



E-PROCUREMENT PERSPECTIVES IN CONSTRUCTION SECTOR SMEs

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Abstract. Although the construction sector plays an important role in European economics, the use of information communication technology (ICT) systems in this industry is very low while the potential of e-Business to increase productivity and efficiency is not exploited. This paper aims to identify internal processes which are most important to small and medium enterprises (SME) in construction industry and to estimate opportunities to adapt ICT in order to optimise those processes. The methodology used – analysis of current processes in construction companies in pursuance to find out which are most important for SMEs and define future scenarios of one selected process via story telling. Twelve internal current processes of construction SMEs identified and out of those four most important ones selected are: e-Tendering, e-Site, e-Procurement and e-Quality, where “e” stands both for electronic and envisioning. e-Procurement process perspectives are defined and functionalities required for this scenario listed.

Keywords: e-Procurement, construction sector, SMEs, web services.

1. Introduction

Future business in Europe will be conducted by flexible networks of interdependent organizations. It will be global, open and collaborative, dynamic and adoptive, frictionless and consistent. And it will be electronically supported. There are several organizations that are trying to figure out (and influence also), how the construction sector will evolve in the future. Among them there are government bodies, sectorial consortia, and technological providers. There is a general interest in making good use of advanced information technologies to improve the construction processes. There are two sources of special interest: the construction technological platforms and the European government bodies. The main of them are:

- the European Construction Technology Platform (ECTP) 2030 vision,
- the e-Business W@tch reports in the construction sector,
- the current state in e-Procurement and e-Quality regarding standardization and policies.

The Vision 2030 recommends that the design and construction sectors actively engage in a sustainable and competitive Europe. It presents a construction industry that is increasingly client/user-driven, sustainable and knowledge-based, and proposes two interlinked key goals to achieving meeting the client/user's requirements and becoming sustainable.

The aim of this paper is to identify the most important internal processes of construction SMEs and to evaluate possibilities to use ICT to optimise those processes.

Methodology – analysis of existing processes of construction in order to find out which of those are the

most important for enterprises and to define future scenarios of one selected process via story telling.

Main findings – 12 internal current processes of construction SMEs identified and out of them 4 the most important ones selected according to following criteria: scenarios that can be applied in the Construction Sector, providing new interactions between the actors (PMC, Suppliers etc.); Scenarios that allow SMEs to participate with other roles, those up to now were almost impossible; Scenarios focused on B2B interactions; Scenarios that make it possible to create new services and actors like ICT Suppliers, Financial, Regulation Agents; Scenarios that include Legal/Cultural/Socioeconomic/Quality aspects. The processes selected are: e-Tendering, e-Site, e-Procurement, e-Quality, where “e” stands for both electronic and envisioning. Story telling of e-Procurement scenario defined and functionalities required for this scenario listed.

The main objective of EU funded project e-NVISION (IST-028067, “A new vision for the participation of European SMEs in the future e-Business scenario”) is the development and validation of an innovative e-Business platform enabling Construction SMEs to model and adapt particular business scenarios; to integrate all their enterprise applications and to incorporate legal, economical, social and cultural services, with the final goal of facilitating their participation in the Future European e-Business Scenario. This paper presents part of the work carried out within the project and aims to determine the most important processes of SMEs in construction sector showing ICT implementation possibilities in these processes.

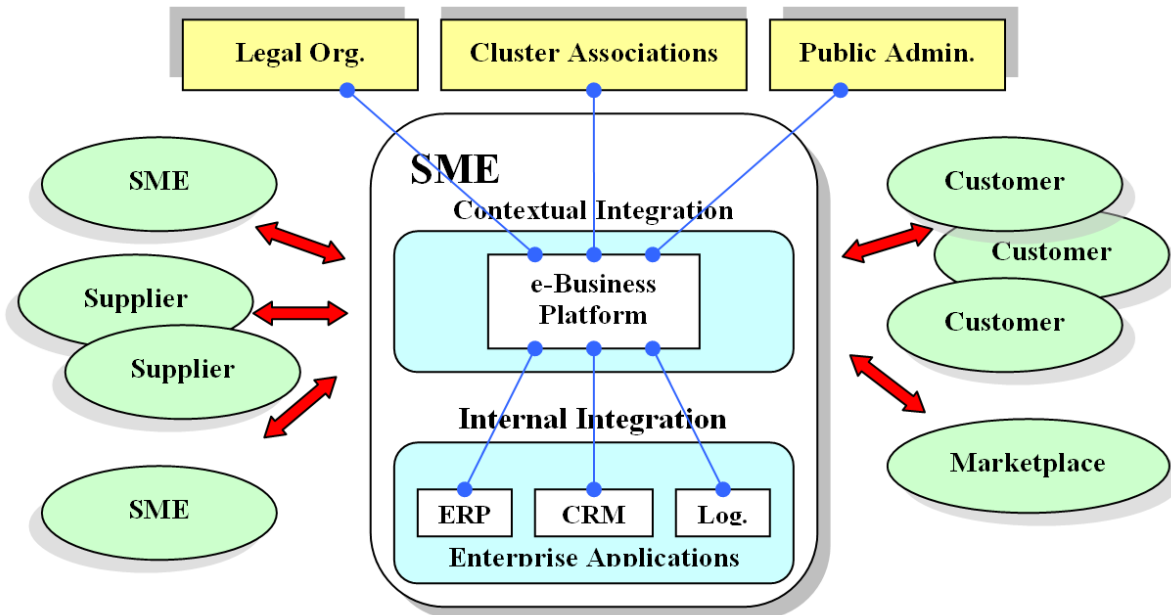


Fig. 1. e-NVISION e-Business platform

2. Methodology

e-NVISION projects aims to develop new e-Business platform. Fig. 1 presents a high-level architecture of the platform that an SME should deploy in order to take part in the envisioning scenarios. It is composed of a central e-Business platform in charge of conducting business with the supply-chain actors, surrounded by 2 kinds of services: external and integration services. Although these services are not the core business of the company, they are necessary to make the companies' supply chain more dynamic and flexible.

This architecture has served as the basis to establish a working methodology. The research methodology was based on the following approach:

- The analysis of current construction processes was based on construction business experts (representatives of construction associations and construction SMEs) interviews for determining main construction business processes (scenario shows one of possible ways that current processes would run in future after IT solutions would be applied to it).
- Secondly, the main construction business processes have been selected according to the following criteria suggested by experts: scenarios that can be applied in the Construction Sector, providing new interactions between the actors (PMC, Suppliers etc.); Scenarios that allow SMEs to participate with other roles, which up to now were almost impossible; Scenarios focused on B2B interactions; Scenarios that make it possible to create new services and actors like ICT Suppliers, Financial, Regulation Agents; Scenarios that include Legal/Cultural/Socioeconomic/Quality aspects.
- Thirdly, envisioning future construction business scenarios ideas have been gathered through brainstorming sessions. In addition, desk research has been carried out to guarantee that the work devel-

oped was in the line proposed by other construction experts and sources, including e-Business Watch, ECTP and other European Projects related to ICT in Construction (European Commission 2005a; Wetherill *et al.* 2002).

- The building of envisioning scenarios have been defined via story telling taking into account all the above and incorporating "higher" level goals to the process definition, such as customer perceived value, whole life performance, legal, social, economic, trust and, if possible, sustainability aspects.

Finally, the requirements needed for these scenarios have been defined from two points of view – SMEs involved and external business environment which include public bodies and construction clusters. These requirements have allowed identifying the integration and external services depicted in the initial architecture.

3. Construction in the future

The European Commission, Enterprise Directorate General launched the e-Business W@tch to monitor the growing maturity of electronic business across different sectors of the economy in the enlarged European Union and in EEA (European Economic Area) countries. According to e-Business Watch (e-Business W@tch, Report 08-I, in terms of ICT uptake and e-Business deployment, the construction sector today is characterised by: highly fragmented ICT usage; a multitude of standards, technical specifications, labels, and certification marks as well as diversity in local, regional and national regulations; a low adoption and integration of relevant ICT in most business processes, especially by SMEs, which are often characterized by communication and knowledge sharing based on personal or telephone contact; many small companies which are typically either organizers of projects and project flows or suppliers to larger project-managing companies, with different ICT requirements.

The construction industry has yet to show the same level of ICT driven improvement of productivity as in other industries. The potential of e-Business to increase productivity and efficiency in the construction sector is far from being exploited. A well-functioning market of ICT vendors and e-Business solutions exists. Barriers for increased uptake of ICT are very much related to lack of resources, insufficient knowledge about ICT costs and benefits, absence of skills, as well as the prevailing traditions and culture in this sector.

Therefore, there is still great potential for further ICT uptake, for example: production planning systems, ERP systems with financial components, inventory management systems, supply chain management (SCM) and mobile solutions. Another conclusion from the report is that business process integration may be a key driver for ICT adoption in the future.

This indicates that it could be cost-effective to launch policy initiatives in order to increase the level of awareness of e-Business applications in the construction sector. In this context, the following 3 areas of policy actions have been identified as appropriate (European Commission 2005a):

- Improving ICT skills;
- Increasing the awareness of ICT benefits and potentials;
- Facilitating the process of interoperability.

The new solutions and increased ICT uptake are expected in 6 areas (European Commission 2005a):

- Collaborative software, project webs and platforms for cooperation between partners in consortia.
- Mobile solutions to improve coordination, flexibility, and resource management.
- Integrated ERP solutions focusing on the main business processes of project management, risk management and resource management.
- e-Procurement as a way to reduce costs in large project-driven firms (consortia leaders).
- e-SCM (systems for supply chain management) to support internationalisation and industrialisation.
- As reduced margins drive business models to focus on services, industry ERP solutions will include management of services, e.g. facility management. Other construction companies will expand into project development and will look for ICT solutions that support this.

The research carried within e-NVISION project aims at providing insight into some of the above areas: e-Procurement, B2B based ways of collaboration between partners, and services oriented integration in the Construction sector. Analysis of current processes that takes part in the Construction Process was done and the following processes were identified:

- PM-01: Tender and agreement with the General Contractor.
- PM-02: Control of design documentation
- PM-03: Planning and scheduling
- PM-04: Construction coordination
- PM-05: Investor's supervision

- PM-06: Marshalling of machines and equipment deliveries
- PM-07: Organisation of process start-up
- PM-08: Preparing reports
- PM-09: Control of costs and financial settlements
- PM-10: Final acceptance and report
- PM-11: Development and implementation of Quality Assurance Programme
- PM-12: Supervision of safety and health at work matters (e-NVISION project IST-028067 2007a).

The construction sector is moving from a very traditional sector, where the main objective for development was to minimize the construction costs, towards a demand driven sector where other factors, such as product quality, user requirements or even sustainability are taken into account. The idea behind this evolution is to give priority to sustainability over other industry priorities. Hence, as the construction sector is maturing, the business drivers tend to shift from basic cost, quality and time towards "higher" level goals such as customer perceived value, whole life performance and sustainability.

The criteria used for selecting and defining the business processes have been suggested by construction sector experts (e-NVISION project IST-028067 2007a):

- Scenarios that can be applied in the Construction Sector, providing new interactions between the actors (PMC, Suppliers, etc.).
- Scenarios that allow SMEs to participate with other roles, those up to now being almost impossible.
- Scenarios focused on B2B interactions.
- Scenarios that make it possible to create new services and actors like ICT Suppliers, Financial, Regulation Agents.
- Scenarios that include Legal / Cultural / Socioeconomic / Quality aspects.

Four scenarios have been selected to be envisioned out of 12 because they best fulfil the above criteria (e-NVISION project IST-028067 2007a):

- PM-01: Tender and agreement with the General Contractor.
- PM-04: Construction coordination.
- PM-06: Marshalling of machines and equipment deliveries.
- PM-11: Development and implementation of Quality Assurance Programme.

In the current paper a more detail analysis will be concentrated on PM-06: Marshalling of machines and equipment deliveries or e-Procurement process.

4. e-Procurement scenario description

Topic of procurement of construction materials, equipment and services via internet is not very new – quite a few authors (Construction Industry Institute 1987; Kong, Li. 2001; Obonyo *et al.* 2002; Kong *et al.* 2004; Dzung, Lin 2004; Hadikusumo *et al.* 2005) already analysed this issue. They provide findings of authors of the paper on this issue from SMEs in Lithuania, Slovenia and Poland (e-NVISION project IST-028067 2007a).

The procurement process of *acquiring products and services for the construction* takes into account the Investor requirements specified in an accepted offer that contains all the technical documentation needed to execute the whole construction process dealing among others with the following aspects:

- *Look for suppliers offering whole products*, like house/part of construction/installations or machinery where supplier himself must get (well procure on his level) all building products/materials to make his product.
- *Look for suppliers offering specific services*, like designers to make plans, engineers to make calculations, solutions, engineers to supervise actions like design, building on site, quality of delivered material etc.
- *Choose (PMC or Investor) the most appropriate supplier* to buy some building products that construction company (Contractor) will use to build.
- *Choose the most appropriate supplier* to rent some building machinery.

Therefore, in this process will be involved all or part of the following actors, playing different roles depending on the type of situation:

- (General) Contractor,
- Project management company (PMC),
- Investor,
- Suppliers (SMEs) of building products and services.

Nowadays, it is very difficult for new SMEs (suppliers) to start working with an investor if no previous contacts have taken place between them. Therefore, the SMEs have a very limited market with enormous difficulties to expand. Therefore, it is clear that SMEs need new advertisement ways to expand their trading activity.

On the one hand, the Investor has not got easy ways to find new suppliers and usually works with the same ones without benefiting from other suppliers (international market, new start-ups SMEs etc.). Moreover, investors are under pressure to find ways to cut costs but obtaining, at the same time, good quality products, in order to survive and to sustain their competitive position on their markets.

At the same time, the Construction Sector is moving from a very traditional sector, where the main objective

for development was to minimize the construction costs towards a demand driven sector, where other factors, such as quality of the products, logistics, or the user requirements are taken into account.

Therefore, the new and original approach to this construction e-Procurement process will be a focus on the discovery, evaluation and selection of the most appropriate suppliers for an Investor or PMC.

It is foreseen that two main sub-steps will be most important for e-Procurement process, firstly a *selection of potential suppliers* will be done based on supplying and offering characteristics (see e-NVISION project IST-028067 2007a) and secondly selection will be checked by an *Analysis of Quotation & Selection of Suppliers*.

Further all steps of this process (Fig. 2) are described in detail.

1. *Schedule deliveries*. Project Management Company or other entity (Contractor) that needs to buy products/services (further in this article – PMC) prepares a list of products/services required for implementation of project.

2. *Select Suppliers*. In accordance with list of products / services PMC and Investor selects appropriate suppliers / providers. The key idea of the innovative scenario is the development of an effective and rational supplier selection model where the participation of a bigger number of SMEs (suppliers) will be promoted comparing to what it is now in practice. To do so, this step is decomposed in sub-steps in order to *formally* adding the technological knowledge necessary to enrich this process.

2.1. *Search in Internal Database for Potential Suppliers*. Depending on positive or negative previous experience, PMC divides its suppliers into 2 groups: “white list” (preferable suppliers) and “black list” (suppliers preferable not to work with). Suppliers might be on list depending on recommendations of other companies PMC trusts in. This list together with some additions from Investor the compiles initial list of suppliers.

Firstly, the PMC goes to the “white list” to look for an appropriate supplier to provide him with required products and services. That list of suppliers will contain valuable information from *previous works* and information of the *supplier activities*, types of products, sourcing strategy etc. in order to make a proper search.

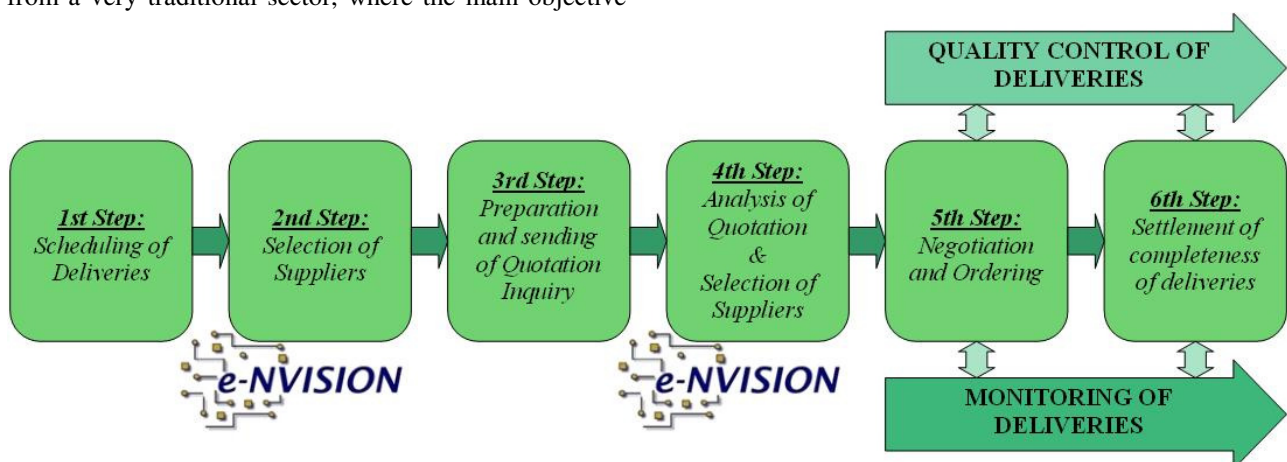


Fig. 2. Schematic representation of procurement process

This internal database will be mapped in terms of the Company and Product Service Ontology to have a more enriched reasoning to look for suppliers.

Depending on how many results appeared afterwards, PMC searches externally for other possible suppliers (if no suppliers of the item found and/or were found not enough of them) or selects potential suppliers (if enough suppliers were found in the initial list).

2.2. *Search externally.* If there were no (or not enough) possible suppliers, PMC searches for them externally.

To carry this PMC searches on a registry where the suppliers (SMEs) that belong to the e-NVISION platform have their products and activities mapped in terms of the e-NVISION domain Ontologies. (Note that PMC could go back to include the "Black list" suppliers, if no other choice).

2.3. *Select Potential Suppliers.* At this stage PMC has a list of possible suppliers select from. There may be criteria which help to remove suppliers from that list, or to put those suppliers in according with those specific criteria (Sonmat 2006).

2.4. *Prepare Final list of Potential Suppliers.* After selection of potential suppliers, list of them is prepared. It is used in next step of e-Procurement process to send quotation inquires out.

3. *Prepare and send Quotation Inquires.* After selection of potential suppliers, Quotation Inquires are prepared and sent to the list of selected suppliers. List of products/services, preferable payment and delivery conditions, deadline of quotation inquire and other information is indicated in the quotation inquire. After sending it, PMC waits for answers.

4. *Analyze Quotation & Select Suppliers.* If some offers are received, PMC analyses them and decides upon the final list of suppliers to proceed with.

Decomposition of the sub-process of analysis of quotation and selection of suppliers is described below.

4.1. *Receive Offers.* Company receives offers from suppliers. They might be sent not only from those suppliers, to whom Quotation inquires were sent, as SMEs might look for customers themselves and if they got to know somehow about project they might try luck.

4.2. *Rank Offers regarding the most important criteria (1 to n).* As PMC needs to know, which offers received best fits him, so they are ranked according the criteria most important to PMC. Sometimes one criterion is prevailing, sometimes the other; a compound criterion can be implemented. During the analysis of an offer some variations must be considered: is the offer with exact items, are quantities as requested or, in general, which offer is closest to the request also checking other limits.

4.3. *Choose 1 or few offers best fitting to criteria.* After ranking offers PMC decides which of offers best fit its needs.

5. *Negotiate an Order.* Afterwards, the PMC and the Investor carries out commercial negotiations with the chosen suppliers and places orders. Order represents all conditions (certain products, quantities, prices, payment,

delivery and other conditions) upon which supplier and PMC agreed during negotiation.

6. *Settle completeness of deliveries.* Before settlement of bills the deliveries to the building site or warehouse must be checked, if they had been executed as planned (also checking quality certificates, quantity and time of delivery).

5. Requirements for e-NVISION platform for implementing e-Procurement scenario

A set of requirements have to be fulfilled so that a described envisioning scenario can take place. Some of them describe what the SME must accomplish, the processes that the organization must follow or constraints that they must obey. Nevertheless, there are other requirements that are out of the scope of SMEs and depend on public organizations, governments, ICT providers or standardisation bodies.

In the e-NVISION project considered requirements are grouped into 6 categories:

1. *Data model* is a structured representation of all data elements and their relationships related to a specific business domain or application. Data models can be expressed in terms of databases, taxonomies, glossaries, dictionaries or in a more enriched way using ontologies. Data models needed for the envisioning scenarios are: tender model, company model, product/service/equipment models, scheduling model, construction work model, quotation/order model, quality model, project model and competences model.

2. *External services* are semantic web services offered by external agents or third parties (e.g. trust and legal agents, agents for the prequalification of SMEs, insurance company) or by the e-NVISION platform (e.g. tender configurator, procurement configurator, supplier discovery service, service locator, registry).

3. *Integration services* integrate the innovative e-Business platform with the internal enterprise applications (e.g. CRM, ERP, companies databases, document/content management, logistics, quality management) following a semantic service-oriented architecture. Other integration services offered by the e-NVISION platform are the scheduling service and the agent for the analysis of quotations.

4. *Organisational requirements* are those changes that the SME has to introduce in its organization, managing team building and working practices (including training for efficient use of electronic tools) in order to make e-Business.

5. *Socio-cultural requirements* are any cultural or socioeconomic change that has to be promoted by Public Administrations to allow a bigger participation of SMEs in envisioning e-Business scenarios (e.g. more transparency when bidding for a contract, education to increase trust in electronic ways of conducting business, e-Business technology adoption by Public Administrations).

6. *Infrastructure requirements* comprise the requirements set by the platform regarding hardware or software components (e.g. 24/7 accessibility and high-

speed Internet connection, desktop computer or portable device, digital registration, identification and signature).

6. Required functionalities for e-Procurement scenario

Below we describe how the system should work i.e. 'functional requirements'. Some of these requirements identified are direct legal requirements, while others are functional prerequisites for implementing those legal requirements in a fully integrated system. The functional requirements for the e-nvisioning scenarios follow the guidelines of the report "Functional Requirements for Conducting Electronic Public Procurement Under the EU Framework" produced by European Dynamics S. A. on behalf of the European Commission (2005b).

The e-Procurement scenario focuses the envisioning efforts mainly on two of these tasks:

1. *Selection of suppliers*. This task would be performed using "Procurement Configurator" external service (e-NVISION project IST-028067 2007b).

The Procurement Configurator external service provides means to configure the list of potential suppliers that can provide a certain schedule of deliveries. This schedule consists of a list of products, materials, machinery and equipment identified by a standard classification system. Examples of possible classification systems are CPV (Common Procurement Vocabulary), UNICLASS, OMNICLASS etc. During the tests the CPV classification system will be used. However, the e-NVISION ontology and the Procurement Configurator are flexible enough to allow other classification systems.

The Procurement Configurator service takes the list of products, materials, machinery and equipment needed from the schedule of deliveries and matches them with those offered by the companies. The configurator will provide different possible configurations of companies that can provide the schedule of deliveries ranked according to the criteria defined by the user.

The user can define 2 types of criteria: exclusion criteria and ranking ones. By exclusion criteria we mean all criteria that must be fulfilled in order to provide a valid configuration. Examples of them are:

- *Country or region exclusion criteria*. Only companies of the specified country or region will be selected. ISO 3166-1 codes will be used for countries and ISO 3166-2 codes will be used for regions because ISO codes are considered as standard.
- *Maximum price exclusion criteria*. The user can define the maximum price of the schedule of deliveries. A configuration of companies will be a possible solution only if the sum of the prices of all the items that make the schedule is lower or equal to the specified maximum price.
- *Minimum price exclusion criteria*. The user can define the minimum price of the schedule of deliveries. A configuration of companies will be a possible solution only if the sum of the prices of all the items that make the schedule is bigger or equal to the specified minimum price.

- *Maximum number of companies exclusion criteria*. This is the maximum number of companies that can make a valid configuration.

- *Minimum number of companies exclusion criteria*. This is the minimum number of companies that can make a valid configuration.

Ranking criteria are criteria that can be used to rank different possible configurations of possible suppliers. The user will only be able to enter one ranking criterion but as many exclusion criteria as needed. Examples of ranking criteria are:

- *Price ranking criteria*. The list of possible configurations will be ordered according to the total price of the schedule of deliveries, being the configuration with the lowest price the first in this list.

- *Number of companies ranking criteria*. The list of possible configurations will be ordered according to the total number of companies that make the configurations, being the configuration with the minimum number the first in this list.

2. *Analysis of quotation* task would be performed using "Agent for Analysis of Quotations" integration service (e-NVISION project IST-028067 2007c).

The agent for quotation analysis integration service provides the means to rank quotations by criteria. To do this analysis the Quotation/Order Model included in the e-NVISION ontology will be used. The main functions of the QuotationAnalysisAgent are:

- The agent for the analysis of quotation integration service is designed to choose the best quotations (proposals) out of those sent to the company.
- The service is supposed to rank quotations (proposals) so that the user of the service can see which quotation is best.
- For ranking quotations, the criteria defined by the user will be used.
- There could be the possibility of giving weights to the criteria specified by the user.
- Possible ranking criteria are:
 - price (or ratio price/performance);
 - performance (product/service properties – at least they must match requested, but if they are better, maybe they score better – depends on Investor wishes);
 - quality (CE mark, other certificates/awards, good experience from previous projects);
 - experience from previous collaboration (like issues of quality of products/service, delivery, etc.);
 - delivery in time frame;
 - geographic location (proximity);
 - competence (quality, reliability) of supplier;
 - special offers from suppliers/providers.

For this scenario the following functionalities are required:

Registration mechanism (with user's authorization and authentication). This functional requirement allows users to register to e-NVISION services. The registration process must ensure the confidential transfer and storage of all personal information of users. Furthermore, mecha-

nisms may be put in place for validating the information provided by new users of the system. Hence, the registration process may be performed in 2 phases. One phase can allow new users to apply for registration to the system, and another phase can allow an authorised personnel to validate the submitted information and approve or reject a registration application.

This functional requirement relates to the ability of the e-NVISION system to store personal information of its registered users and companies. Users can update their personal information if required. The information will be stored in terms of the data models previously identified.

Moreover, user profiling can allow users to setup their preferences when using the system, in terms of how data is searched, displayed etc. Depending on the user's rights to each user, the system can control which activities a user can perform, as well as, what data a user should have access to.

Search suppliers mechanism. To any registered party a system may provide that it can search through all registered suppliers and locate ones that provide a certain product, material, machinery or equipment.

Evaluate suppliers according to criteria. System may provide a mechanism to evaluate suppliers according to specified criteria. This will facilitate the selection of suppliers.

Request for quotation. System may provide a mechanism to request a quotation to a supplier, i.e. to send electronically a quotation inquiry.

Evaluate quotations according to criteria. System may provide a mechanism to evaluate quotations according to specified criteria.

Request for order. System may provide a mechanism to request an order to a supplier, i.e. to send electronically an order.

Accept/Reject order. The e-NVISION system may provide a mechanism to accept or reject an order.

7. Conclusions

It is a fact that the future business scenario will be global, open, collaborative, dynamic, adaptive, frictionless and consistent. The question is whether the SMEs are ready to participate in it or not. Therefore, more than an opportunity, SMEs have to see it as a necessity, as a way of survival. Public Administrations have the responsibility to provide SMEs with all the mechanisms and tools needed to survive in this globalised world. But at the end SMEs will have to make an effort adopting organisational changes and acquiring skills and capacities needed to participate in the future e-Business scenarios.

Most significant changes of future e-Procurement scenario from current procurement process are foreseen in 2 steps: Selection of Suppliers and Analysis of Quotations & [final] Selection of Suppliers. Today SMEs believe that those steps are more effectively performed manually than any software would do it. Findings of article show that a successful implementation of "Procurement Configurator" web service will increase the speed and efficiency of initial Selection of Suppliers. Meanwhile successfully implemented "Agent for Analysis of

Quotations" integration service will improve analysis of offers/quotations received in order to select the best possible supplier.

Envisioning e-Procurement scenario allows the participation of the biggest number of SMEs (suppliers) and more complicated ways of collaboration among them. Therefore this envisioning scenario matches in an appropriate and optimal way the demand (investor needs) and the offer (supplier services) deploying the requested e-marketplace in the envisioning ideas.

In future e-marketplace, the products and services will be published allowing different ways of interdependences between them to provide the best matching mechanism for a specific market need.

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E. PIRKIMŲ PERSPEKTYVOS SMULKIOSE IR VIDUTINĖSE STATYBŲ SEKTORIAUS ĮMONĖSE

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S a n t r a u k a

Elektroninis verslas statybų sektoriuje yra labai ribotas. Nepanaudojamos jo galimybės statybos verslo procesų produktyvumui ir efektyvumui didinti. Straipsnyje siekiama išskirti svarbiausius vidinius smulkių ir vidutinių statybos įmonių (SVĮ) procesus bei įvertinti informacinių ryšio technologijų taikymo galimybes šiems procesams optimizuoti. Naudojami metodai – tai esamų statybos procesų analizė siekiant nustatyti, kurie iš jų įmonėms yra svarbiausi, ir apibūdinti vieno pasirinkto proceso ateities perspektyvas. Išskirta dvylika statybos smulkių ir vidutinių įmonių vidinių procesų, iš kurių, remiantis tam tikrais kriterijais, atrinkti keturi svarbiausi: e. konkursas, e. objektas (statybų aikštelė), e. pirkimas ir e. kokybė (čia „e.“ žymi elektroninį ir numatomą procesą (angl. *envisioning*)). Straipsnyje išsamiai aprašytas numatomas e. pirkimų procesas, įvardyti jam keliami funkciniai reikalavimai.

Reikšminiai žodžiai: e. pirkimai, statybų sektorius, SVĮ, interneto paslaugos.

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