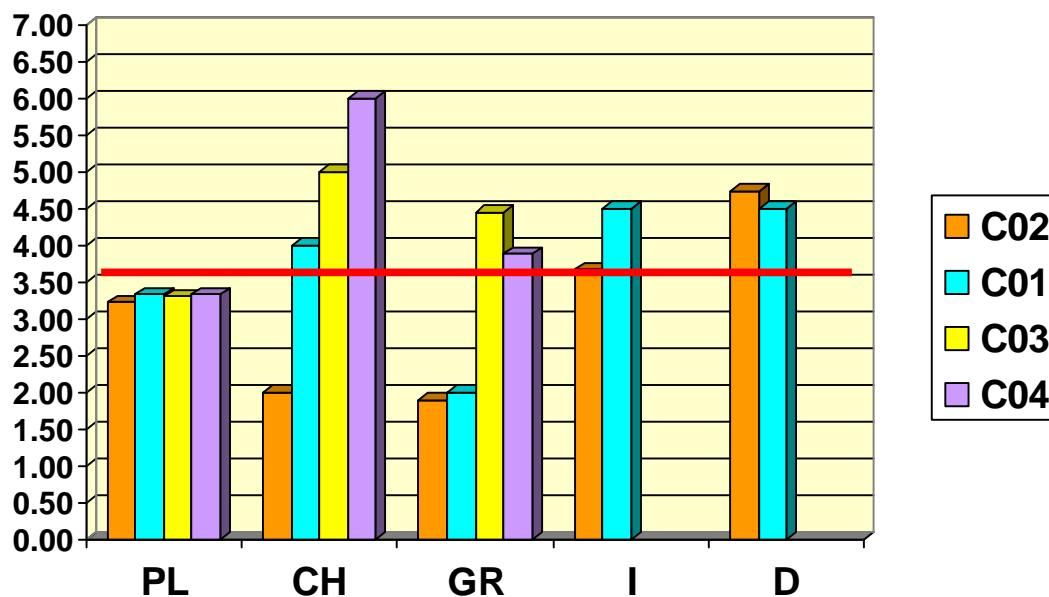
Perceived usefulness of impact measurement procedure						
Id	Question	PL	CH	GR	I	D
A03	Using the PICTURE-tool would enable the measurement of the impact of introducing new ICTs in the PA.	4,78	5,00	4,00	n/a	3,75
A04	Using the PICTURE-tool would support the derivation of ICT investment decisions.	4,33	3,00	5,00	4,00	4,00
A07	I intend to use PICTURE-tool for better understanding of possible effects due to specific ICT investments.	3,78	3,00	4,75	n/a	3,50



Each country noticed that the PICTURE impact measurement would support investment decision. Switzerland noticed that the PICTURE tool can help them in measuring impact of ICT on the PAs but it saw only limited influence of the tool results on the way how investment decisions are made.

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Perceived ease of use						
Id	Question	PL	CH	GR	I	D
C02	I feel apprehensive about using PICTURE-tool.	3,22	2,00	1,89	3,67	4,75
C01	Using PICTURE-tool is frustrating for me.	3,33	4,00	2,00	4,50	4,50
C03	It scares me to think that I could lose a lot of information using PICTURE-tool by hitting the wrong key.	3,3	5,00	4,44	n/a	n/a
C04	I hesitate to use PICTURE-tool for fear of making mistakes I cannot correct.	3,33	6,00	3,88	n/a	n/a



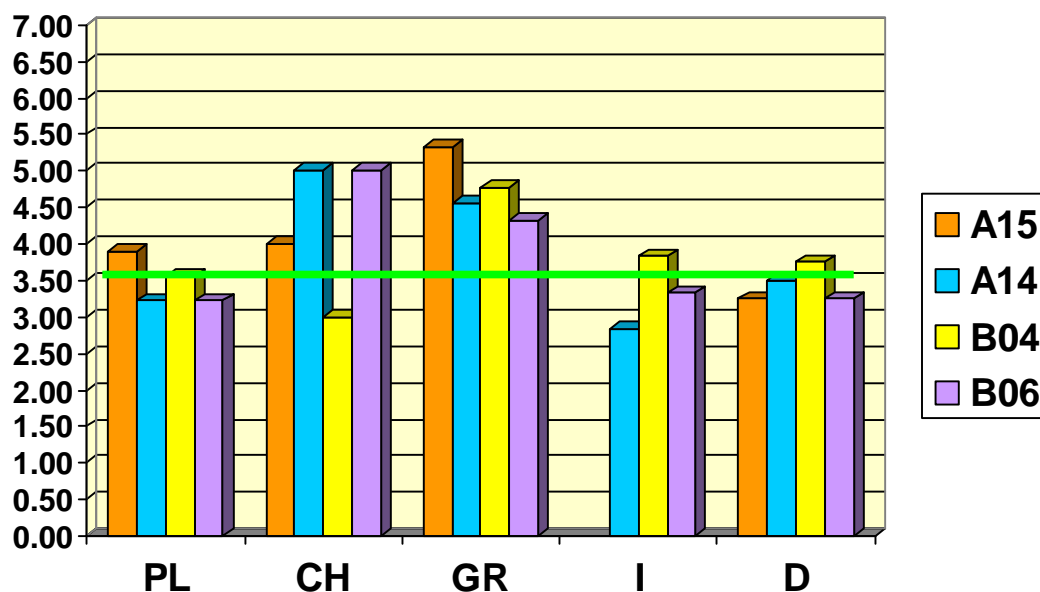
Majority of the countries don't perceive PICTURE as an easy tool to use. To address this we have not only collected the questionnaires with the rating but also comprehensive lists with requests for additional functionalities and suggestions for improvements. These requests are documented in IR6.4 to IR6.8 and have been used as basis for tool improvements made by work package 5.

3.1.3 Social aspects

Social aspects include:

- positive feelings about PICTURE,
- negative feelings about PICTURE,
- fears of using PICTURE.

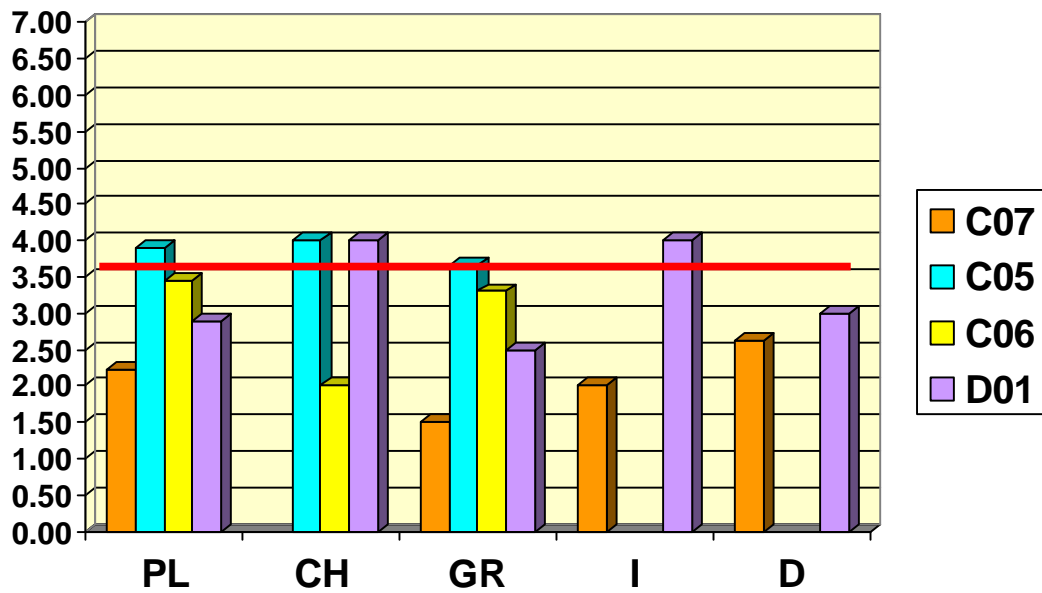
Positive feelings about PICTURE						
Id	Question	PL	CH	GR	I	D
A15	I can recommend the PICTURE-tool to other potential users.	3,89	4,00	5,33	n/a	3,25
A14	I talk up the use of PICTURE-tool to my colleagues as a great use.	3,22	5,00	4,56	2,83	3,50
B04	PICTURE-tool makes my work more interesting.	3,56	3,00	4,78	3,83	3,75
B06	I am proud about using PICTURE-tool.	3,22	5,00	4,33	3,33	3,25



Only Switzerland and Greece consequently positively accepted possibility of use the PICTURE tool.

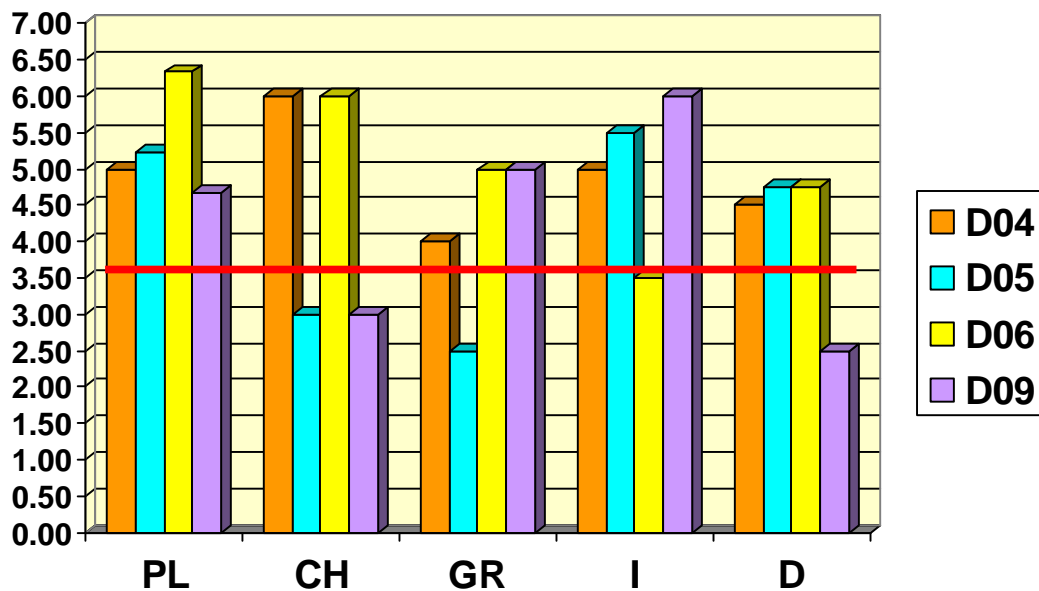
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Negative feelings about PICTURE						
Id	Question	PL	CH	GR	I	D
C07	My private views about use of PICTURE-tool are different than those I express publicly.	2,22	n/a	1,5	2,00	2,63
C05	I get bored quickly when using PICTURE-tool.	3,89	4,00	3,67	n/a	n/a
C06	Using PICTURE-tool is somewhat intimidating to me.	3,44	2,00	3,30	n/a	n/a
D01	Unless I'm rewarded for using PICTURE-tool in some way, I see no reason to spend extra effort in using it.	2,89	4,00	2,50	4,00	3,00



None of the countries have noticed any psychological barriers of PICTURE usage.

Fears of using PICTURE						
Id	Question	PL	CH	GR	I	D
D04	I am afraid that willingness and enthusiasm of the organization to undertake the PICTURE's activities is not big enough.	5,00	6,00	4,00	5,00	4,50
D05	I am afraid that readiness (within PA's management) to take responsibility for the PICTURE's activities from start to finish is not big enough.	5,22	3,00	2,50	5,50	4,75
D06	I am afraid that the PICTURE's activities will require appropriate resources both human and financial, which can be a problem.	6,33	6,00	5,00	3,50	4,75
D09	As so numerous ICT applications are obligatory within the PA, I am afraid that a field of possible PICTURE's usage is very limited.	4,67	3,00	5,00	6,00	2,50



All countries noticed many problems (financial, organizational, legal, human) connected with future PICTURE usage. The PICTURE consortium is aware of this problem. Thus, work package 4 has also developed a PICTURE application methodology (covering e.g. change management considerations and management awareness) which guides PAs in actually applying the PICTURE approach. The methodology is documented in deliverable D4.7. Additionally, consortium partners will consider the comments during future exploitation activities.

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3.2 Focus Questions

3.2.1 Introduction

The target group of survey were PA's officers in five countries: Greece, Germany, Poland, Switzerland and Italy. The goal of analysis was gaining opinion about information needs of PA's departments in the field of processes modelling, IT decisions and evaluation in that context of processes modelling methodology and impact measurement offered by PICTURE project.

Analysis has a supporting role to results of quantity analysis made at first stage of evaluation of PICTURE project. The analysis has had following goals:

1. Evaluation of information needs in the field of ICT in PA.
2. Evaluation of process modelling needs.
3. Evaluation of PICTURE modelling methodology.
4. Evaluation of impact measurement methodology.
5. Evaluation of readiness to use of PICTURE.
6. Evaluation of practical results of PICTURE usage.

For achieving those goals a focus analysis was taken on a group of 8-10 people. This kind of analysis is made by free, moderated discussion according to previously written scenario. The scenario is general and consists of only problematic questions, which have to be discussed while meeting. The talk is an easy exchange of opinions between participants (and moderator), sometimes moving to heated discussion. The important thing is that every participant has free opportunity to present his own opinions regardless the opinions of others.

To facilitate the focus questions, we have elaborated for each of 6 goals (mentioned above) a list of supporting questions (see annex 7.1). The questions were used by moderators to lead the discussion accordingly with the focus goals. The supporting questions were in many cases similar to the questions included into our questionnaire used at the first stage of the evaluation.

Survey participants (PA's officers) were divided into five groups (based on five cities participating in the project). Survey has been done between 20.11.-11.12.2008 in the following cities: Amaroussion, Winterthur, Lodz, Torino, Münster.

In each city, the survey was done by the same general schema and moderated by a member of PICTURE consortium.

Survey's participants answers were recorded by observers and based on their records or scripts, project partners prepared a report summarizing their local conclusions. ZIE as a leading partner in the evaluation was responsible for preparing a consolidated version of total focus results.

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3.2.2 Evaluation of information needs in the field of ICT in PA

All answers from particular cities concerning information needs are presented in the table below.

CITY	Evaluation of information needs in the field of ICT in PA
Lodz	<ul style="list-style-type: none"> • Kinds of needed information: cost, effects and results, possibilities of education and deployment, compatibility with other systems, technical aspects. • Decision process is initiated by essential employee, which signals an idea or a specific need. Next, his chief is doing a market research and gives proposal to director. Director is verifying the proposal and signs it together with financial director. The final decision is taken by city president. • Organization unit has independence in making decisions on IT. • Expected system's implementation benefits: costs reduction, upgrading the quality of information time savings.
Amaroussion	<ul style="list-style-type: none"> • Key information required is the type of needs that other organisation units have, the specifications of potential products for purchase and the available budget. • Other organisational units send their requests/needs for ICT to DETDA, which in turn prepares a proposal for an ICT investment. If the foreseen cost of ICT is under 10,000 €, DETDA takes the final decision on its own (usually by direct appointment to a supplier or invitation of bids to a few suppliers from a predefined shortlist). In some cases, DETDA also develops software in-house (e.g. for specialised software). If the foreseen cost is over 10,000€ the investment decision is taken by a committee that oversees a required tender process. • DETDA has independence as mentioned above for small ICT investments (under 10,000€)
Winterthur	<ul style="list-style-type: none"> • The required information is benefits, costs (investment and operating costs), interoperability/integration in existing application landscape, credibility of ICT supplier, impact on organisational needs (process support), learning efforts. • Responsibility for decision depends on expected investment. Typically the decision process starts with a request from business units, specification of requirements, evaluation of potential alternatives. Decision, all activities are performed cooperatively (business unit and IT department). • We have has independence for basic infrastructure investments which are defined in the service agreement of the IT department. • Expected system's implementation benefits: financial and operating impacts (according to the expectations).
Münster	<ul style="list-style-type: none"> • The question about information needs in the field of ICT could not be answered generally. The required information depends on the scope of the investment and whether it is a reinvestment of old hardware or software or whether it is a new investment resulting in organisational changes. The employees need information on technical aspects, costs, profitability, amortisation, utility analysis, legal issues, and hardware requirements. • The ways of making a decision depend on the amount of the investment because different boards have to be involved. Within the organisation the plan is checked concerning technical and economic issues. Afterwards it is passed on along the hierarchy. • There is some independence in making decisions but it depends on the amount of the investment. • The participants expect the quality of work to be improved and the processes to be accelerated. Furthermore ICT investments should provide economic benefit.

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Turin	<ul style="list-style-type: none"> • Required information to deal with when planning investments on ICT are: <ul style="list-style-type: none"> ○ individualizing which processes, services, tasks need improvements mainly, both from a qualitative point of view (permitting to manage same tasks in a more efficient way and providing satisfaction in users) and from a time and consumable resources saving point of view. ○ on the basis of identified processes in the previous step, involved departments and offices, we evaluate which ICT components could be necessary to improve processes. Naturally, we should find out ICT components that already are into the organization or in specific offices which allow to reduce to the minimum investments in new components. ○ Finally we need to know which are the solutions available on the ICT market that could satisfy our needs. We have to evaluate their level of compatibility with existing components and then the rate between their cost and the possible benefits coming from their use. • Our organization unit is in charge of evaluating the type of needed investments in ICT on behalf of all Municipality's departments. Having a single point of decision permits to centralize the choice on which ICT components to invest on based on the needs described by several offices at once. As a consequence it is possible to realize a more effective investment plan. Besides it permits of course to gain homogeneity in the solutions provided. • This department is quite independent in the decision about ICT investment. Nevertheless the final solutions are identified according to the responsible of the involved office, mainly when the requirements are linked with specific rules of law. In fact in this case the departments' responsible, who are the domain experts, must validate the solutions according to the legal constraints. • The benefits expected by an ICT investment are: cost cut thanks to a reduction of consumable resource use, time saving in closing a process, optimisation of the work done by public servants, better quality of the outputs of a process, higher service quality as perceived by the end users, good integration with existing components, to conform a process to new rules of law.
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Focus attendants in every city found out that taking investment decision needs wide variety of information that includes: costs of implementation, expected benefits, option of integration with existing systems in unit, supporting processes in unit, technical support and trainings.

Decision process is different in particular cities. In most common situations before investment decision stands the needs of unit. Units have free opportunity for making decisions but in strict range. Officers are looking forward for benefits brought by implementation of system, such as: lower costs, time savings and upgrading of quality of work in unit.

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3.2.3 Evaluation of processes modelling needs

All answers from particular cities concerning process modelling are presented in the table below.

CITY	Evaluation of processes modelling needs
Lodz	<ul style="list-style-type: none"> All of the tasks are described on the paper. There exists the need of mapping processes. Process updating results from organization rules. Process modelling would disclose defectiveness in PA unit.
Amaroussion	<ul style="list-style-type: none"> All key processes are modelled for the organisation according to ISO requirements, with the use of flowcharts. When a change occurs in a process there is a process for updating the modelled processes. Process modelling would assist in identifying weaknesses and improving processes.
Winterthur	<ul style="list-style-type: none"> The tasks are described in a job description. There exists the need of mapping processes for core business processes. Process descriptions are updated when necessary (projects, significant change of tasks). Process modelling may help in anomalies detection in PA unit.
Münster	<ul style="list-style-type: none"> The tasks of the participants are not described. They stick to defined competencies. In general a complex description of procedures at all positions would be helpful and desirable to make processes clearer. Especially for organisation units with regular processes and for introducing new employees this would make sense. However, it is not needed everywhere in the organisation. According to the participants of the workshop there is no process of updating description of procedures. The participants agreed that process modelling is useful for detecting weaknesses.
Turin	<ul style="list-style-type: none"> The description of the processes is currently based on a simple textual description of the steps needed to complete the process, of the ICT components in use and those available but not used, of the time needed to complete the whole process and the specific problems or critical issues occurring during the process. The more the description is detailed the better is the analysis done. Nevertheless a detailed description has not to be complex, on the contrary it is important to describe in an easy way each step in order to make easier to find a solution to a possible weakness and to understand which are the consequences of introducing a new ICT component. Today we haven't yet the need to update the description of a procedure, but on the other hand we have the need to formalize new descriptions of processes and eventually to integrate them with the existing ones. It is not so important to use a process modelling, but to extend the number of modelled processes inside the Municipality's departments, instead, in order to cover as many processes is possible. Their modelling becomes important only in a second phase when their formalization permits to describe them with a unified language and structure. This is obvious of course if the modelling is done by the use of a specific software. In this case it could be useful to have the possibility to export the modelling in a standard format, in order, for example, to import it in another system.

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In every unit a description of tasks of particular position is required and depending on city, this description is realized by text or flowcharts. In case of changes in realization of existing processes their descriptions are updated. Officers found out that process modelling may help in detection of weaknesses and upgrade them.

In one city survey participant assumed that they have the need of formalize new description of processes. The modelling functionality for them is not the primary case but they are expecting a tool that would have a feature of processes descriptions export to other standard formats and interoperability with other systems.

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3.2.4 Evaluation of PICTURE modelling methodology

All answers from particular cities concerning evaluation of methodology are presented in the table below.

CITY	Evaluation of PICTURE modelling methodology
Lodz	<ul style="list-style-type: none"> • There exists danger that the list of PBB couldn't be used in all of the situations in PA unit. The methodology is rather complex. Advantages: ability to assign a task to a person, transferring objects and their properties to different tasks. Disadvantages: ambiguous names of PBBs, no feature of copying modelled process' parts. • It was not difficult to use PICTURE, however it required quite a lot of time (e.g. to model many processes). • The clerks' education is required; the interface is not quite friendly user. • PICTURE seems to be similar to ARIS and Visio tools, however offers additional information and impact measurement. • Other benefits: growing of clerks responsibility and competencies, quality and in-time decisions.
Amaroussion	<ul style="list-style-type: none"> • A key advantage is the ability to have an overview and "control" of all processes in the organisation. Disadvantages are the lack of flexibility in some aspects of the tool such as not being able to move/ re-organise already modelled steps within a process (need to remodel the process from start), not easy to model very complex processes that have many sub-processes and loops (e.g. the tool currently assumes that each sub-process has one owner/initiator, but in some cases the owner is a committee of 3 persons. Also, Tool assumes that process starts from one step, but sometimes many independent sub-processes meet at one point at a later stage). • It was not difficult to use PICTURE, however it required quite a lot of time (e.g. to model many processes). User interface could be further improved, for example by using more well-known symbols (e.g. diamond for if/or). Other useful functionalities are export to Visio or bitmap and printing options for modelled processes • More interactive process flow would be useful (helping you to navigate through the tool in each step). • PICTURE seems to be similar to Visio, flowcharts. However, these cannot be directly compared to PICTURE which offers more such as information on attributes and impact measurement. • Other benefits: to re-organise and improve processes by identifying problems/weaknesses e.g. duplication of steps.
Winterthur	<ul style="list-style-type: none"> • Advantages of this methodology: transparency (responsibilities, documentation, performance, etc.); disadvantages: efforts for modelling and updating. • The question concerning operating of PICTURE is not relevant for us as, we do not operate the tool, yet; learning to use the modelling component is easy.; learning to use the impact analysis component is challenging → a method expert should be responsible for that. • A graphical differentiation between different task types (e.g. decision, communication, beginning/end) could improve intuitiveness. • The visibility/transparency of process presentation could be improved (integration of process parts in the whole process, integration of a process in the process landscape). • PICTURE is unique. • Other benefits: see advantages (transparency).

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Münster	<ul style="list-style-type: none"> • Advantages of process modelling are the integration of a lot of information which can be linked. Furthermore creating models as well as interpreting the models is rather easy. However, there is a certain effort for maintaining the models, which will only be made if the respective benefit is recognised. • The PICTURE tool was seen as rather complicated and little intuitive. It was regarded as a problem that by using a web application you cannot open several windows or views at once and therefore orientation is difficult. • There are no graphic symbols in the PICTURE tool. This also contributes to the lack of intuitive comprehensiveness. • The access to the processes was not regarded as easily understandable. The user has to click on several links and buttons which he would not expect. Therefore great effort is required to reach the desired position in the tool. • Other modelling tools the participants mentioned were ARIS and MS Visio. Although these tools could not be compared directly to PICTURE you can still find some general similarities between PICTURE and ARIS. For example, PICTURE and ARIS provide similar views on the processes. However, PICTURE is more abstract and therefore addresses a people with a less technical perspective whereas ARIS as a universal tool can be used by both, programmers and end users. • Process models could be used for critically reviewing the tasks and thus deriving potential organisational changes.
Turin	<ul style="list-style-type: none"> • Advantages: it could help to find bottle-necks within our internal procedures; it is very detailed and offers the possibilities to define the process under many aspects; the process modelling method allows making clear the steps required to complete the process and might be useful in the process management in an office. • Disadvantages: there is no way to know if the tool is working or not, after a confirmation. It lacks an icon like the hourglass that shows the system is processing something; the difficulty to browse the processes tree; there is no way to go back to the whole process schema from the sub-process page without selecting it again from the processes tree; it is not possible to change the PBB order in an easy way, but you have to delete and start again from the beginning. • The use of PICTURE is not understandable at a first glance. Users need some training. • The graphic symbols are adequate but sometime it could be more useful to have button with readable text instead of graphic symbols. • The modelling process is not always clear and understandable, for example is difficult to understand how can be selected the actors involved in the sub-process because the tool showed only the external entities and not the people coming from the internal organization structure as it was modelled. It could be more useful to have the possibility to model the whole process before to get into the details of a single PBB. In this way the modelling process could be more flexible. Many processes of the public administration are always the same: ex. Request reception, protocol number assignment, approval, registration on a specific IT procedure. So it could be worth to have the possibility to select a standard process that at most you can change some details. • We could compare PICTURE to IDEF0 for the process modelling component. • An important benefit is the knowledge of the resources involved in a process, in terms of human resources, ICT components, use of paper or other (printer, fax and so on), time required and elapsed time for complete the process.

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Surveyed officers have given a sort of processes modelling methodology advantages, which is used in PICTURE.

The main advantage is the ability to have an overview and “control” of all processes in the organisation, possibility of re-organise and improve processes by identifying problems/weaknesses e.g. duplication of steps, growing of clerks responsibility and competencies, quality and in-time decisions, easy to use. There also have been given some disadvantages, such as: efforts for modelling and updating, there exists danger that the list of PBB couldn't be use in all of the situations in PA unit, the lack of flexibility in some aspects of the tool, the visibility/transparency of process presentation not enough good.

Surveyed suggested that PICTURE's functionality should be expanded by export to visio or bitmap and printing options for modelled processes, more interactive process flow, a graphical differentiation between different task types. There should be also a database of customisable standard processes. Some of the suggestions have already been taken into account by work package 5. Others will be considered during further exploitation activities executed by project partners.

Also an attention has been placed on unique attributes of methodology comparing to others that is used in tools available on market.

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3.2.5 Evaluation of impact measurement methodology

All answers from particular cities concerning evaluation of impact measurement methodology are presented in the table below.

CITY	Evaluation of impact measurement methodology
Lodz	<ul style="list-style-type: none"> • There should be numerical and percent evaluation. The idea is good, but these points should be predefined and common for all instances of administration units. Evaluation should be made by the specialists outside of the PA unit because the user assessment could be too subjective. • PICTURE could support decision process giving additional information. • Disadvantages of reports: they are not enough user-friendly and not quite clear. There should be more comments. Advantages: information of measurable benefits of using particular technology, showing benefits in particular processes. • Impact measurement reports may be useful in public orders procedure pointing the best technology to invest • PICTURE may also support personnel decisions
Amaroussion	<ul style="list-style-type: none"> • A weakness pattern is a useful idea. It is important for the organisation to be able to define its own weaknesses (note: this is already supported by the tool) because the definition of what is a weakness is relative, i.e. weakness of one organisation may not be considered a weakness by another one. • A positive element of the reports is that it is flexible. There are many presentation options and choices for the end user. The reports can be improved by more help on how to run them on the one hand and secondly on how to use/analyse them.
Winterthur	<ul style="list-style-type: none"> • A weakness pattern is a good idea, because of the formalization of implicitly recognized weaknesses. • The measurement methodology enables a problem-oriented perspective on modelled information (including navigation). Thus, analysis results provide new information. • PICTURE could support decision process, but efforts to gather information are not always appropriate to the aimed decision (efficiency of information modelling / input-output-ratio). • Positive elements of the reports: consolidated overview on identified weaknesses; efficient navigation to identified weaknesses in the process descriptions. Negative elements of the reports: definition of weaknesses is quite challenging → method expert should be responsible • The report identifies potential ICT support (using the defined Functionality Groups). Such Functionality Groups can be used to specify public tenders. • PICTURE provides additional information within the decision process (identification of needs, evaluation of impacts).

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Münster	<ul style="list-style-type: none"> • If the pattern was universally valid the participants would regard it as a sensible mechanism. The problem in reality is, however, that a standardized definition of weaknesses is still missing. The perception of weaknesses is also dependent on the project. In reality, deficiencies are recognized by analyzing the processes manually. • PICTURE can show differences and especially basic similarities between departments. It provides information on an abstract level. • The general consensus was that PICTURE could support the process of making decisions. • Advantages of the reports are seen in proving already estimated weaknesses by technical means. • However, the participants judged it as rather critical that no automatic check is carried out whether an entered process is semantically sensible. The problem lies in defining a rule that after a certain activity another specific activity has to be carried out. • The impact measurement reports could be useful in supporting (not in specifying) public order procedure in the field of ICT. • Generally, the participants did not see a necessity to use PICTURE for discovering weaknesses because normally every organization unit knows from experience where the problems are in their processes. You could use PICTURE anyway for supporting already estimated weaknesses by diagrams etc. However, in the participants' opinion you could also use any other tool besides PICTURE. The actual surplus of PICTURE is most likely to be realized when not only one single process but a complete process landscape is analysed.
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Turin	<ul style="list-style-type: none"> • The use of weakness patterns permits to analyze different processes using the same perspective and to identify inside different processes which are the common point of failure in the process management. • With PICTURE it could be possible to know if the introduction of a new ICT component in a specific area of the Turin Municipality could bring benefits also to other offices that have similar processes that were not considered initially by the investment plan. Besides it allows measuring these benefits. A negative aspect is that currently it is not so clear which are the ICT components that could be object of investment: this is due in part to the not detailed enough description of the ICT functionalities needed, and, on the other hand, it is due to the specific requirements that often a Public Administration provide and that make very complicated the process of identifying the needed ICT component. On the strength of what we said previously, it is not possible to make decisions only based on Picture. But in any case it could help. In our department it could be used to prepare the investment plan knowing which is the impact of introducing a new ICT component • The reports are understandable, but there are some aspects that could be improved. Some of the improvements are: <ul style="list-style-type: none"> ○ It could be useful to have reports that summarize the different aspects presented in the tool in separated reports. ○ It is important to have the possibility to export results, for example in excel format. ○ It could be useful to save a measurement impact report and have the possibility to load and to view it in a second time. ○ Currently it is not possible to analyze a single process or a group of processes, but it is only possible to analyze the whole set of modelled processes all together. ○ It could be useful to have a report that analyzes the impact of introducing one specific ICT component. • It could be useful in some cases when the report shows that the investment should address a very narrow set of ICT components that could be specified in a public order procedure. • It could be used to model the Turin Municipality's processes that mainly lack of the support of ICT. Besides it could be used to write a development plan, to support the annual investment plan and to analyze the impact of introducing new ICT component. Of course to arrive to get reports that are of a good quality level many municipal departments should be involved in a hard work to describe their processes in a detailed way.
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Officers from all cities appreciate the ability of processes analysis offered by PICTURE, but also pointed out fact, that weaknesses pattern should be prepared by external expert for objectivity or delivered in PICTURE's knowledge base. According to survey participant's opinion, the results of impact measurement can be useful as one of information on which investment decision will be taken. PICTURE can be very helpful in weaknesses analysis especially when a complete landscape of processes is provided.

The tool should also provide a syntax and semantic validation of modelled processes.

Attendants pointed out that in fact reports are delivering new information but are not clear and understandable for typical user. So, an additional explanatory function should be added. The results of report may be useful in public orders process preparation.

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3.2.6 Evaluation of readiness to use of PICTURE

All answers from particular cities concerning readiness for using PICTURE are presented in the table below.

CITY	Evaluation of readiness to use of PICTURE
Lodz	<ul style="list-style-type: none"> • PICTURE would be bought if the price would be very low and there would be free trainings, weaknesses patterns knowledge base and methodological and technical support. • The effort of time connected with trainings and modelling may not give expected results. Resistance of employees also may be a problem. • If other PAs or institutions would implement PICTURE, so would we, because there's no modelling tool dedicated to PAs on the market. • Potential problems: hosting, time needed for trainings/modelling, convincing higher level management, present law regulations.
Amaroussion	<ul style="list-style-type: none"> • We would use PICTURE however the conditions for this would be a strong commitment by the political leadership, appropriate training of personnel (especially younger employees who are more positive to new ICTs) and appropriate work culture (more adaptive to changes and working with new ICTs). • Better localization is required (Greek version), further flexibility (e.g. possibility to describe variants also in text, not in percentages of occurrence), layout more similar to flowchart. Finally, it is recommended not to use Java for PICTURE and to be able to view it from other browsers too (not only Mozilla).
Winterthur	<ul style="list-style-type: none"> • Investment decision depends on the conditions; prerequisites: technical and methodological support and maintenance; investment and operation costs • As a consortium member, we feel quite informed about PICTURE. • PICTURE helps to make people think about processes. • An interest in learning and using a PICTURE depends on its benefits. • Definition of weaknesses requires expert knowledge, also training needed. Intensive use of the tool necessary to benefit. • The methodology works quite well (no major improvements needed). The prototype needs to be further developed in order to reach product maturity.
Münster	<ul style="list-style-type: none"> • The participants saw the risk that there might be a difference in the perception which objects are pursued if the modeller is not the same person as the one who carries out the measurement impact. Furthermore there might be a different understanding of e.g. the attributes between different modellers. • One participant also regarded it as a risk that the individuality of each process gets lost when using the aggregated impact measurement of PICTURE. • If a tool provides additional findings and performs a new task, there will surely be an interest to use it. It therefore depends on the task. However, the willingness to use PICTURE might be higher in municipalities which have not done a modelling project yet. • The participants regarded as a general problem that modelling processes and maintaining them continuously takes a lot of time. In reality the responsible officials already have a lot of work to do and therefore cannot afford to model along the way. • The participants suggested that the design of PICTURE should be geared to the one of a desktop application. Furthermore the scroll bars should be avoided if possible. In general, the PICTURE tool should be structured more clearly, more intuitively usable, and similar functions should be presented in a similar design.

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Turin	<ul style="list-style-type: none"> • Before to buy Picture or another tool like this the ICT department should evaluate which could be the work to create within the tool the knowledge about the Turin Organization structure and of the whole set of processes inside the municipality and then it should compare it to the customized activity that often is needed to analyze which are the ICT components that must be introduced in a department. In fact often there are aspects that must be taken into account beside the benefits like time saving and quality, detailed from law constraints or human resources constraints. • Currently the municipality is just starting to model some process and it has not been decided yet which process modelling tool to buy and use. So it could be useful to gather more experience on this tool and to learn some technical details. • It takes several time in modelling processes. A specific office should take care of the configuration of the tool, modelling the processes and gather the impact analysis. • It could be interesting to make a detailed comparison between two different tools, one of which is PICTURE. For this goal it is important to gain a detailed knowledge of all the tool aspects. • The user interface is very poor and the tool looks not very usable. The user interface needs a detailed revision in order to make the list more readable, to improve the browsing between each component, to make clear which are the action buttons and other minor aspects that could improve the use of the tool. From the point of view of the modelling process, it should be more flexible. The modelling phase is not the most important part of PICTURE so why not simplify the managing of the PBB, reducing the constraints in their creation (sequence) or separating the work of “drawing” the sequence of PBB from the part of the description of the attributes. It could be easier to draw the entire process first, and then to go into the details of the attributes. • It is not very clear during the measurement of impact phase, when you must load the ontology model. It could be helpful if the system register the last time you load it and show you the date and time. In this way it is possible to know, if something is changed from the last loading, if you need to load the ontology model again or not.
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All survey's participants are interested in PICTURE implementation, but also they are giving some conditions, such as: low cost, support and trainings. They anticipate that PICTURE will be used in PAs only if it will bring established benefits. The problems also could occur in convincing management to PICTURE's methodology and urging PA's employees for task modelling. The case that also can be a problem is in different understanding of details in modelling tasks (eg. attributes or PBBs).

In officers opinion PICTURE's methodology is full grown, but the tool should be continuously improved.

There is a chance to implement PICTURE in some European PAs, because some municipalities are starting modelling processes and need tool that will support them.

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3.2.7 Evaluation of practical results of PICTURE usage

All answers from particular cities concerning evaluation of practical results are presented in the table below.

CITY	Evaluation of practical results of PICTURE usage
Lodz	<ul style="list-style-type: none"> We would recommend the maturity version of PICTURE to other users.
Amaroussion	<ul style="list-style-type: none"> We would definitely recommend the (commercial) version of PICTURE to other public administrations. The City of Amaroussion could even play the role of local IT consultant for other administrations providing technical support and appropriate training.
Winterthur	<ul style="list-style-type: none"> We would recommend methodology of PICTURE to other potential users, but tool: not yet.
Münster	<ul style="list-style-type: none"> The results provided by PICTURE can contribute only partly to the decision because a lot of other factors also play an important role, which are not integrated in PICTURE, e.g. political influence. There was a consensus that PICTURE can rather support the preparation of a decision. By providing access to the process models for all participants the models can be used continuously. Furthermore you have to encourage the actors to use them. Advantages of PICTURE that were mentioned are identifying processes, gaining knowledge about them, providing key figures and preparing decisions. Furthermore activities are made transparent. However, the results will only be expressive if a large number of processes is analysed. Furthermore the processes are too abstract for giving valuable information. Finally the participants regarded it critically that the processes have to be maintained continuously.
Turin	<ul style="list-style-type: none"> The PICTURE results are valid, but they are not sufficient. They provide a good point of start in the decision process. Currently we didn't start to consider how it is possible to establish a continuous usage of PICTURE. It is interesting having a complete set of processes modelled inside the tool, but, if it is not possible to export and save in an external format a modelled process, is not efficient at all having to run an impact measurement on all the modelled processes each time you run it. In fact is not possible to select the subset of processes on which run the impact measurement.

PICTURE can support decision making in survey's participants opinion, but modelled processes are too abstract to be seen as a valuable source of information. Survey's participants declared their readiness for recommending PICTURE's methodology for other PAs units. They also think that PICTURE tool should be upgraded.

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4 Annex

The questions in our focus were as follows:

1. Evaluation of information needs in the field of ICT in PA.
 - a. What kind of information do you need when considering investment in ICT?
 - b. How does the process of decision of investment in ICT in your organisation unit look like?
 - c. Has your organisation unit some independence in making decisions of investment in ICT?
 - d. What kind of benefits do you expect after investing in ICT in your organisation unit?
2. Evaluation of processes modelling needs.
 - a. How are tasks described in your position?
 - b. Do you think that a complex description of procedures at all positions is needed in your organisation unit?
 - c. Does process of updating description of procedures really exist in your organisation unit?
 - d. Do you think that using process modelling would assist disclosing defectiveness in the PA unit e.g. operation doubling, delay or defective realisation of a specific function, excessive overload of a specific work position etc.
3. Evaluation of PICTURE modelling methodology.
 - a. What advantages and disadvantages of process modelling could you point out?
 - b. Is learning to operate the PICTURE-tool easy for you?
 - c. Are the graphic symbols readable and adequate to respective functions?
 - d. Is the way of access to the process and passing the process for modelling understandable and efficient in your opinion?
 - e. To which, known to you, process modelling tools could you compare PICTURE?
 - f. What other benefits could one achieve by modelling apart from supporting process of investment in ICT?
4. Evaluation of impact measurement methodology.
 - a. What is your opinion about the idea of defining weakness patterns as a principle for judgement about effectiveness of ICT investments in particular processes?
 - b. What new information could be gained due to PICTURE use?
 - c. Do you think that PICTURE could support your decision process in the field of ICT?
 - d. What are the good and the bad sides of the reports?
 - e. Do you think that the impact measurement reports could be useful in specifying public order procedure in the field of ICT?
 - f. What possibilities do you see to include PICTURE into the chain of making decisions?
5. Evaluation of readiness to use of PICTURE.
 - a. Would you buy PICTURE for your unit? What conditions have to be fulfilled to convince you?
 - b. Would you like to learn more about PICTURE?
 - c. What are your hopes and apprehensions considering usage of PICTURE in your unit?
 - d. As so numerous modelling tools are used already in the field of ICT, do you think that there will be an interest in learning and using a new one?
 - e. What potential problems connected with PICTURE's implementation and usage

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do you see?

f. What should be improved in PICTURE in your opinion?

6. Evaluation of PICTURE usage's practical results

- a. When giving PICTURE results into a decision process: are the results valid for final decisions and what aspects of results are referred?
- b. How can you establish/have you established a continuous usage of the PICTURE results?
- c. What are the advantages and disadvantages of PICTURE results regarding the continuous usage?