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Study on e-Procurement Measurement and Benchmarking MARKT 2011/097/C

Lot 1 – Public Procurement Performance Indicators

Performance Indicators Report D3 - Final

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EXECUTIVE SUMMARY

The performance measurement system: main goals

This report is the final revised version of the "Performance Indicators Report D3" of the "Study on e-Procurement Measurement and Benchmarking – Lot1" entrusted by the European Commission DG Markt to IDC and Capgemini. This report presents the design of the monitoring and measurement system of e-procurement performance in Europe and was finalized after discussion and feedback by the EC and the main stakeholders at the e-Procurement Seminar held on 14 December 2012 in Brussels. To do so, we designed an "ideal indicator system", investigated data collection requirements and developed a process of implementation, which will be tested soon with a proof of concept trial by a small sample of e-procurement platforms. The main indicators and the overall structure of the indicator system were developed with the support of an Advisory Panel of stakeholder representatives.

The main goals of the indicator system are to measure the performance of e-procurement systems in Europe in terms of take-up, efficiency and effectiveness, and monitoring the achievement of main EU public procurement policy goals. The indicators were selected on the basis of the analysis of the main drivers, barriers and key success factors of e-procurement adoption.

The indicators are designed in such a way as to allow the measurement of public procurement efficiency and effectiveness, once the transition to full e-procurement is completed. Thus, the e-procurement indicators will not become obsolete once the transition is completed, they will measure the efficiency and effectiveness of public procurement as a whole. (e.g. e-procurement take-up will become total value of public procurement).

The main indicators targeted by the system are presented in the table below. They measure the achievement of the main EU policies promoting the full transition from paper-based to electronic procurement, the full participation of SMEs and cross-border Economic Operators to e-procurement/procurement, as well as the price reductions, lower frequency of litigation, time saved and greater transparency enabled by the adoption of e-procurement.

The definition of the indicators is still open to revision and finalization, based on the results of the trial carried out in the first quarter of 2013 with a panel of e-Procurement platforms and further feedback from the EC.

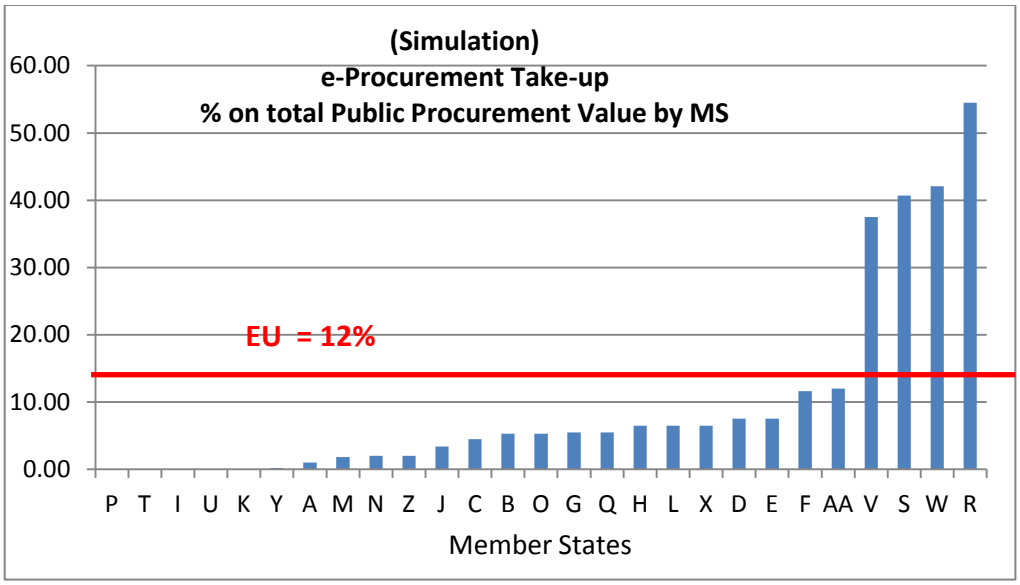
Policy Goals	EU Top level Take-up indicators
Full transition to e-Procurement	E-procurement take-up in value (% of total public procurement)
	E-procurement take-up in volume (% of total number of contracts)
Full participation of SMEs to e-procurement/procurement	E-procurement take-up by SMEs in value and volume (over total public procurement)
Enablement of cross-border e-procurement/procurement	E-procurement take-up by cross-border Economic Operators (in value and volume (over total public procurement)

Policy Goals	EU Top level Performance indicators
Improve effectiveness of public spending	E-Submission Price Reduction Indicator
	E-Submission Reduction of Litigation indicator
Improve efficiency of procurement processes	E-Tendering Efficiency Improvement indicator for Contracting Authorities
	E-Tendering Efficiency Improvement indicator for Economic Operators
Improve ease of access of public procurement	E-Submission Ease of access indicator
Improve transparency of public procurement process	E-procurement transparency indicator towards buyers and Economic Operators

Visualisation of the indicators

The take-up indicators measure the number and value of public procurement contracts that were processed electronically, up to and including at least e-submission. This is the minimum package to identify a contract as processed online.

The figure below shows a simulation of how the take-up indicators could be visualised and presented, for each MS and the EU level indicator.



Source: IDC 2012

Methodology and Structure of the Indicator system

The Indicator System is based on a hierarchy of indicators, calculated elaborating a series of basic indicators based on data collection from a sample of e-Procurement entities (e-PEs). The basic indicators are aggregated into synthetic indicators per measurement area, or per Member State; country level indicators are in turn aggregated in top-level EU indicators. This is a modular, flexible but coherent system which respects the good practice principles of benchmarking: comparability, flexibility, reliability, solidity, feasibility and sustainability.

<table>
<tr><td colspan="12">Top Level Indicator EU</td></tr>
<tr><td colspan="6">Synthetic Indicator Country 1</td><td colspan="6">Synthetic Indicator Country x</td></tr>
<tr><td colspan="2">Synthetic Indicator Platform 1</td><td colspan="2">Synthetic Indicator Platform 2</td><td colspan="2">Synthetic Indicator Platform x</td><td colspan="2">Synthetic Indicator Platform 1</td><td colspan="2">Synthetic Indicator Platform 2</td><td colspan="2">Synthetic Indicator Platform x</td></tr>
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</table>

Source: IDC 2012

A key objective is the development of a balanced set of core indicators, which can be shared and accepted by all the MS and a majority of stakeholders. Each MS – each authority – is perfectly free to develop the indicator system further, adding more detailed and specific indicators to respond to their own information needs. The methodology suggested is flexible enough to allow these further efforts, which may enrich the value added of the common measurement system.

Data collection Issues

According to the plan, a sample of e-procurement entities will be asked to provide data about e-procurement implementation, initially through survey-like methodologies and later through the automation of data collection. This means to estimate the share of the e-procurement flow intercepted by the entities in the sample, in order to extrapolate the indicators to the national level or EU level.

Unfortunately, this data is insufficient to calculate all the targeted indicators in their "ideal" format, based on the total market data. The take-up and performance indicators require the collection of comparable data on traditional public procurement value, volume and specifics such as the take-up by SMEs, which is currently unavailable.

Eurostat provides valid data only on the total value of public procurement. In practice, if we consider as "ideal" the indicators based on the total market and "sample" the indicators based only on the sample data, in the first phase of the measurement system we should achieve the "ideal indicator" for the value take-up and the "sample indicators" for all other measurements.

Roadmap of the measurement system

The development of the measurement system will accompany the diffusion of e-procurement in Europe. According to the plan, the measurement capacity (the sample of platforms) should increase in size and quality. In the medium term, the EC should also encourage the MS and Eurostat to start a process of systematic collection of comparable data on public procurement, compatible with the specifics of the measurement system. If this can be done, it should be possible to move towards the calculation of all the take-up "ideal" indicators.

The flexibility of the system will enable the evolution of the take-up and performance indicators, following the maturation of the market. Once the transition to fully electronic procurement will be completed, the take-up indicators can transform to indicators measuring public spending, which will always be useful and relevant. The need to measure SMEs and cross-border Economic Operators participation to e-procurement will not disappear soon. The indicators measuring efficiency and effectiveness

of e-procurement will maintain their validity in time, moving from comparison with traditional paper-based procurement to measurement of progress in time and "best in breed" benchmarks. If the benchmarks are based on external sources, they can be revised periodically to keep up with new challenges.

The report provides a detailed description of the main indicators and the development process of the measurement and monitoring capacity.

1. INTRODUCTION

1.1. Background and Objectives

This deliverable is the fourth release of the Performance Indicators Report (D3) of the Study on e-Procurement Measurement and Benchmarking – LOT 1 – on Public e-Procurement Performance Indicators entrusted by the European Commission to IDC and Capgemini Consulting.

The main goal of this project is to design, set up and test a systematic and comparable monitoring capacity of the e-Procurement infrastructure and performance across Europe. The project includes two main Workstreams:

1. Mapping and measuring the e-Procurement landscape in Europe;
2. To design, test and recommend a set of e-Procurement performance indicators for a pan-European performance measurement system.

The main objectives of Workstream 2 are the following:

- To identify the main requirements of the key stakeholder categories for monitoring and performance indicators of e-Procurement;
- To define the criteria for the measurement of performance of e-Procurement systems, based on the key success factors/ barriers, taking into account the different points of view of the main stakeholder categories;
- To design a set of idealized indicators (an indicator system) with the following characteristics:
    - able to measure performance (take-up, efficiency and effectiveness) of the e-Procurement systems, at present and in time, feeding trend analysis;
    - based on data generated from the e-Procurement systems themselves (either automatically, or with a reasonable effort), produced through sustainable information flows;
    - able to measure the achievement of the main goals of e-Procurement policies, first of all the smooth migration from paper-based to electronic procedures across Europe; but also the level of participation of SMEs and cross-border bidders in Public Procurement.
    - linked with the assessment of the key success factors and barriers to e-Procurement take-up, able to provide insights for practical and policy action by main stakeholders.
- To test and fine-tune the indicator system, through a trial to be organized with the collaboration of a group of e-Procurement platforms in a sample of Member States (proof-of-concept trial);

- To review the design of the measurement process and of the indicator system, based on the findings from the trial and the feedback from the participating platforms;
- To propose a high-level implementation plan for the roll out of this Pan-European e-Procurement Performance Measurement system, indicating the actions to be taken by the main stakeholders.

We should also keep in mind that e-Procurement will hopefully be, over time, the new way for procuring, not only a new channel for procuring. Therefore, this will help understanding the main goals and the policies of Procurement in general; nevertheless, as this is a long-term objective, we are not in a position to achieve it during the Workstream 2. Currently, to measure the Procurement objectives and policies, the data needed are sourced by Eurostat.

This report is the first of Workstream 2 and presents the revised draft of the set of idealised Indicators of e-Procurement in Europe, based on the analysis of the requirements of the key stakeholder categories and of the key drivers/barriers to e-Procurement take-up, analysed in Workstream 1.

This deliverable is the starting point of the process to set up a monitoring and measurement capacity. Therefore, it presents the main principles and approaches, which, once tested with the trial, will be revised in order to present a new version of the set of indicators. Besides, it is important to keep in mind that a set of indicators having, among others, the aim to measure the achievement of policy goals is necessarily a set that will need updates over time. It is therefore very important to build the set of indicators to allow the necessary updates.

The main requirements of the stakeholders and the analysis of the main barriers-drivers to e-Procurement adoption are presented in **D1 – Landscape of e-Procurement in Europe.**

The first draft of the Indicator system was submitted to the EC and the Advisory Panel of e-Procurement Platforms in July 2012. The feedback from this discussion was used for a first revision. Further comments and discussion with the EC are now used to prepare this second release presented on October 8, 2012. After further detailed feedback the study team prepared this fourth release.

The deliverable is without prejudice to the offer made by IDC and Capgemini Consulting for this project. The document may be up-dated at the request of the Commission to ensure that the objectives of the study are achieved, within the limits established by the contract.

1.2. Structure of the Report

This report is structured as follows:

- The Executive summary presents a self-standing summary of the main goals, methodology and indicators of the measurement system.
- Chapter 1 presents the introduction and background
- Chapter 2 presents the overview of the indicator system, the main principles guiding it, the structure of the system, the main outputs, the methodological approach;
- Chapter 3 presents in detail the take-up indicators;
- Chapter 4 presents in detail the performance and benefits indicators;
- Chapter 5 presents the main steps of implementation of the system of indicators, including the organization of data collection.

2. OVERVIEW OF THE INDICATOR SYSTEM

2.1. Main Principles

This chapter presents the summary view of the set of idealized e-Procurement performance indicators for a pan-European performance measurement system. Rather than a "set" we prefer to call this a "system of indicators", since they are linked by a common methodology, similar presentation and explanation tools, and similar data collection methods.

By "idealized" indicators, we mean those measuring all the key features of e-Procurement systems, responding to all the possible objectives and information needs of main stakeholders. Once submitted to a reality check in terms of feasibility of data collection, usability and actual value added, the indicator system is likely to be changed, streamlined and pared down to the most efficient/effective combination of data.

As anticipated above, the indicator system should be:

- able to measure performance (take-up, efficiency and effectiveness) of the e-Procurement systems, at present and in time, feeding trend analysis;
- based on data generated from the e-Procurement systems themselves (either automatically, or with a reasonable effort), produced through sustainable information flows;
- able to measure the achievement of the main goals of e-Procurement policies, first of all the smooth migration from paper-based to electronic procedures across Europe; the level of participation of SMEs and cross-border bidders in Public e-Procurement etc.
- linked with the assessment of the key success factors and barriers to e-Procurement take-up, able to provide insights for practical and policy action by main stakeholders.

The main scope of the indicator system is the EU: therefore, it is focused on comparable indicators across the EU MS. As for all European benchmarks, this indicator system will never be able to reflect all the depth and specificities of national contexts, not even in the first, idealized phase.

Rather, the main goal is to develop a balanced set of core indicators, which can be shared and accepted by all the MS and a majority of stakeholders. Each MS – each authority – is perfectly free to develop the indicator system further, adding more detailed and specific indicators to respond to their own information needs.

The methodology suggested is flexible enough to allow these further efforts, which may further enrich the value added of the common measurement system. To some extent, this happened with the EU e-Government benchmarking system of the availability of online public services, developed by Capgemini-IDC on behalf of the EC, which was used many times by national and local authorities to carry out additional measurements in their areas.

Building on this experience in the development of European benchmarks, we have identified the following main principles to which we plan to adhere in the development of the e-Procurement measurement system:

- **Principle 1**: The monitoring system is consistent, meaning that it allows both comparisons over time and comparison across countries. The method underlying the assessment is the same for all countries involved.
- **Principle 2:** The measurement is responsive to policy concerns and continuously evolving.
- **Principle 3**: The findings are relevant, politically & professionally; their presentation is interesting and stimulating for the main stakeholders and interested third parties.
- **Principle 4**: The measurement process is participative and collaborative.
- **Principle 5**: The measurement process ensures continuous learning and experience sharing.
- **Principle 6**: The Monitoring system is transparent; outputs are openly shared with participating stakeholders.
- **Principle 7:** The Monitoring system is independent, representative and authoritative.
- **Principle 8**: The Monitoring system aspires to be internationally recognized as a sound and reliable set of performance measurements.

More specifically, the main goal is to design a high quality system of indicators with the following characteristics:

- **Comparability** between platforms, between MS and MS clusters, and comparability in time to monitor changes;
- **Flexibility**, to adapt to the evolving context of e-Procurement
- **Reliability and solidity**, both for the scientific quality of the methods used to calculate the indicators and for the quality of the data used to measure them
- **Feasibility and sustainability**, with a reasonable balance between (repeated) data collection and elaboration costs and the value added guaranteed by the indicators. To do so, it has already been established that most of the basic data should be generated from the e-Procurement platforms.
- **Clarity and Transparency:** calculation methods should be based on proven methodologies, clearly documented, and the meaning of the indicators should be unambiguous.
- **Representativeness** is representing the balance of experiences across the European e-Procurement landscape.

2.2. Main Drivers and Barriers

The study team investigated the main drivers and barriers of e-Procurement adoption for national policy makers (concerning their country) and for Contracting Authorities (concerning their specific situation). The main results are presented briefly below, as an input to the definition of Key Performance Indicators relevant for the main stakeholders.

As shown in the tables below, both policy makers and CAs agree on the most relevant drivers for e-Procurement adoption, that is: savings, transparency, and efficiency/ productivity benefits. The other factors are considered less relevant, even though they are not marginal. These drivers correspond quite clearly to key success factors and fall into two of the 4 main areas identified for our system of indicators, that is Take-up Indicators (which are based on levels of use) and Performance and benefits indicators (which are impacts indicators), as illustrated in Table 2.

Table 1: Main Drivers of e-Procurement adoption in the opinion of Policy makers and Contracting Authorities

	National Policy Makers		Contracting Authorities	
Drivers	Price reduction of Purchases	**1**	Efficiency and productivity benefits	**1**
	Transparency of processes	**0.96**	Price reduction of Purchases	**0.86**
	Efficiency and productivity benefits	**0.86**	Transparency of processes	**0.82**
	Better access to the public markets by Economic Operators	**0.24**	Improvement of competition for Economic Operators	**0.28**
	Confidence of achieving full compliance	**0.22**	Greater choice of Economic Operators for public buyers	**0.11**
	Greater choice of Economic Operators for public buyers	**0.14**	Confidence of achieving full compliance	**0.05**

(Index 0 to 1: the factor with the highest number of votes from interviewees is index 1, all the others are indexed based on their relative distance from the 1st)

Source: IDC 2012

Table 2: Key Performance Indicators based on Drivers

Drivers	Type of KPI
Price reduction of Purchases	Performance and benefits indicators
Transparency of processes	Performance and benefits indicators
Efficiency and productivity benefits	Performance and benefits indicators
Better access to the public markets by Economic Operators	Take up indicators
Confidence of achieving full compliance	Take up indicators

Greater choice of Economic Operators for public buyers	Take up indicators

Source: IDC 2012

The analysis of barriers to e-Procurement adoption is more articulated, presents more differences between National policy makers and CAs, and is connected with the conditions of access and use of e-Procurement. Based on this analysis, we identified the potential indicators and measurement areas correlated with overcoming these barriers. They can be grouped in three main areas: increased awareness of benefits (falling into the Performance and benefits measurement area); greater ease of use (which we have classified among Take-up indicators) and availability of services (also classified within Take-up indicators).

Table 3: Main Barriers to e-Procurement adoption in the opinion of stakeholders

	National Policy Makers		Contracting Authorities	
Barriers	Reluctance/ Inertia of Contracting Authorities	**1**	Reluctance/ refusal by potential Economic Operators	**1**
	Reluctance/ refusal by potential Economic Operators	**0.61**	Insufficient awareness about benefits	**0.98**
	Insufficient awareness about benefits	**0.49**	Onerous technical requirements for bidder authentication	**0.82**
	Complex and onerous regulatory requirements	**0.35**	Reluctance/ Inertia of Contracting Authorities	**0.81**
	Insufficient/ difficult access and/or usability of e-Procurement for Economic Operators	**0.3**	Lack of availability of e-Procurement services	**0.6**
	Onerous technical requirements for bidder authentication	**0.26**	Complex and onerous regulatory requirements	**0.6**
	Lack of availability of e-Procurement services	**0.2**	Insufficient/ difficult access and/or usability of e-Procurement for Economic Operators	**0.47**

(Index 0 to 1: the factor with the highest number of votes from interviewees is index 1, all the others are indexed based on their relative distance from the 1st)

Source: IDC 2012

Table 4: Key Performance Indicators correlated with Barriers

Barriers	Type of KPI
Reluctance/ Inertia of Contracting Authorities	Awareness of benefits – Performance and benefits indicators
Reluctance/ refusal by potential Economic Operators	Awareness of benefits – Performance and benefits indicators
Insufficient awareness about benefits	Simplicity and ease of use of procedures and services – Take-up indicators

Complex and onerous regulatory requirements	Simplicity and ease of use of procedures and services – Take-up indicators
Insufficient/ difficult access and/or usability of e-Procurement for Economic Operators	Availability and usability of services – Take-up indicators
Onerous technical requirements for bidder authentication	Simplicity and ease of use of procedures and services – Take up indicators
Lack of availability of e-Procurement services	Availability of services – Take up indicators

Source: IDC 2012

2.3. Monitoring and Information Needs

The monitoring of e-Procurement is still limited. Based on interviews with national policy makers and a sample of 44 Contracting Authorities we have identified the type of data considered relevant (ranked in the following table). More interestingly, we have calculated an Information Gap Index, defined as the gap between the type of data needed, and the type of data both needed and collected. This is measured through the ratio between the number of interviewees collecting data that they consider relevant, and the number of interviewees who consider that data relevant but do not collect it. The results are presented in a following table through a gap index from 0 to 1, where 1 means that none of the interviewees collect the data they consider relevant (maximum gap), while 0 means that all the interviewees collect the relevant data (no gap). There are some differences between national policy makers (interested in the monitoring of overall e-Procurement information flows) and Contracting Authorities (interested in information for their own needs).

Table 5: Information needs - Gap between relevance and availability

Type of Data / National Policy Makers	Rank	Gap Index	Type of Data / Contracting Authorities	Rank	Gap Index
Drivers and barriers	**1**	**0.8**	Drivers and barriers	**1**	**0.9**
Number and type of Economic Operators	**2**	**0.7**	Benefits achieved through e-Proc	**2**	**0.8**
Benefits achieved through e-Proc	**3**	**0.6**	Level of take-up of e-Procurement	**3**	**0.6**
Level of take-up of e-Proc	**4**	**0.4**	Number and type of Economic Operators engaged	**4**	**0.6**
Type of CAs engaged in e-Proc	**5**	**0.4**	Volume and value of e-Procurement	**5**	**0.5**
Number of tenders processed online	**6**	**0.3**	Online publication of contract notices	**6**	**0.4**
Number of contract notices published online	**7**	**0.2**			

Information Gap Index: Ratio between the number of MS who need a certain typology of data and do not collect it, and those who need it but collect it. Scale:

0-1, where 1 = data is needed but is not collected and 0 = data is needed and is collected.

Source: IDC 2012

Concerning policy makers, for a few typologies of data the gap is small: that includes the number of contract notices published online, the number of tenders processed online, the type of CAs engaged in e-Procurement. However, for most of the typologies of data the gap is large, because a majority of policy makers do not collect them but consider them relevant to have. The largest gap concerns the benefits achieved through e-Procurement, the drivers and barriers, and the number and type of Economic Operators.

In the case of CAs, the gap between information collected and information relevant but missing is definitely larger. Only the online publication of contract notices seems to be monitored by a majority of CAs (gap 0.4), followed by the volume and value of e-Procurement (0.5). For most other categories of data, there is a large gap, particularly drivers and barriers, the monitoring of benefits and the level of take-up.

Overall, the table shows a clear gap between current information flows and information needs, pointing to the existence of potential demand for indicators in the areas where current information flows are insufficient.

2.4. Structure of the Indicator System

The Indicator System is based on a hierarchy of indicators, calculated elaborating a series of basic indicators based on data collection from a sample of e-Procurement entities (e-PEs). The data collected are structured into basic indicators in order to allow comparability. The basic indicators are aggregated into synthetic indicators per measurement area or per Member State (country); country level indicators are in turn aggregated in top level EU indicators (Table 6). The aggregation of the indicators is based on the calculation of averages or other algorithm, which may be weighted, if necessary, to take into account variations in relevance by type of platform, MS population, type of service or other factors. The methodological approach to aggregation and weighting is explained in the following paragraphs.

Table 6: Hierarchy of Indicators

<table>
<tr><td colspan="12">Top Level Indicator EU</td></tr>
<tr><td colspan="6">Synthetic Indicator Country 1</td><td colspan="6">Synthetic Indicator Country x</td></tr>
<tr><td colspan="2">Synthetic Indicator Platform 1</td><td colspan="2">Synthetic Indicator Platform 2</td><td colspan="2">Synthetic Indicator Platform x</td><td colspan="2">Synthetic Indicator Platform 1</td><td colspan="2">Synthetic Indicator Platform 2</td><td colspan="2">Synthetic Indicator Platform x</td></tr>
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</table>

Source: IDC 2012

The data collection and the calculation of the basic indicators takes into account the main characteristics of the e-Procurement entities (based on the classification of the Census database of European e-PEs) and the availability and sophistication of the offering. The methodological

approach to the e-PEs classification and to availability of the offering is explained in chapter 5.

2.5. Main output: the Top Level Indicators

The main goal of the indicators system is to measure the achievement of the main policy goals relative to the implementation of e-Procurement in Europe. To do so we have selected two main measurement areas corresponding to the most relevant policy goals, they are:

- **Take-up of e-Procurement**

This includes top level indicators measuring progress towards the following policy goals:

- **Full transition to e-Procurement** that is 100% take-up of e-Submission for all public procurement contracts;
- **Full participation of SMEs to e-Procurement that** is removing all obstacles preventing SMEs from accessing the public procurement market through e-Procurement;
- **Enablement of cross-border e-Procurement,** that is insure that e-Procurement enables cross-border Economic Operators to compete fairly and equally with domestic Economic Operators in public procurement.

- **Performance and Benefits of e-Procurement**

This includes a small number of top level indicators measuring the achievement of the following main policy goals (selected on the basis of the KPI identified above):

- Improve the effectiveness of public spending
- Improve the efficiency of public procurement processes
- Improve the usability and ease of access of e-Procurement services
- Improve the transparency of public procurement processes

The top-level indicators, which have been selected to monitor and measure progress towards these policy goals, are illustrated in the following table.

Table 7: Summary of EU Top Level Indicators

Policy Goals	EU Top level Take-up indicators
Full transition to e-Procurement	E-procurement take-up in value (% of total public procurement)
	E-procurement take-up in volume (% of total number of contracts)
Full participation of SMEs to e-procurement	E-procurement take-up by SMEs in value and volume (over total public procurement)
Enablement of cross-border e-procurement	E-procurement take-up by cross-border Economic Operators (in value and volume (over total public procurement)
Policy Goals	**EU Top level Performance indicators**
Improve Effectiveness of public spending	E-Submission Price Reduction Indicator
	E-Submission Reduction of Litigation indicator
Improve efficiency of	E-Tendering Efficiency Improvement indicator for Contracting

procurement processes	Authorities
	E-Tendering Efficiency Improvement indicator for Economic Operators
Improve ease of access of public procurement	E-Submission Ease of access indicator
Improve transparency of public procurement process	Transparency Indicator of e-procurement for buyers and Economic Operators

Source: IDC 2012

The following chapters will explain the approach followed to build and calculate the indicators and then we will present the structure of the system of indicators for the two selected top-level indicators, i.e. the Take-up indicators and the Performance indicators.

2.6. Methodological approach

2.6.1. A modular system of indicators

The system of indicators proposed is modular. The modularity of a system of indicators is the level to which the system allows a disaggregation and a recombination of the basic indicators. This is a valuable choice because of the flexibility and performance benefits it lends to the indicators.

Modularity allows changing the scope and the content of the indicators, if and when necessary. In order to achieve a high level of modularity, it is necessary to build the system from the bottom up, based on basic indicators with a high level of granularity. This allows combining the basic indicators into synthetic indicators in a variety of ways. To do so, in our case, the basic indicators need to be collected at the most disaggregated level as possible.

The indicator system is based on a supply side approach (of e-Procurement services). This means that data are collected from the services Economic Operators, which are the e-Procurement entities. This presents some strong and weak points: it allows a full analysis of the offering and of the delivery process of the services, but it makes difficult to assess the usability and quality factors, which are relevant to motivate the users. In addition, a supply side measurement system is not always the best way to measure the level of use that is take-up. Ideally, to complete the measurement system we should also develop a symmetric indicator system based on a demand side approach, collecting data from the Contracting Authorities.

The modularity of the system potentially allows calculating synthetic indicators according to different dimensions and levels including for example:

- By type of service (for example e-submission)
- By type of entity (single entity, typology of entity according to the Census taxonomy of ePEs; portal, platform…)
- By geographical level such as:
  - Local level (regional, federal, ,,,,)
  - Country level
  - European level

The choice of indicators depends on the priorities selected, as explained in the following chapters. If new priorities emerge, or if the indicators once measured are not meaningful, it is possible to re-assemble the basic indicators to achieve different priorities or objectives.

2.6.2. The aggregation issues

The aggregation of basic indicators into synthetic indicators, at MS or EU level, is based on different algorithms depending on the scope and the goal of the indicators. From a methodological point of view, each time we define an indicator, it is important to clarify what we are precisely measuring and what is the scope of the indicator. A system of indicators does not have only one objective (what are we precisely measuring) or only one scope. Therefore, each indicator is based on a different algorithm depending on the specific objective of the indicator and on the specific scope of the indicator.

The modularity of the system allows also changing the scope of indicators. Clearly, when changing the scope, the algorithm for the calculation of the indicator needs to be changed.

We are not going to present here the full range of objectives and scopes and the corresponding algorithms but we only want to clarify that the algorithms will be designed depending on the specific objectives and scopes. A technical annex will be prepared after the trial, detailing the definition and calculation method of each indicator.

If the available data will not be sufficient to calculate synthetic indicators by area or by country, we will calculate the indicators at sample level and extrapolate to the EU level. All aggregation choices will be transparent and clearly documented.

There are ways of aggregating the basic indicators which may be meaningless or misleading. The study team is well aware of this and will avoid these aggregations.

2.6.3. The weights: a tool to modulate synthetic indicators

Weighting is a calculation method, used to increase or reduce the influence of some indicators or observations in the process of aggregation. Weighting is used to counterbalance the bias built in a sample of observations or to increase the importance of some component.

Our indicator system is designed as an idealised system to be applied to the whole population of e-Procurement Entities. However, the sample of entities from which we can collect data is not the total population. We will use the proof-of concept trial to test the measurement system with a sample (or panel) of entities. Based on the analysis of the profile of the main entities in the sample compared to the profile of the population, it may be necessary to use weighting in the process of calculation of synthetic indicators to correct the results and make them more similar to the total population.

It may also be useful to use weighting when aggregating basic indicators, to reflect the higher importance of some individual indicator compared to others.

Finally, weights may also be useful for a dynamic use of an indicator system. It may happen that the objectives of the phenomena measured change over time or that the components of the indicator change over time. The weights may be a powerful tool to take into account the changes of what we are measuring over time.

The use of weights must be fully transparent and documented. The selection of the weights will be based on objective and transparent criteria depending on the specific goals of the indicator. The decision process about the weights is an iterative calculation. The implementation of weights must be tested, cross-checked and validated to be sure that the weights achieve the predefined objectives.

Where the use of weights will be necessary, we will provide all the details for the selection of the weights into the technical annex explaining the calculation process. The role of the weights and their selection will be validated during the trial process.

2.6.4. Approach to data collection

As explained above, to calculate the indicators, we need a database of basic indicators with a high level of granularity. Sometimes the basic indicators may not be directly used for the calculation of the indicators but we may need them to understand and interpret the indicators. This is the case for example of basic indicators of availability of the offering. We are not planning to present availability indicators, but we need to collect data about the range of offering of e-Procurement services in order to classify the e-Procurement entities and to understand their impact on performance indicators. Obviously, the indicators will be collected for a predefined period, to insure that results refer to the same period (indicatively the calendar year).

For this indicator system, we will use three main categories of data sources:

- The e-Procurement Entities sample: the core data will be collected from the ePEs through an interactive process.
- Eurostat and MS official data on public procurement: several indicators, starting from take-up indicators, but also for example performance indicators, require as a term of comparison specific data on traditional public procurement value, volume, type of procedures, and so on. These data are unfortunately difficult to find and mainly missing. For the quality and completeness of the measurement system it is important that a process of data collection from national public procurement authorities is planned and eventually implemented.
- Estimates by the benchmarking experts to fill in the gap left by data collection. There will be a need for estimating and extrapolating the indicators resulting from the ePEs data collection to the national and EU level. This means to estimate the share of the e-procurement flow intercepted by the entities in the sample.

2.6.5. Evolution of the indicators over time

A system of indicator is designed to be effective over time. Nevertheless, indicators normally need frequent adjustment as they measure phenomena devoted to change over time.

Our system of indicators measures “the infrastructure and the performance” of e-procurement across Europe; since both infrastructure and performance are two dynamic concepts, the system of indicators may need changes over time.

At the current state of play, and because of the current EU policy objectives, the system of indicators is focused on two main measurement areas: the level of take-up and the performance and benefits achieved through e-procurement.

To interpret these indicators we will also need data on the availability of e-Procurement services and the typology of e-procurement entities providing them, based on the taxonomy developed by this project. These data will be collected and used as an input to the main output indicators of the system.

3. THE E-PROCUREMENT TAKE-UP INDICATORS

3.1. Overview and Methodology

The take-up indicators monitor the level of adoption of e-procurement, which is defined as follows:

E-procurement refers to the use of electronic communications and transaction processing by government institutions and other public sector organizations when buying supplies and services or tendering public works. This includes the replacement of paper-based procedures through the Procurement chain.

Within the framework of this study, and in agreement with the EC Green Paper on e-procurement, **we will define as the minimum package for an e-procurement offering the electronic provision of the following services:**

- **e-Notification: online publication of tender notices,**
- **e-Access: online access to tender documents 24/7 in an automatic manner;**
- **e-Submission: online submission of tenders.**

Therefore, the **take-up indicators measure the number and value of public procurement contracts that have been processed electronically, up to and including at least e-submission**. This definition includes also the use of e-auctions (since they require the submission of electronic quotations) and the use of e-ordering when implementing framework contracts, and of course the end-to-end electronic processing of contracts.

In addition, we plan to calculate take-up by SMEs and by cross-border Economic Operators, to monitor the achievement of the main policy goals of e-Procurement. Finally, in order to support an in-depth analysis of the e-Procurement process, the indicators should also be broken down by other variables, such as the type of procurement procedure and the type of purchase (supplies, services, and public works).

The measurement system includes all procurement contracts, both above and below the EU threshold.

To calculate take-up indicators we need two main typologies of data:

- data on the number and value of public contracts processed electronically in the EU and possibly by MS, broken down by typology of winner (SME, cross-border supplier) and the other typologies of interest (type of procedure, type of purchase).
- data on the total number and value of public contracts, in the EU and possibly by MS, broken down in the same way and comparable with the e-procurement data.

The first category of data will be collected from a sample (panel) of e-Procurement entities providing e-Submission (platforms in short), which is being organized by this project. As anticipated, the second category of data in the detail needed and in comparable format is missing.

To deal with these problems, we suggest developing the measurement of take-up indicators according to the following steps:

- **Collection of basic data on take-up from the sample of platforms and development of basic indicators.** This requires establishing common definitions of the units of measurement (for example, what exactly is a contract) and transforming the data used by each platform into comparable basic indicators.
- **Collection of comparable data from Eurostat/ the MS on public procurement (and e-procurement, if available)** according to the specifications of the indicators designed (by number and type of contracts, by SMEs, and so on). Even partial data from some MS may be useful to improve the quality and the solidity of the overall measurement system.
- **Calculation of the total value and volume of e-procurement at MS and EU level**. This means aggregating the basic indicators, but this is not sufficient since the sample data is only a component of the total reality of e-procurement. To take the next step, we need to estimate what is the relative weight of the known sample of e-PEs on the total EU population and extrapolate the sample data to the total market.
- **Calculation of the indicators of take-up of e-procurement in value as a proportion of total public procurement at MS and EU level.** This is feasible because the data on total public procurement in value is available by Eurostat. This will be a "real" indicator of take-up.
- **Calculation of all other indicators of take-up of e-procurement for the sample of platforms.** This will provide valuable evidence about the level and dynamics of take-up of e-procurement in Europe.

The outcome of the steps indicated above therefore should be:

- Take-up of e-procurement in value at the MS and EU level;
- Take-up of e-procurement by SMEs in volume and value at EU level by the sample of platforms, if the sample is sufficient at MS level;
- Take-up of e-procurement by cross-border Economic Operators in volume and value at EU level by the sample of platforms, if the sample is sufficient at MS level.

In practice, if we consider as "ideal" the indicators based on the total market and "sample" the indicators based only on the sample data, in the first step of the measurement system we should achieve the "ideal indicator" for the value take-up and the "sample indicators" for all other measurements.

3.2. Roadmap of the measurement system

The development of the measurement system should aim at improving the quality and breadth of the data collected, to achieve in the medium term:

- the increase of the sample of platforms providing data across the EU and the automation of the methods of data collection, in order to reduce the burden on platforms:
- the systematic collection of comparable data from the MS and/or Eurostat on public procurement and e-procurement, according

to the definitions developed by the measurement system, trying to motivate national authorities to collaboration;
- the inclusion in the TED system, in occasion of the publication of contract notices and contract award notices, of mandatory fields about the use of e-procurement. (This data already exists but the many contracting authorities do not actually publish the information, as the data is not mandatory).

If this can be done, it should be possible to move towards the calculation of the take-up "ideal" indicators.

Finally, once the transition to e-procurement will be completed, the evolution of the measurement system should continue as follows:

- The process of data collection and indicators calculation will be the same, but naturally strengthened and improved;
- Fully automated data collection from the platforms sample;
- Hopefully, consolidated data collection from the national authorities providing periodically the necessary data to calculate all the ideal indicators.

3.3. Description of Take-up Indicators

The following paragraphs present the System of Indicators for Take-up of e-Procurement services and procedures, developed bottom-up from the single platform level, according to the first step identified above. As anticipated the take-up indicators must measure the achievement of the following policy goals.

We will identify as "ideal indicators" the indicators referred to the total market and "sample indicators" those referred to the sample of platforms providing the data.

- **Policy goals**:
    - **Full transition to e-Procurement that** is 100% take-up of e-Submission for all public procurement contracts.
    - **Full participation of SMEs to e-Procurement that** is removing all obstacles preventing SMEs from accessing the public procurement market through e-Procurement.
    - **Enablement of cross-border e-Procurement,** that is insure that e-Procurement enables cross-border Economic Operators to compete fairly and equally with domestic Economic Operators in public procurement.

The hierarchy of indicators will be the following (see also Table 8):

- **Basic Indicators at platform level:**
    - These are indicators calculated taking the basic data provided by platforms and transforming it into comparable indicators, checking that they conform to the definitions established by the indicator system including:
        - Number and Value of contracts awarded in the reference period (last complete fiscal year or last complete calendar year, TBD) processed with or without e-Submission;

        - Number and type of Economic Operators (large enterprises vs. SMEs; domestic vs. cross-border Economic Operators) registered by the platform, bidding for contracts (with or without e-Submission);

- **Synthetic indicators at MS level:**
    - These are indicators calculated as an aggregation of the basic indicators of all the platforms of the sample in a country (sample indicators); if the data is sufficient, it can be extrapolated to the total market of the country (ideal indicator). They include:
        - **Take-up of e-procurement in value**: total value of e-procurement (of contracts processed with e-submission) at the MS level over the total value of public procurement in the same period;
        - **Take-up of e-Procurement in volume**: total number of contracts processed with e-submission by the sample as a % of the total contracts (online and offline) processed by the sample at MS level;
        - **Take-up of e-procurement by SMEs in volume and value**: number and value of contracts processed with e-submission and awarded to SMEs by the platforms in the sample in a country, over the total number and value of contracts processed by the platforms in the sample in a country.
        - **Take-up of e-procurement by cross-border Economic Operators in volume and value:** number and value of contracts processed with e-submission and awarded to cross-border Economic Operators by the platforms in the sample in a country, over the total number and value of contracts processed by the platforms in the sample in a country.
- **Top level indicators at EU level**:
    - These are indicators calculated as an aggregation of the MS level indicators, or extrapolated from the total sample of platforms to the EU level, depending on the quality of data at national level. They include:
        - **Take-up of e-procurement in value**: total value of e-procurement (of contracts processed with e-submission) at the EU level over the total value of public procurement in EU in the same period;
        - **Take-up of e-Procurement in volume**: total number of contracts processed with e-submission by the sample as a % of the total contracts (online and offline) processed by the sample at EU level;
        - **Take-up of e-procurement by SMEs in volume and value**: number and value of contracts processed with e-submission and awarded to SMEs by the platforms in the sample, as a percentage of

the total number and value of contracts processed with e-submission by the platforms in the sample in the EU. This indicator measures the share of SMEs' wins out of the total e-procurement contracts in the sample.

- **Take-up of e-procurement by cross-border Economic Operators in volume and value:** number and value of contracts processed with e-submission and awarded to cross-border Economic Operators by the platforms in the sample as a percentage of the total number and value of contracts processed with e-submission by the platforms in the sample in the EU. This indicator measures the share of cross-border Economic Operators' wins out of the total e-procurement contracts in the sample.

Since the incidence of cross-border wins is likely to be quite low in some MS, we prefer to use the total number and value of contracts as a denominator of the indicator.

- **Measurement scale:** the indicators are measured in %, where 100% = complete take-up. “Best in breed” benchmarks may be calculated.
- **Value added:** These indicators provide a synthetic quantitative view of the level of take-up of e-Procurement responding to all the main policy goals.

These indicators can be segmented also by other relevant variables, specifically the type of procedure used in the procurement process, by the types of purchases (goods, services or public works) and by the value (above/below the EU thresholds). This will depend on the availability and completeness of the data collected.

The table below presents a summary of the top-level EU indicators and the figure 1 presents a simulation of how the top-level take-up indicator in value could be presented.

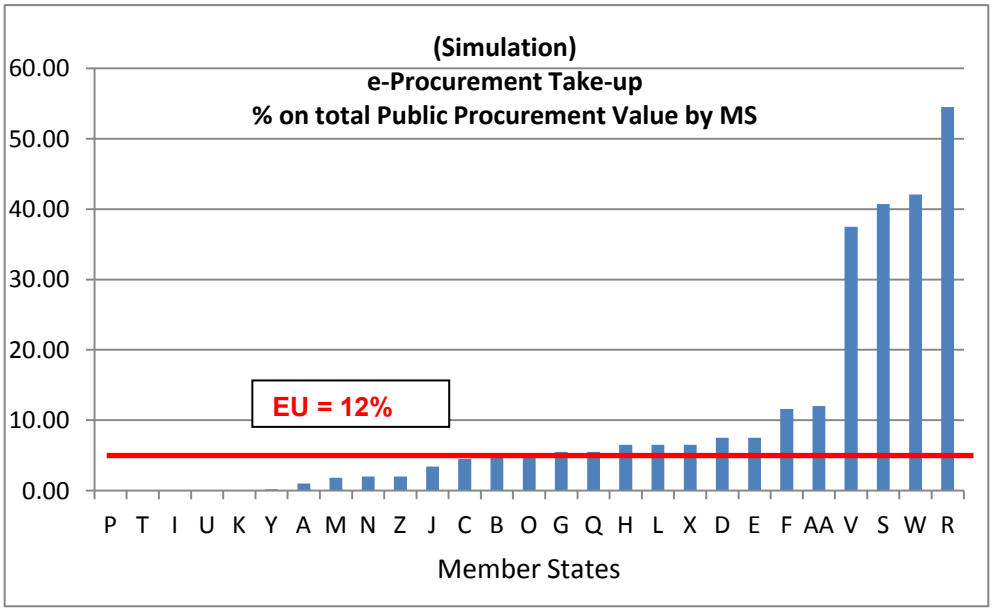
Table 8: Summary of Take-up Top-level Indicators (in green the indicators which are feasible in the short-term)

Top-Level Take-up Indicators - EU			
Policy Goal	**Indicators**	**Measurement / Ideal indicator**	**Measurement / Sample indicator**
Full transition to e-Procurement	Take-up of e-procurement in value	Total value of contracts processed with e-submission in the EU as % of total value of public procurement in the EU	Total value of contracts processed with e-submission by the sample as % of total value of all contracts processed by the sample
	Take-up of e-procurement in volume	Total number of contracts processed with e-submission in the EU as % of total number of contracts in the EU	Total number of contracts processed with e-submission by the sample as % of total number of all contracts processed by the sample

Full Participation of SMEs to e-procurement	Take-up of e-procurement by SMEs in value	Total value of contracts processed with e-submission and won by SMEs in the EU as % of total value of contracts won by SMEs in the EU	Total value of contracts processed with e-submission and won by SMEs in the sample as % of total value of contracts processed with e-submission in the sample
	Take-up of e-procurement by SMEs in volume	Total number of contracts processed with e-submission and won by SMEs in the EU as % of total number of contracts won by SMEs in the EU	Total number of contracts processed with e-submission and won by SMEs in the sample as % of total number of contracts processed with e-submission in the sample
Enablement of cross border e-procurement	Take-up of e-procurement by cross-border Economic Operators in value	Total value of contracts processed with e-submission and won by cross-border Economic Operators in the EU as % of total value of procurement in the EU	Total value of contracts processed with e-submission and won by cross-border Economic Operators in the sample as % of total value of of contracts processed with e-submission in the sample
	Take-up of e-procurement by cross-border Economic Operators in volume	Total number of contracts processed with e-submission and won by cross-border Economic Operators in the EU as % of total number of contracts in the EU	Total number of contracts processed with e-submission and won by cross-border Economic Operators in the sample as % of contracts processed with e-submission in the sample

Source: IDC, 2012

Figure 1 Simulation of top-level indicator of e-Procurement Value Take-up in the EU



Source: IDC, 2012

How the indicator could be commented: The take-up of e-Procurement in the EU has reached 12% of the total value of public procurement. 5 MS have no take-up, while 4 present a higher take-up than the average EU indicator. (Simulation)

3.4. Other Take-up indicators

To provide more depth and understanding to the analysis it would be useful to implement other take-up indicators. The methodological approach allows to design many other take-up indicators with the same approach, if the relative basic indicators are collected.

More specifically, it would be important to measure take-up of e-procurement by type of purchase. The indicator is described below.

3.4.1. Take-up Indicators by Type of Purchase (supplies, services, public works)

These indicators measure the relative share of the number and value of contracts processed with e-Submission by type of purchase (supplies, services and public works), as explained below and illustrated in Table 9.

- **Basic indicators at platform level:** absolute number and value of contracts processed with and without e-Submission for supplies, or services, or public works. Breakdown % of total contracts processed with e-submission by type of purchase.
- **Synthetic sub-indicators of take-up by type of purchase at MS level:** this indicator is measured through the aggregation of the basic indicators for all the platforms in the country sample. The synthetic indicator is a breakdown % of the total number and value of contracts awarded with e-Submission for supplies, services, or public works by the sample at MS level.
- **Top-level sub-indicator of take-up by type of purchase at EU level**: this indicator is a breakdown % of the total number and value of contracts awarded with e-Submission for supplies, services, or public works, for all of the EU. This is calculated as the average of the MS indicators, or, if not all the MS indicators are feasible, as an extrapolation of the sample data and existing data at the EU level.
- **Scale of Measurement:** The Synthetic indicators are measured in %, as % shares by type of purchase of the total contracts processed with e-Submission at the MS level and at the EU level.
- **Value added:** The field research has shown that e-Procurement take-up is different by type of purchase, and used more often for supplies and services rather than public works. This indicator provides information about the intensity of use of e-Procurement by type of purchase and will help to track in time if the situation changes.

Table 9: Summary of Take-up Indicators by Type of Purchase - EU (green cells represent indicators feasible in the short term)

Take-up Indicators by type of purchase - EU			
Policy Goal	**Indicators**	**Measurement / Ideal indicator**	**Measurement / Sample indicator**
Full transition to e-Procurement / by type of purchase	Take-up of e-procurement by type of purchase - in value	Breakdown of total value of contracts processed with e-submission in the EU by type of purchase	Breakdown of total value of contracts processed with e-submission by the sample by type of purchase
	Take-up of e-procurement by type of purchase- in volume	Breakdown of total number of contracts processed with e-submission in the EU by type of purchase	Breakdown of total number of contracts processed with e-submission by the sample by type of purchase

Source: IDC 2012

3.5. Data Collection Issues

To implement these indicators, the minimum data, which must be collected at platform level, is the following (summarised in Table 10)

- Number and value of contracts processed and awarded during the reference period (e.g. the financial year, or the last calendar year) segmented as follows:
    - By e-procurement service used (specifically, e-submission)
    - By type of purchase (supplies, services, public works), with or without e-Submission;
    - By type of supplier (large enterprise, SMEs, Cross-border Economic Operators), with or without e-Submission;

However, it would be important to collect also the following data:

- Number and value of contracts processed and awarded during the reference period (e.g. the financial year, or the last solar year) segmented as follows:
    - By type of procedure (open, restricted, framework contract...);
    - By electronic procedure (e-Auction, DPS, e-marketplace);

For each of the main groups of indicators we wish to divide the contracts processed with e-Submission from those processed without e-Submission, based on our definition of e-procurement.

Table 11 summarizes the data collection needs, which cannot be sourced from the platforms survey and would be needed from national authorities or Eurostat.

In order to collect the data in a comparable and coherent way, and to allow for aggregation and elaboration, it will be necessary to develop standard definitions of all the basic units of measurement. This is being done as part of the Guidelines to the proof of concept trial and will include for example definitions of the following items:

- What should be counted as a single contract (clarifying for example how to count the subdivisions of contracts in lots, or the renewals of existing contracts)? Ideally, each contract should have a unique identification number, to avoid double counting when elaborating the total number of contracts processed by a platform.
- What is the value of a contract (that should be the final value once the contract is awarded, not the bidding price threshold)? For example the case of Framework Agreements is different, since there may be no predefined value, or only a maximum budget, which may or may not be spent. Within this study, we plan to count only the value of the contracts stipulated within Framework Agreements (not the maximum theoretical budget of the FA).
- How to classify Economic Operators as SMEs and cross-border and what should count as a single supplier at the country and EU level (what about branches of multinational companies?).

The finalisation and validation of the definitions for the data collection will be a primary objective of the trial with the sample of e-PEs.

Table 10 Data collection needs for Take-up indicators - minimum data needed from platforms

Basic Indicator By Platform - related to the reference measurement period (1 year)	Source
Total Number of Contracts awarded by platform	Platforms
Total Number of Contracts awarded by platform with e-Submission	Platforms
Total Value of Contracts awarded by platform	Platforms
Total Value of Contracts awarded by platform with e-Submission	Platforms
Total Number of Contracts awarded to SMEs by platform	Platforms
Total Number of Contracts awarded with e-Submission to SMEs by platform	Platforms
Total Value of Contracts awarded to SMEs by platform	Platforms
Total Value of Contracts awarded with e-Submission to SMEs by platform	Platforms
Total Number of Contracts awarded to cross-border Economic Operators by platform	Platforms
Total Number of Contracts awarded with e-Submission to cross-border Economic Operators by platform	Platforms
Total Value of Contracts awarded to cross-border Economic Operators by platform	Platforms
Total Value of Contracts awarded with e-Submission to cross-border Economic Operators by platform	Platforms

Total number of contracts awarded by type of purchase (supplies, services, public works)	Platforms
Total value of contracts awarded by type of purchase (supplies, services, public works)	Platforms
Total number of contracts awarded with e-submission by type of purchase (supplies, services, public works)	Platforms
Total value of contracts awarded with e-submission by type of purchase (supplies, services, public works)	Platforms
Total number of contracts awarded by type of procedure (Framework contracts, DPS, Open and negotiated procedures)	Platforms
Total value of contracts awarded by type of procedure (Framework contracts, DPS, Open and negotiated procedures)	Platforms
Total number of contracts awarded with e-submission by type of procedure (Framework contracts, DPS, Open and negotiated procedures)	Platforms
Total value of contracts awarded with e-submission by type of procedure (Framework contracts, DPS, Open and negotiated procedures)	Platforms
Total number of contracts awarded above/below the EU threshold	Platforms
Total value of contracts awarded above/below the EU threshold	Platforms
Total number of contracts awarded with e-submission above/below the EU threshold	Platforms
Total value of contracts awarded with e-submission above/below the EU threshold	Platforms

Source: IDC, 2012

Table 11 Additional Data collection needs for Take-up indicators – Data needed from MS or Eurostat

Type of data – related to the reference measurement period (1 year)	Possible Source	Data collection
Total number of public procurement contracts awarded – by MS and at EU level	MS and/or Eurostat	TBD
Total value of public procurement contracts awarded – by MS and at EU level	MS and/or Eurostat	TBD
Total number of public procurement contracts awarded to SMEs – by MS and at EU level	MS and/or Eurostat	TBD
Total value of public procurement contracts awarded to SMEs – by MS and at EU level	MS and/or Eurostat	TBD
Total number of public procurement contracts awarded to cross-border Economic Operators – by MS and at EU level	MS and/or Eurostat	TBD
Total value of public procurement contracts awarded to cross-border Economic Operators – by MS and at EU level	MS and/or Eurostat	TBD
Total number of public procurement contracts awarded by type of purchase (supplies, services, public works) – by MS and at EU level	MS and/or Eurostat	TBD
Total value of public procurement contracts awarded by type of purchase (supplies, services, public works – by MS and at EU level	MS and/or Eurostat	TBD

Source: IDC, 2012

3.6. Evolution of the Take-up Indicators

The indicator on take-up of e-procurement as a percentage of total public procurement should become eventually obsolete when all procurement will have migrated to electronic systems. However, the take-up indicators should be able to evolve and maintain their value added for the following reasons:

- The general take-up indicators can transform to indicators measuring public spending, since the data collected concerns the absolute number of public contracts and their value. This data will remain useful and relevant, as there will always be a need for monitoring public spending;
- The indicators on take-up by SMEs Economic Operators and cross-border Economic Operators will never achieve 100% and there will always be a need to measure them, until the policy measures they monitor will remain valid;
- As the quality of data collection improves and becomes easier, it will be possible to add more specific indicators with the same methodology, to monitor the main flows of public spending, for example by type of purchase, by procedure, by sector and so on.

4. PERFORMANCE AND BENEFITS INDICATORS

4.1. Overview

The design of the indicators of performance and benefits achieved through e-Procurement is particularly complex, because of the wide range of possible KPIs and measurement methods. These indicators should be linked to existing good practices, which can provide quali-quantitative benchmarks and priority criteria for their selection.

The following selection of indicators is based on the main drivers of e-Procurement identified in the study, and will be discussed and revised not only with the Panel and the EC, but also with the PwC team developing the Golden Book of e-Procurement good practices.

The development of performance indicators requires the definition of evaluation criteria, guiding the assessment of “good” or “insufficient” performance. This means defining a “vision” of the ideal performance to be pursued, and developing appropriate benchmarks to measure performance. The vision and the evaluation criteria should be technology neutral and flexible enough to allow for the variety of business models and implementation pathways chosen by the 27EU in their evolution towards e-Procurement. If the evaluation criteria are not explicit and transparent, they risk to be implicit and hidden, which would create a risk of manipulation and unbalanced assessment in the monitoring system. Here we have tried to make explicit the criteria of evaluation, but there is a need for further input and analysis.

The validation of the selection of performance indicators and the development of the evaluation and benchmarking criteria indicated above should be among the main objectives of the trial of indicators.

The performance indicators will be developed with the same methodology as the take-up indicator and will present some of the similar problems, specifically general lack of data about traditional procurement performance, which makes it difficult to calculate improvements from paper-based to electronic procurement (see also par. 3.1). The platforms of the sample cannot in fact provide data on traditional procurement performance.

As for the take-up indicators, therefore, we have identified two types of indicators:

- "ideal indicators" which are based on the comparison of performance and benefits between traditional and electronic procurement, if we can find comparable data;
- "sample indicators" which measure performance and benefits on the basis of the sample of platforms providing the basic data.

The following paragraphs present the indicators in detail and explain to what extent we can implement the "ideal indicators". However, also "sample" performance indicators represent considerable progress from the current situation, by providing information based on a comparable, EU-wide sample of platforms with a systematic and coherent methodology.

4.2. Description of the indicators

The performance and benefits indicator respond to the following main policy goals.

Policy Goal: The main policy goal is to provide the evidence of benefits resulting from the adoption of e-Procurement, increasing awareness and ultimately contributing to the full implementation of e-Procurement.

More specifically, we have focused on the following specific policy goals:

Specific policy goals and indicators:

- **Improve the cost-effectiveness of public spending.** This will be measured through two main indicators:
    - **E-Submission Price reduction Indicator**, measuring the reduction of prices (compared to the maximum price foreseen, the reserve price) for contracts awarded with e-Submission;
    - **E-Submission Frequency of litigation indicator**, measuring the reduction of the number of appeals, therefore of litigation, for the contracts awarded with e-Submission.
- **Improve the efficiency of the public procurement process**, thanks to the time saved and higher productivity achieved through e-Procurement. This will be measured through two main indicators:
    - **Efficiency in e-tendering for Contracting Authorities**, corresponding to the average time needed by a CA to prepare and implement an e-Tendering process in the pre-award phase;
    - **Efficiency in e-tendering for Economic Operators**, corresponding to the average time needed by a supplier to prepare and send an electronic Tender.
- Improve the **usability and ease of access** of e-Procurement services, as a precondition for higher take-up and participation. This will be measured through:
    - **E-Submission ease of access indicator** measured through the level of authentication requirements (from simplified eID to advanced e-Signatures). The assumption is that simplified eID is easier to use.
- **Improve the transparency of the public procurement process**, which in turn is a key element to reduce corruption, cronyism and improve fairness and equal opportunities of participation by small and/or foreign Economic Operators. This will be measured through the following:
    - **Transparency Indicator** based on the assessment of the completeness and quality of the information provided to buyers and Economic Operators on the

platform about the use of its main services for the pre-award phase. This indicator cannot be measured with an absolute value, but will have to be based on a qualitative assessment (high-medium-low-none) at the platform level, which will then be scaled up to the country and EU level. This definition of transparency is focused on the core business of the entities of the panel, the e-Procurement activities.

Summary of Top Level Performance indicators (Table 12): The following table presents a summary of the Top-level Performance Indicators, which will be measured at the EU level. The measurement process is illustrated below. The table is structured as follows:

- In the first column the policy goal to be measured
- In the second column the name of the indicator
- In the third column the description of the ideal indicator and its measurement, in case there is sufficient data about the market to be used as denominator or benchmark (for example about traditional procurement)
- In the last column the same indicator as measured only on the basis of the data collected from the measurement panel, which is a sample of e-Procurement entities.

Another possible indicator concerns the average number of bidders per contract tender. There are however some perplexities about its significance: how to decide whether the average number of bidders is high or low; when it grows or decreases, does it mean that there is greater choice or that there is better information so only the best-suited economic operators respond? According to our Advisory Panel, both have been known to happen. In any case, the data will be collected and the potential indicator will be verified.

Table 12: Summary of Top-level Performance Indicators – EU (Green cells show the indicators which are feasible in the short term)

Top-Level Performance Indicators - EU			
Policy Goal	**Indicators**	**Measurement / Ideal indicator**	**Measurement / Sample indicator**
Improve effectiveness of public spending	E-Submission Price Reduction* Indicator	Average price reduction of e-Submission contracts compared to traditional procurement contracts (ratio %)	Average Price Reduction of e-Submission contracts in the sample (% on reserve price)
	E-Submission Reduction of Litigation indicator	Average reduction of litigation for e-Submission contracts compared to traditional procurement contracts (% ratio)	Average frequency of litigation for e-Submission contracts in the sample (average number of appeals)
Improve efficiency of procurement processes	E-Tendering Efficiency Improvement indicator for Contracting Authorities	Average time saved by CAs in implementing e-Tendering versus traditional procurement pre-award process (measured as a % ratio)	Average time employed by CAs in implementing e-Tendering (hours) in the sample

	E-Tendering Efficiency Improvement indicator for Economic Operators	Average time saved by Economic Operators in implementing e-Tendering versus traditional procurement pre-award process (measured as a % ratio)	Average time employed by Economic Operators in implementing e-Tendering (hours) in the sample
Improve usability / ease of access of public procurement	E-Submission Ease of access indicator	Not applicable	High-Medium-Low ease of access to e-Submission, measured through the type of authentication requirements (from simplified eID to advanced e-Signatures). - in the sample
Improve transparency of public procurement	Transparency Indicator of e-procurement for buyers and Economic Operators	Not applicable	High-Medium-Low-Transparency indicator, measured through the quality and completeness of information

Source: IDC 2012

*Price Reduction: Difference between the reserve price (the maximum payment allowed for the contract) and the award price of a contract

4.2.1. Effectiveness Indicators - Price Reduction

The following tables present the e-Submission Price Reduction Indicators and benchmarks, their measurement approach and a visualization of the way they could be presented, based on simulated data. This includes a short statement about the meaning of each indicator.

More specifically:

- **The average price reduction indicator measures the difference between the reserve price** (the maximum payment allowed for the contract) **and the award price of a contract**, on average for all the contracts processed with e-submission by the sample of platforms. This is calculated at country and EU level.
- **Measurement scale**: The measurement scale is a percentage of the award price over the maximum possible price. For example, if the maximum possible price of a contract is 250K euro, and the winner is awarded the contract at 220K euro, the price reduction is calculated at 12% (the algorithm is ((220/250)-1). (Figure 1).
- **Aggregation**. The price reductions are aggregated at platform level and then at country level, by calculating their average. The averages will be corrected with weights, if appropriate, to take into account variations of typology and size of platform, typology and total value of contracts, size of the country. The exact algorithms will be defined in the phase of elaboration of the data collected and will be clearly justified.
- **The price reduction indicator for e-Submission vs. traditional procurement** measures the difference between the average reduction price for contracts processed with e-submission and the average reduction price for contracts

processed with traditional procurement methods. This will be calculated at the country level and EU level, if it will be possible to collect comparable average reduction price data for traditional procurement contracts (Figure 2).

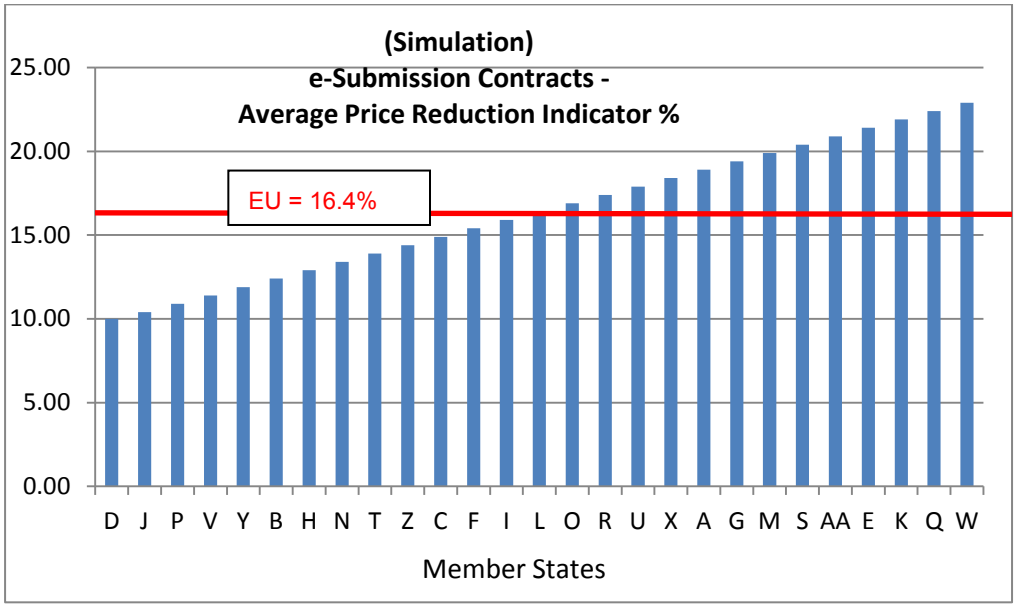
- **The price reduction indicators for e-Submission vs traditional procurement at MS level** can be classified as high, medium or low performance, compared to the same indicator at EU level. In other words, if we assume that public contracts processed with e-Submission in the EU are awarded with prices 13% lower on average than contracts processed through traditional procurement (simulated data), all the MS with higher price reduction indicators will be classified as high performance. Similarly, the MS with lower price reductions than the EU benchmark will be classified as low performance, while those with price reductions close to the average EU indicator as medium performance (Figure 2).

Table 13: Top-level Performance Indicators - Effectiveness - Price Reduction

Top-Level and Synthetic Performance Indicators - Price Reduction				
Indicator	**Measurement**	**Scope**	**Benchmarking value / Traditional Public Procurement**	**Benchmarking value / Best in Breed**
Average Price Reduction Indicator	Average price reduction* of all contracts awarded with e-submission (%)	Per each MS EU level		
Price Reduction Indicator of e-Submission vs traditional procurement	Average price reduction of e-submission contracts compared with average price reduction of traditional procurement contracts	Per each MS EU level	Average price reduction* of all contracts awarded with traditional Public Procurement (%)	Highest average price discount within the sample, or identified by GoldenBook
Member States classification - High, Medium, Low Price reduction of e-Submission vs traditional procurement	High = Average MS Price reduction higher than average EU price reduction Medium = Average MS Price reduction close to EU price reduction Low = Average MS Price reduction lower than EU Price reduction	Per each MS		Average Price reduction at EU level

Source: IDC 2012 - Price Reduction: Difference between the reserve price (the maximum payment allowed for the contract) and the award price of a contract

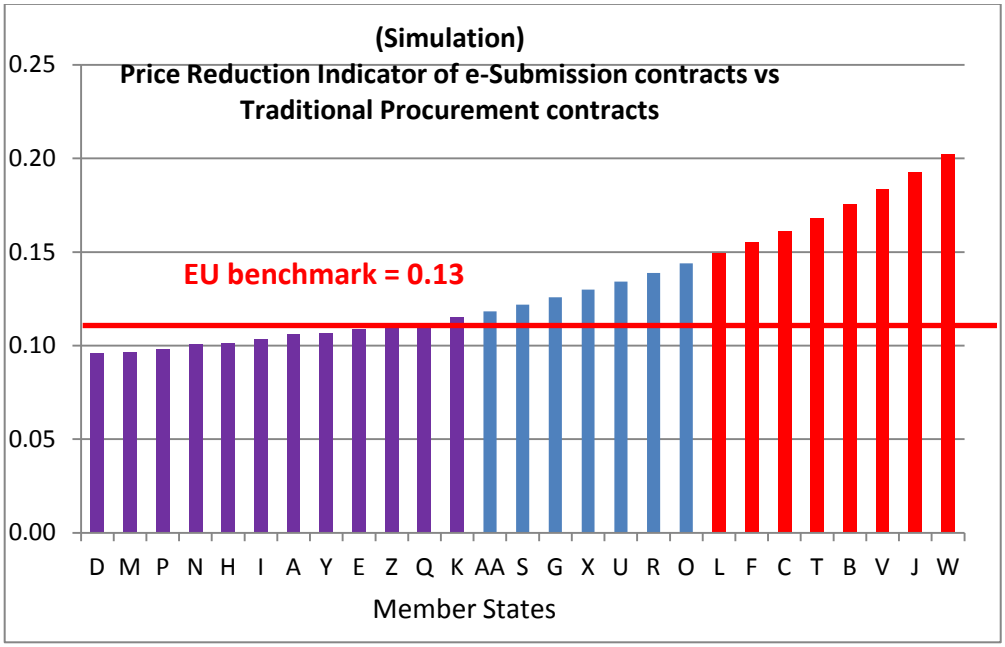
Figure 2 Effectiveness - e-Submission Average Price Reduction Indicator



Source: IDC 2012

***How it could be commented**: Public Contracts processed with e-Submission in the EU are awarded with an average price reduction over the reserve price of 16.4%. The range of average price reductions per Member State varies from 10% for the worse performers to 22.9% for the best performers.*

Figure 3 Effectiveness - Price Reduction Indicator of e-Submission vs traditional procurement contracts



Source: IDC 2012

Legenda = High Price Reduction; Medium Price Reduction; Low Price Reduction

0 = the Price reduction of contracts with e-Submission is equal to that of contracts with traditional procurement

***How it could be commented**: Public Contracts processed with e-Submission in the EU are awarded with prices 13% lower on average*

than contracts processed through traditional procurement. The range of average price reductions per MS varies from + 10% to +20% for the best performers (simulation data).

4.2.2. Effectiveness Indicators - Reduction of Litigation

The following tables present the e-Submission Frequency of Litigation and Reduction of Litigation Indicators, the measurement approach and a visualization of the way they could be presented, based on simulated data. This includes a short statement about the meaning of each indicator. Currently few Member States do measure litigation. The availability of information on litigation at country level should be encouraged in order to enable the measurement of such an indicator.

More specifically:

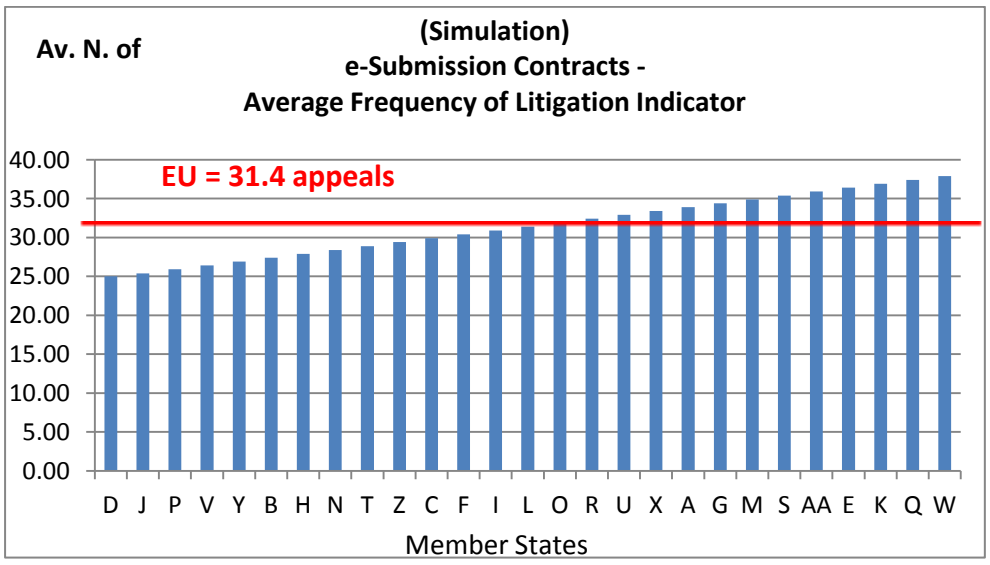
- **The average Frequency of litigation indicator measures the average number of appeals per year for all contracts awarded with e-submission (Number).** This is calculated as averages at country and EU level (Figure 4).
- **Aggregation**. The frequency indicators (average numbers of appeals) will be aggregated at platform level and then at country and EU level, by calculating their average. The averages will be corrected with weights, if appropriate, to take into account variations of typology and size of platform, typology and total value of contracts, size of the country. The exact algorithms will be defined in the phase of elaboration of the data collected and will be clearly justified.
- **The average reduction of litigation indicator measures the difference** between the average frequency of appeals (litigation) for contracts processed with e-submission and the same data for contracts processed with traditional procurement methods. This will be calculated at the country level and EU level, if it will be possible to collect comparable data for traditional procurement contracts (Figure 5).
- **Measurement scale**: The frequency indicator is measured in absolute numbers (of appeals). The reduction of frequency of litigation is a % ratio.
- **The average reduction of litigation indicators per Member State** will be classified as high, medium or low performance, compared to the EU indicator. In other words, assume that public contracts processed with e-Submission in the EU have a minus 55% frequency of appeals than the contracts processed through traditional procurement (*simulated data*). In this case, all the MS with higher litigation reduction indicators will be classified as high performance, those with lower litigation reduction indicators than the EU benchmark as low performance, those with litigation reduction indicators close to the average EU level as medium performance. (Figure 5).

Table 14: Top-level Performance Indicators - Effectiveness - Reduction of Frequency of Litigation

Top-Level and Synthetic Performance Indicators - Frequency and Reduction of Litigation				
Indicator	**Measurement**	**Scope**	**Benchmarking value / Traditional Public Procurement**	**Benchmarking value / Best in Breed**
Average Frequency of Litigation Indicator - e-Submission	Average number of appeals per year for all contracts awarded with e-submission (Number)	Per each MS EU level		
Reduction of Litigation Indicator - e-Submission	Reduction of frequency of litigation for e-submission contracts compared to contracts awarded with traditional procurement (% ratio)	Per each MS EU level	Average frequency of litigation for all contracts awarded with traditional Public Procurement (Number of appeals)	Average number of appeals of all contracts awarded with e-Submission within the sample, or identified by GoldenBook
Member States classification - High, Medium, Low Reduction of Litigation	High Reduction of Litigation = Average Reduction of litigation higher than EU average reduction Medium = Average Reduction of litigation close to EU average reduction Low = Average Reduction of litigation lower than EU average reduction	Per each MS		

Source: IDC 2012

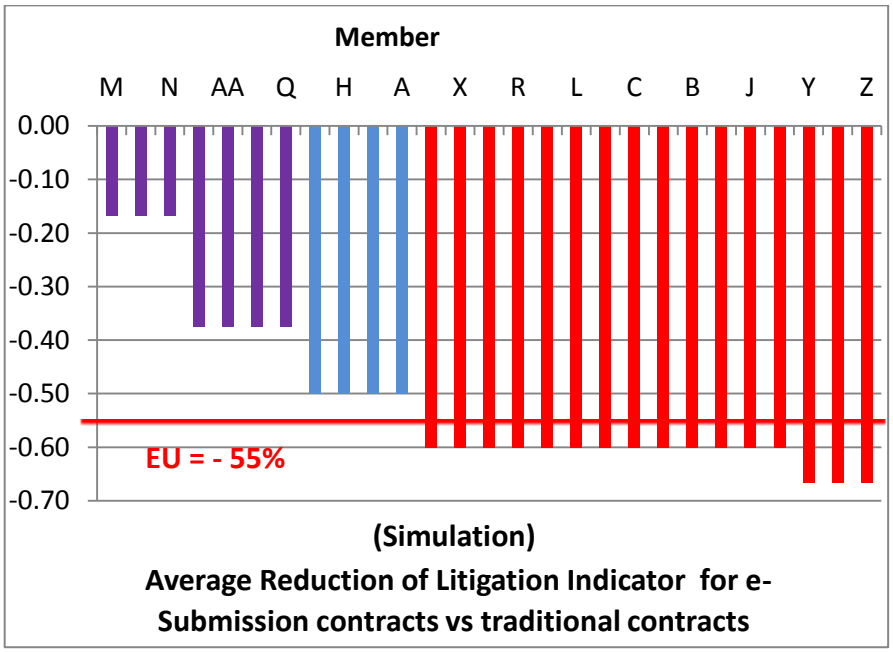
Figure 4 Effectiveness - Average Frequency of Litigation Indicator - e-Submission contracts



Source: IDC 2012

***How it could be commented**: The average number of litigation appeals for the Public Contracts processed with e-Submission in the EU was 31.4 per year. The range of litigations per Member State varies from 25 per year for the best performer to 37.9 for the worst performer (Simulated data).*

Figure 5 Effectiveness - e-Submission Average Frequency of Litigation Benchmark



Legenda = High Reduction of Litigation; Medium Reduction of Litigation; Low Reduction of Litigation

0 = the frequency of litigation of contracts with e-Submission is equal to that of contracts with traditional procurement

***How it could be commented**: The frequency of litigation for Public Contracts processed with e-Submission in the EU is 55% lower compared to the frequency of litigation of contracts processed with traditional procurement. The range of litigation reduction per MS varies from - 17% to -67% for the best performers (simulated data).*

4.2.3. Efficiency Indicators

E-Procurement will deliver major efficiency benefits, including time, cost savings and productivity gains in the implementation of the procurement process. These benefits are extremely difficult to measure, because clear and comparable comparisons between the traditional process and the e-Procurement process are almost impossible to find at the level of granularity, which would be needed for this indicator system. Moreover, the Advisory Panel members have underlined that they do not generally have these data first hand, because they are intermediaries.

Therefore, we have designed these indicators on the basis of the data which can be collected by the platforms. The following tables present the Efficiency Indicator and benchmark, the measurement approach and a visualization of the way they could be presented, based on simulated data. This includes a short statement about the meaning of each indicator.

More specifically:

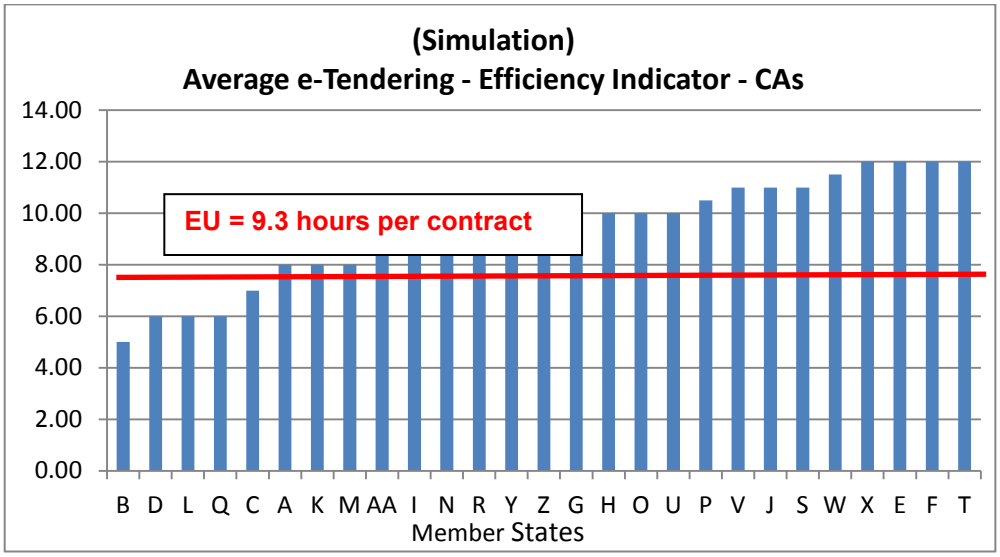
- **The average efficiency indicator measures the** average time spent to prepare and process a tender in the pre-award phase (man-days or hours) by Contracting Authorities and separately by Economic Operators. This is calculated as averages at country and EU level. (Figure 5).
- **Measurement scale**. The average efficiency indicator will be calculated in hours (or man-days) whatever is more practical.
- **Aggregation**. The efficiency indicators (average time to complete the tasks of e-Tendering) will be aggregated at platform level and then at country and EU level, by calculating their average. The averages will be corrected with weights, if appropriate, to take into account variations of typology and size of platform, typology and total value of contracts, size of the country. The exact algorithms will be defined in the phase of elaboration of the data collected and will be clearly justified.
- **Aggregation only at the EU level**. If the data collected is insufficient to calculate the indicator for all the EU27, the efficiency indicator can be aggregated for all the platforms of the sample and extrapolated to calculate an EU average indicator only.
- **The e-Tendering Efficiency Improvement indicator measures the difference** (% ratio) between the average time spent by CAs or Economic Operators in the e-Tendering phase and the average time spent in the pre-award phase by CAs or Economic Operators in the traditional procurement process. This ratio will be measured at the country level and EU level, if it will be possible to collect comparable data for traditional procurement contracts.
- **Measurement scale** This indicator is a % ratio between two time values.
- **Aggregation of the indicators only at EU level.** If the data collected is insufficient to calculate the improvement indicator for all the EU27, the indicator can be aggregated for all the platforms of the sample and extrapolated to calculate an EU efficiency improvement indicator only.
- **The average efficiency improvement indicators per Member State will be classified as high, medium or low performance**, considering as benchmarking value the EU indicator (% ratio). In other words, let us assume that at the EU level, CA save on average 2 hours when moving from the traditional to the e-tendering process, corresponding to 20% of the traditional process time (*simulated data*). In this case, all the MS with higher time savings than the EU indicator of 20% will be classified as high performance, those with lower time savings than the EU benchmark as low performance, those with time savings close to the average EU level as medium performance.

Table 15: Top-level and Synthetic Performance Indicators - Efficiency in e-Tendering

Top-Level and Synthetic Performance Indicators - e-Tendering Efficiency				
Indicator	**Measurement**	**Scope**	**Benchmarking value / Traditional Public Procurement**	**Benchmarking value / Best in Breed**
Average e-Tendering Efficiency Indicator/ CA	Average time spent to implement e-Tendering (mandays or hours)	Per each MS EU level		
Average e-Tendering Efficiency Indicator/ Supplier	Average time spent to implement e-Tendering (mandays or hours)	Per each MS EU level		
E-Tendering Efficiency Improvement Indicator/ CA	Average time saved by CAs in implementing e-Tendering versus average time spent implementing the pre-award phase with traditional process (% ratio)	Per each MS EU level	Average time spent by CA for pre-award with traditional process (hours or mandays)	Shortest time spent by CA for e-Tendering within the sample, or identified by GoldenBook (hours or mandays)
Average e-Tendering Efficiency Improvement Indicator/ Supplier	Average time saved by Economic Operators in implementing e-Tendering versus average time spent implementing the pre-award phase with traditional process (% ratio)	Per each MS EU level	Average time spent by Economic Operators for pre-award with traditional process (hours or mandays)	Shortest time spent by Economic Operators for e-Tendering within the sample, or identified by GoldenBook
MS Classification - High, Medium, Low e-Tendering Efficiency Improvement	High efficiency = Average time saved by CAs or Economic Operators for e-Tendering lower than average time saved at EU level Medium efficiency = Average time saved by CAs (or Economic Operators) for e-Tendering close to average time saved at EU level Low efficiency = Average time saved by CAs (or Economic Operators) for e-Tendering higher than average time saved at EU level	Per each MS		

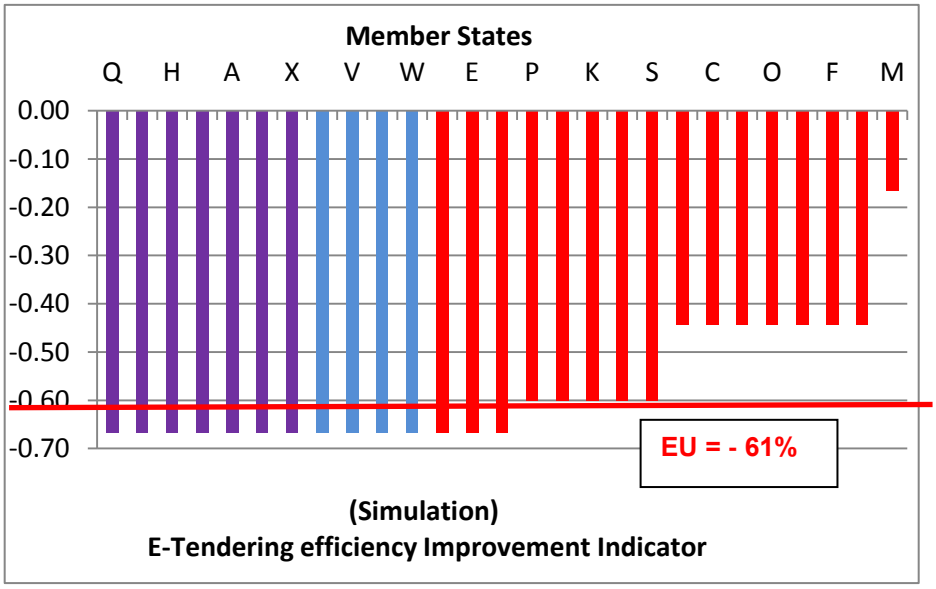
Source: IDC 2012

Figure 6 Average e-Tendering Efficiency Indicator - CAs



***How it could be commented**: The average time spent by CAs to implement e-Tendering at EU level is 9.3 hours. The same indicator per MS varies from 5 hours for the best performer to 12 hours for the worst performer (Simulated data).*

Figure 7 E-Tendering Efficiency Improvement Indicator - CAs



Legenda = High Efficiency (= high time saved); Medium Efficiency (medium time saved); Low Efficiency (low time saved)

0 = the average time spent by CAs implementing e-Tendering is equal to the average time spent by CAs in the pre-award phase in traditional public procurement processes.

***How it could be commented**: The average time spent by CAs when implementing pre-award in traditional public procurement is 23.8 hours (simulated data). The average time saved by CAs when implementing e-Tendering is 14.5 hours, corresponding to 61% of time saved compared to the traditional procurement process. The efficiency benchmark for*

CAs varies at MS level from -17% for the least efficient MS to -67% for the most efficient MS (simulated data).

4.2.4. E-Submission Ease of Access Indicator

The simplification and ease of use of the e-Procurement process has been indicated as one of the main drivers of the transition from traditional procurement processes. It is not easy to assess usability with a benchmarking methodology, since usability is normally a function of a customer-oriented service approach. However, we have selected one indicator focused on the ease of use of the methods of authentication required by the platforms, which is one of the most critical aspects of e-Procurement usability.

The following tables present the Transparency Indicator and benchmark, the measurement approach and a visualization of the way they could be presented, based on simulated data. This includes a short statement about the meaning of each indicator.

More specifically:

- **The E-Submission Ease of Access indicator measures the level of ease of access to e-Submission services measured through the type of electronic authentication required**. This indicator cannot be measured with an absolute value, but is based on a semantic scale corresponding to a rising scale of authentication requirements.
- **Measurement scale**: in the suggested semantic scale each value corresponds to a score and is indicatively defined as follows:
    - Very High = VH = score 5 = No authentication requirements
    - High = H = score 4 = Request of simplified eID (username and password) very easy to have
    - Medium = M = score 3 = Request of simplified eID (username and password) based on a request process of low difficulty
    - Low = L = score 2 = Request of qualified or advanced e-Signatures based on a request process of low difficulty
    - Very low = VL = score 1 = Request of qualified or advanced signatures with complex process of acquirement, or of more complex, country-based qualification methods
- **Measurement approach:** the study team has prepared and validated with the Panel participants the above definition of the authentication requirements corresponding to the 5 levels of the semantic scale. These definitions will be operationalised and further validated during the trial. The panel participants will classify themselves based on these definitions, but the study team will carry out cross-checks and validations of their self-classification by verifying the information on the platforms websites.
- **Aggregation**. The scores will be used to aggregate the results of each platform at country level and at EU level, by calculating their average. The averages will be corrected with weights, if appropriate, to take into account variations of typology and size

of platform, typology and total value of contracts, size of the country. The exact algorithms will be defined in the phase of elaboration of the data collected and will be clearly justified.

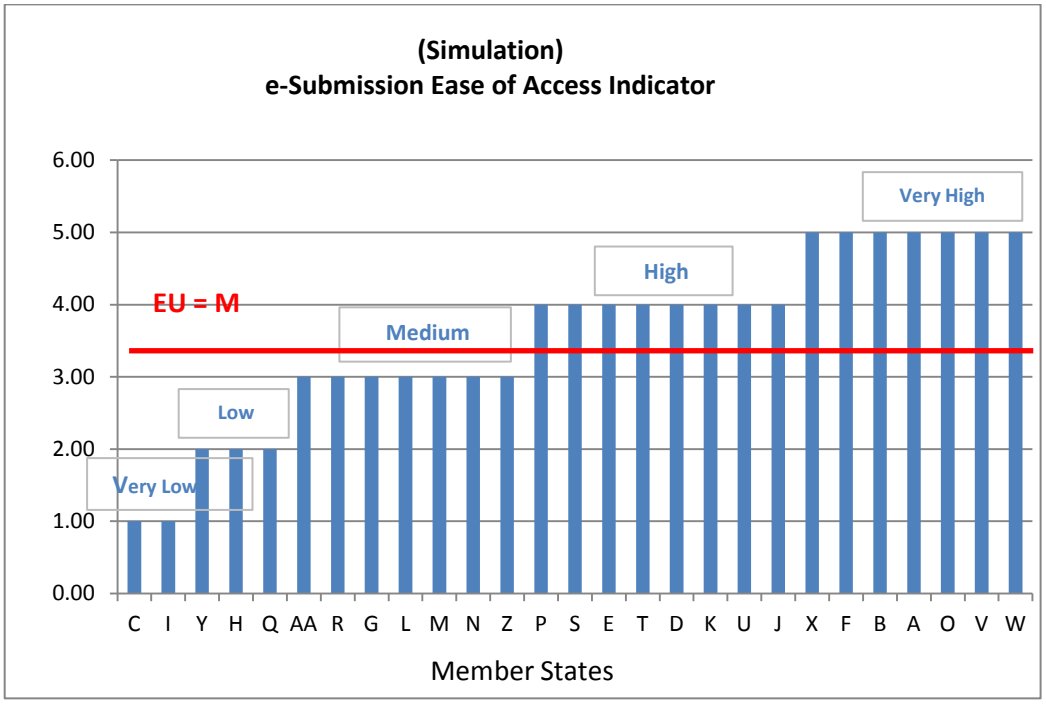
- **Aggregation of the indicator only at EU level.** If the data collected is insufficient to calculate the indicator for all the EU27, the ease of access indicator can be aggregated for all the platforms of the sample and extrapolated to calculate an EU average indicator only.
- **The Ease of access indicators per MS** are already in a scale from Very High to Very Low so the relative positioning of each MS compared to the EU benchmark indicator will be immediate.
- **Modulation of the Ease of access indicator:** If so desired, the indicator can be measured for specific categories of stakeholders (namely, cross-border Economic Operators) or for different services (for example, e-Notification, or the whole pre-award phase) by measuring the indicator for each phase and aggregating the results based on the scores. For the sake of simplicity we suggest to start with the e-Submission indicator only.

Table 16: Top-level Performance and Synthetic Indicators - e-Submission Ease of Access

Top-Level and Synthetic Performance Indicators - e-Submission Ease of Access				
Indicator	**Measurement**	**Scope**	**Measurement Scale**	**Benchmarking value / Best in Breed**
e-Submission Ease of Access Indicator	Level of ease of access to e-Submission services measured through the type of electronic authentication required	Per each MS EU level	Very High High Medium Low Very low	Highest level of ease of access within the sample, or identified by GoldenBook (same semantic scale)
Member States classification	From VH to VL based on the measurement scale	Per each MS		

Source: IDC 2012

Figure 8 E-Submission: Ease of Access Indicator



Source: IDC, 2012

***How it could be commented**: The e-Submission Ease of Access indicator at EU level corresponds to a Medium-to High level on a scale from very low to very high ease of access. The Ease of access indicator per MS has a wide range of variation: 12 MS are below the EU benchmark while the other 15 are above (Simulated data).*

4.2.5. Transparency Indicators

The following tables present the Transparency Indicator and benchmark, the measurement approach and a visualization of the way they could be presented, based on simulated data. This includes a short statement about the meaning of each indicator (Figure 9).

More specifically:

- **The Transparency indicator measures the level of transparency of the information provided to buyers and Economic Operators** by the main e-Procurement entities analyzed about the use of their main services. This indicator cannot be measured with an absolute value, but will have to be based on an assessment of the level of quality and completeness of the information provided at the platform level, which will then be scaled up to the country and EU level;
- **Measurement scale**: the transparency indicator will be measured through a semantic scale where each value corresponds to a score as follows:
    - Very High = VH = score 5 (excellent quality)
    - High = H = score 4 (good quality)
    - Medium = M = score 3 (sufficient quality)
    - Low = L = score 2 (poor quality)
    - Very low = VL = score 1 (insufficient quality)

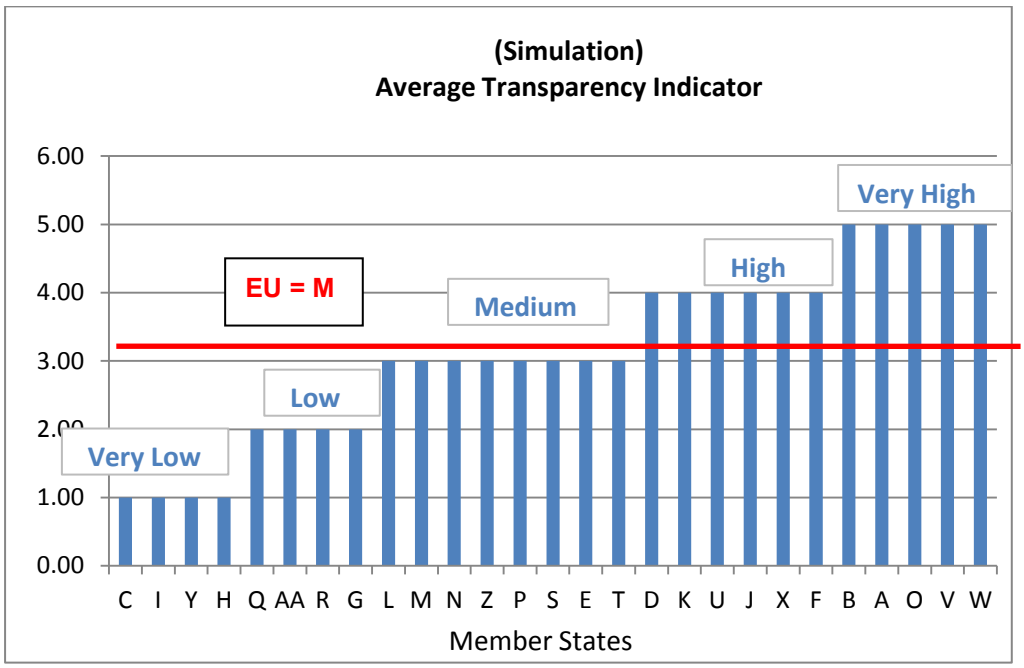
- **Measurement approach**: the study team will prepare and validate with the trial a list of the type of information (information packages) which should correspond to the 5 levels of the semantic scale, from very low to very high transparency. This will be based on the quality and completeness of the information needed to insure full transparency. The definition of the information package will include items such as: presence of buyers and vendors guidelines and FAQs; level of detail and completeness of the guidelines and FAQs; presence of help services, including complaint and requests for clarification mechanisms and so on; level of disclosure of the identity of participating bidders and of the selected contractor, depending on the phase of the process. The information package will be presented as a check list to be compiled by platform managers, confirming which type of information they offer. The benchmarking organization will carry out cross-checks and validations of their answers by verifying the information on the platforms websites. The validation of the information package will be an objective of the trial.
- **Aggregation**. The scores will be used to aggregate the results of each platform at country level and at EU level, by calculating their average. The averages will be corrected with weights, if appropriate, to take into account variations of typology and size of platform, typology and total value of contracts, size of the country. The exact algorithms will be defined in the phase of elaboration of the data collected and will be clearly justified.
- **Aggregation of the benchmark only at EU level.** If the data collected is insufficient to calculate the indicator for all the EU27, the transparency benchmark can be aggregated for all the platforms of the sample and extrapolated to calculate an EU average benchmark only.
- **The Transparency benchmarks per country** are already in a scale from Very High to Very Low so the relative positioning of each MS compare to the EU benchmark will be immediate.

Table 17: Top-level Performance Indicators - Transparency

Top-Level and Synthetic Performance Indicators - Transparency Indicator				
Indicator	**Measurement**	**Scope**	**Measurement Scale**	**Benchmarking value / Best in Breed**
Average Transparency Indicator	Average level of transparency of the information provided for buyers and Economic Operators by e-Procurement entities	Per each MS EU level	Very High High Medium Low Very low	Highest level of transparency within the sample, or identified by GoldenBook (semantic scale)
Member States classification	From VH to VL based on the measurement scale	Per each MS		

Source: IDC 2012

Figure 9 Transparency - Average Transparency Indicator



Source: IDC 2012

***How it could be commented**: The average transparency of e-Procurement services at EU level is at a Medium level, which on a scale from very low to very high quality is the minimum necessary for transparency. The transparency indicator per MS varies from very low to very high: 8 MS are under the medium benchmark and 11 MS are over the medium benchmark (Simulated data).*

4.3. Data Collection Issues for Performance indicators

The data collection for the performance indicators is quite challenging. To implement these indicators, the minimum data, which must be collected at platform level, is the following (summarised in Table 18). Additional data is needed in order to compare performances with the traditional procurement process: this is indicatively listed in Table 19.

As for the take-up indicators, the collection of these data will require clear and shared definitions of the main tasks measured by the indicators, more specifically:

- Appropriate benchmarks (best-in-breed, or based on external sources) for the effectiveness indicators and efficiency indicators;
- For the efficiency indicators, clear and shared descriptions of the main tasks involved in the e-Procurement pre-award process for CA and Economic Operators (average time needed to implement these tasks);
- For the transparency indicators, definition of the type and level of information which must be considered as sufficient for transparency (as anticipated in the measurement approach);
- For the ease of access indicator, validation or revision of the suggested scale of assessment of authentication requirements

and specifications of the requirements, on a technology-neutral basis.

Table 18 Data collection needs for Performance indicators - minimum data needed from platforms

Basic Indicator By Platform - related to the reference measurement period (1 year)	Source
Average reserve price and average award price for all the contracts processed by the platform, divided by contracts processed with e-Submission, without e-Submission, with e-Auctions;	Platforms
Average number of appeals per contract processed with e-Submission and per contract processed without e-Submission;	Platforms
Total numbers of Contracting Authorities and Economic Operators registered by the platform;	Platforms
Total number of Contracting Authorities and Economic Operators engaged in e-Submission;	Platforms
Number of Economic Operators bidding for each contract	Platforms
Average time needed by a CA to prepare and implement an e-Tendering process including e-submission, according to the requirements posed by the platform;	Platforms
Average time needed by a supplier to prepare and send an electronic tender according to the requirements posed by the platform;	Platforms
Type of e-authentication required to access the platform and its main services (e-Notification, e-Submission) per type of supplier (domestic vs. cross-border).	Platforms
Type of information provided to Economic Operators and buyers, based on a check list provided by the benchmarking organization	Platforms

Source: IDC, 2012

Table 19 Additional data collection needs for Performance indicators

Type of data	Possible source	Data collection
Average reserve price and average award price for all the public procurement contracts in the MS / across the EU	MS and/or Eurostat	**TBD**
Average number of appeals per contract for all the public procurement contracts in the MS / across the EU	MS and/or Eurostat	**TBD**
Average time needed by a CA to prepare and implement a pre-award process with traditional procurement	MS, independent studies	**TBD**
Average time needed by a supplier to prepare and implement a pre-award process with traditional procurement	MS, independent studies	**TBD**

Source: IDC, 2012

4.4. Evolution of the Performance indicators

The evolution of the performance indicators from the transition phase to a phase of full implementation of e-Procurement is not difficult to envisage. These indicators refer to the achievement of benefits through the e-Procurement process; therefore, there will always be room for improvement in time. A key objective of these indicators is to measure progress in time after the baseline measurement.

All the indicators are measured compared to specific benchmarks; by changing benchmarks, the indicators will automatically change. The structure of the indicators may remain the same, while the benchmarks may evolve in time. If they are “best in breed” benchmarks, they will naturally evolve as the best performers improve in time. If the benchmarks are based on external sources, they can be revised periodically to keep up with new challenges.

Every change in the methodology of the indicators, however, represents a break of continuity in the historical series of indicators and prevents year-on-year progress assessments. Therefore, changes in the methodology (in this case, of the benchmarks) should be implemented sparingly, ideally only every 4/5 years, so that a full measurement cycle can be implemented. This shows that the precise definition of benchmarks in the first, baseline measurement is crucial, in order to start with benchmarks which are challenging, but not impossible to reach.

5. IMPLEMENTATION OF THE INDICATOR SYSTEM

5.1. Overview

The implementation of the indicator system will require the following main steps (partially anticipated in par. 3.1 about take-up indicators):

- **Organization of a panel of EU platforms willing to collaborate with the EC and each other to set up a measurement and monitoring capacity of e-procurement;**
- **Collection of basic data from the sample of platforms and development of basic indicators based on common, clear definitions.**
- **Elaboration of the sample indicators at MS and EU level through**:
    - **Aggregation** of basic level indicators of the sample scaling up to the MS and EU level
    - **Development of estimates** to fill the gaps between the sample data and the market, by calculating the level of representativeness of the sample. This means assessing to what extent the profile of the sample reflects the profile of the total population (by MS and across the EU); and how much of the total e-procurement flow is intercepted by the sample of entities examined.
- **Collection of additional data on traditional public procurement from MS/Eurostat or other sources (if possible)**
- **Calculation of the ideal take-up indicators and performance indicators, combining sample data and traditional public procurement data;**
- **Visualization, presentation and interpretation of the output indicators, performing cross-checks of validity, soundness, reliability, coherence, and value added.**
- **Final presentation and interpretation of the output indicators.**

This is an iterative process, which will be repeated for each cycle of measurement, hopefully improving in time. At the start of each cycle it will be possible to revise and fine-tune the indicators (even if basic revisions of the calculation methods should be implemented with caution, to enable monitoring of progress over time).

The organization of the panel of platforms and the data collection will be tested through a "proof of concept trial" with a sample of platforms, which will lead to the revision of the indicator system (see par.1.2 on next steps).

5.2. Organization of data collection

The main requirements of data collection for take-up indicators and performance indicators have been presented separately in the previous chapters. However, this is not sufficient to implement the system of indicators. To complete the measurement we need to carry out data collection on two other main aspects:

- Availability of the key e-procurement services and electronic procedures: this means to verify if they are offered by the examined platforms
- Classification of the platforms of the sample, based on the Census taxonomy developed by this project[1], in order to compare their profile and positioning to the total population of platforms existing in the EU.

The collection of these data will be used to develop basic indicators. In turn, the basic indicators will be used for the completion and interpretation of take-up and performance indicators, as well as to feed into the estimates for the extrapolation of the sample data to the total market. For example, by cross checking the maturity and sophistication of the offering with the level of take-up and performance, we can identify weak and strong points of national or local e-procurement infrastructure and/or investigate the reasons for variations in take-up.

They are presented briefly in the following paragraphs.

5.2.1. Data collection on Availability

The data collection on availability will focus on the following main measurement areas (illustrated in Table 20 below):

- Availability of Electronic Procedures, including e-Auctions, Electronic Marketplaces, DPS
- Availability of Services in the Pre-Award phase, with specific attention to e-submission
- Availability of Services in the Post-Award phase, with specific attention to e-ordering
- Availability of Infrastructural tools, including e-Certificates and e-Catalogues

Table 20 Data collection needs for availability - minimum data needed from platforms

Measurement area	Variable	Basic Indicator	Source	Data collection
Electronic Procedures	e-Auction	Yes/ No (basic/ advanced)	platforms	survey
	DPS	Yes/ No (basic/ advanced)	platforms	survey
	Electronic marketplace	Yes/ No (basic/ advanced)	platforms	survey
Services offered / Pre-Award	e-Notification	Yes/ No (basic/ advanced)	platforms	survey
	e-Access	Yes/ No (basic/ advanced)	platforms	survey
	e-Submission	Yes/ No (basic/ advanced)	platforms	survey

[1] Presented in deliverable D1 e-Procurement landscape in Europe

	e-Evaluation	Yes/ No (basic/ advanced)	platforms	survey
	e-Awarding	Yes/ No (basic/ advanced)	platforms	survey
Services offered / Post-Award	e-ordering	Yes/ No (basic/ advanced)	platforms	survey
	e-Invoicing	Yes/ No (basic/ advanced)	platforms	survey
	e-Payment	Yes/ No (basic/ advanced)	platforms	survey
Infrastructural tools	e-Certificates, e-Attestations	Yes/ No (basic/ advanced)	platforms	survey
	e-Catalogues	Yes/ No (basic/ advanced)	platforms	survey

Source: IDC, 2012

The implementation of these basic indicators will require the development of specific definitions of each service, clarifying the type of functionalities expected to satisfy the availability condition. For example, e-Submission is a generic definition, which may correspond to the following services:

- Sending a tender electronically with a “sealed” email;
- Uploading an offer to a platform as a PDF file;
- Fill in forms online interacting with a platform, and upload the proposal following a specific interactive procedure, including support by the platform itself.

These are different maturity and sophistication levels of the services. It will be necessary to specify for each basic indicator of availability, what is the minimum package of functionalities corresponding to a positive answer. It is also possible to modulate the basic indicators differentiating between availability of a “basic package” (minimum requirement) and the offering of more advanced services (reflecting the higher sophistication of some platforms).

The definitions will need to be “vendor-neutral”, that is must not discriminate between different solutions proposed by different vendors, focusing on the actual service offered.

The definitions of the services corresponding to each basic indicator will be presented in the Guidelines for data collection and validated in the trial.

5.2.2. Classification of platforms based on Census taxonomy

As anticipated, we will collect data on the main characteristics of the platform of the sample in order to compare them to the main typologies classified in the Census of European E-PEs.

The Census is a database of the e-Procurement Entities (e-PEs) identified and analysed across the EU, including a wide range of characteristics about a representative sample of e-PEs. Based on this, we have developed a classification of the main typologies of e-PEs

present in the population, in order to identify the most important business models affecting the supply and availability of e-Procurement services, particularly e-Submission[2].

The main criteria of classification are the following:

1. Ownership of the platform (Public/Private);
2. Offering of services (focused on e-Notification/e-Submission);
3. Market positioning (focused on the entities scope and relationship with main buyers).

The combination of the criteria results in the following main taxonomical categories and sub-categories (presented in detail in Table 21).

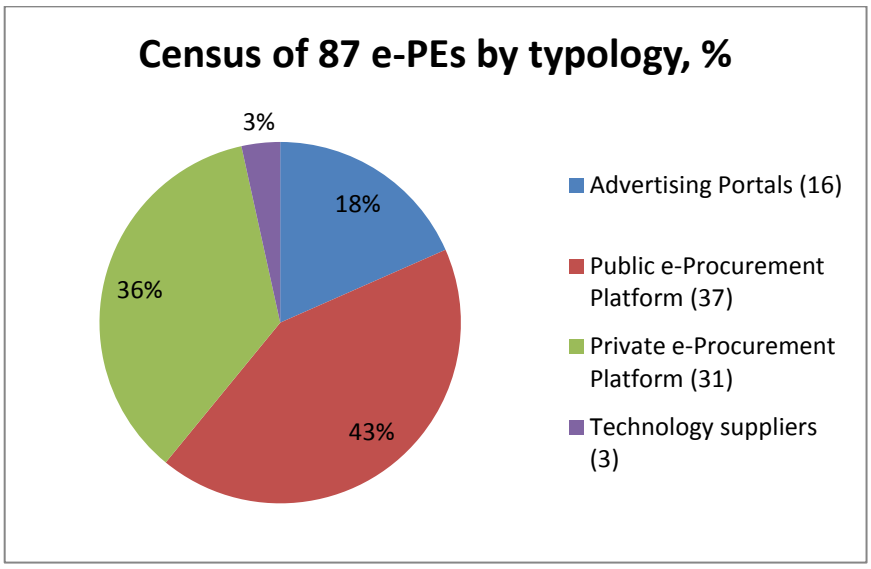
Table 21 Taxonomy of e-Procurement Entities

Taxonomical categories / Typology	Sub-categories	Ownership	Offering	Market positioning
Advertising Portal	Centralised one-stop Portal	Public	e-Notification only	Single, mandatory One-stop information point where all contract notices must be published
	Public non centralized Portal	Public	e-Notification	Non mandatory portal, publishing e-Procurement opportunities of various type or scope
	Private advertising Portal	Private	e-Notification	Non mandatory portal, publishing e-Procurement opportunities of various type or scope
Public e-Procurement Platform	Centralised Public Platform + FA	Public	Pre-award services at least up to e-submission and Framework agreements	Public Platforms providing centralized procurement services with Framework Agreements (FA), at national, federal or regional level. Its services are often mandatory.
	Non Centralized Public e-Procurement Platform	Public	Pre-award services at least up to e-submission	Public Platforms who do not provide centralized procurement services with Framework agreements
Private e-Procurement Platform		Private	Pre-award services at least up to e-submission	Private platforms full service, offering a range of e-Procurement services
Technology Economic Operators		Private	Technology solutions	Private Economic Operators who do not offer transactional procurement services

Source: IDC 2012

[2] See D1 – e-Procurement Landscape report for more details about the taxonomy and the Census

Figure 10 Census of e-PEs by Typology



Source: IDC 2012

As shown in the Figure 10, the most common typologies of e-PEs are private and public platforms, which are targeted by our measurement system.

The comparison between the platforms of the sample and those in the Census will help us to extrapolate the sample data to the total population of ePEs in the EU.

The data collection needs to classify the ePEs are the following:

- Type of ownership
- Type of offering (which will be collected through the ownership indicators)
- Type of Contracting authorities and Economic Operators registered in the platform
- Type of authentication requirements (which will be collected for the performance indicators)

5.3. Conclusions and next steps

The system of indicators presented here will be tested in the "proof of concept trial" with a group of e-Procurement Platforms to be organized in the fall of 2012. More specifically, the Capgemini team is currently designing the processes to set up and organize the trial and the data collection by the platforms. This will include:

- Guidelines for the data collection at the platform level (to be used in the trial);
- Guidelines for the data processing (collection, storage and elaboration of the data to produce the indicators);
- Guidelines for the data communication process (from the platforms to the study team, in the future to the EC);
- Guidelines of the data evaluation process (quality control).

These guidelines will be presented to the EC for approval before the start of the trial.

After the conclusion of the trial, the system of indicators will be revised and a full implementation plan will be developed. This will include a handbook of indicators, presenting the methodology of data collection and calculation of the indicators.