Trusted operational scenarios - Trust building mechanisms and strategies for electronic marketplaces.

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Technical University of Kosice

2007

Project IST-FP6-026476 SEAMLESS
"Small Enterprises Accessing the Electronic Market of the Enlarged Europe by a Smart Service Infrastructure"
STREP – Information Society Technologies (IST)

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Deliverable D1.2

Trusted Operational Scenarios

Workpackage WP1 – Collaboration Framework
Task T1.2 – Trusted operational scenarios

Abstract

This document presents and describes the trusted operational scenarios, resulting from the research and work carried out in Seamless project, task T1.2. This report presents identified collaboration habits of small and medium enterprises with low e-skills, trust building issues as main enabler of online business relationships on the electronic marketplace, a questionnaire analysis of the level of trust acceptance and necessity of trust building mechanisms, a proposal for the development of different strategies for the different types of trust mechanisms and recommended actions for the SEAMLESS project or other B2B marketplaces.

Start date of project	Jan 1st, 2006	**Duration of project**	30 months
Deliverable due date	Jan 21st, 2007	**Actual submission date**	Jan 29th, 2006
Dissemination level	PU	**Revision status**	Final
Responsible partner	Technical University of Kosice	**Authors**	Radoslav Delina Viliam Vajda Peter Bednár
		Contributors	T1.2 participants

As this report was developed for the Seamless project, some interconnections are presented in the document. For identification the relations, see official Seamless project website on http://www.seamless-eu.org. All outcomes from this report are useful generally for any other B2B marketplace projects or as input for further researches in the field of B2B trust building mechanisms.

Project co-funded by the European Commission within the Sixth Framework Programme, Information Society Technologies (IST)

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Acknowledgements

This report was prepared by Technical University of Kosice on behalf of the European Project IST-FP6-026476 SEAMLESS "Small Enterprises Accessing the Electronic Market of the Enlarged Europe by a Smart Service Infrastructure". The authors wish to acknowledge the European Commission for their support. We also wish to acknowledge our gratitude and appreciation to all the Seamless project partners for their contribution during the development of research presented in this report.

Editor: Radoslav Delina, Technical University of Kosice

Publishing Company: Moderna organizacija

The report is available only in electronic format and can be downloaded from http://www.seamless-eu.org/deliverables/TrustedOperationalScenarios.pdf.

Kranj, 2007

ISBN 978-961-232-205-2

Published in Slovenia

Project co-funded by the European Commission within the
Sixth Framework Programme, Information Society Technologies (IST)

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Abbreviations

T&C	Textile and clothing
B&C	Building and construction
ODR	Online dispute resolution
ES	Escrow service
ESP	Escrow service provider
P2P	Peer to peer
NMS	New member states
RFx	General acronym for any request for quotation, proposal or information
RFQ	Request for quotation
RFP	Request for proposal
RFI	Request for information
CCT	Contract clauses and templates

1 Executive Summary

This document presents the results of the work carried out in workpackage WP1 "Collaboration Framework" and, specifically, task T1.2 "Trusted operational scenarios". It describes trust issues and proposes trusted functionality pertinent to SEAMLESS.

The main objectives of this report are:

- To identify main trust building mechanisms for SEAMLESS
- To analyse level of trust to identified trust building mechanisms
- To identify a minimum set of trust building mechanisms when SMEs join SEAMLESS
- To develop trusted operational scenarios – business scenarios with implemented trusted mechanisms
- To recommend several strategies and ways for increasing trust to SEAMLESS services.

The trusted operational scenarios have been developed on the basis of the analysis carried out in task T1.1 and documented in deliverable D1.1 "Requirements specification". Barriers and expectations were examined. Trust absence and requirement was the main factor, to look for improvements of SEAMLESS business scenarios especially from a socio-economic point of view.

According to identified different trust mechanisms in the field of electronic marketplaces and B2B relationships, the questionnaire was developed to better examine the needs and potential impact on the perception of trust within targeted groups – small and medium enterprises within the textile and building and construction sector. On the basis of the analysis, the primary strategies were developed and analysed from the aspect of implementation and business and organizational models. According to these strategies, for every type of trust issue, a short SWOT and impact analysis on other workpackages within SEAMLESS project were described.

This document is subdivided into 6 main chapters and 3 appendices:

- Cooperation habits overview: The chapter summarises and enhances the findings on current cooperation habits between small and medium enterprises especially those low e-skilled ones. On the basis of these identified habits, the scenario was modelled, which will be used for the impact analysis of trust building mechanisms into SEAMLESS business scenarios.
- Trust as a success factor: The chapter addresses trust issues as a main success factor for achieving required liquidity within a B2B e-market (high number of participants and transactions). It presents basic characteristics of trust issues and identifies useful results from several researches and studies.
- Trust building mechanisms: The chapter provides overview of identified trust building mechanisms for the B2B online relationships within e-markets. Although, in the beginning, technology aspects of trust is described, it is mainly focused on socio-economic aspects as most complex aspect of B2B relationships. Several mechanisms and elements were described according to their specifics and needs.
- Research: The chapter presents research carried out in several European countries regarding trust building mechanisms and general trust issues. The impact of identified trust building mechanisms was examined and minimum necessary components for joining e-market were identified. Together, other trust issues were addressed like acceptable type of mediator as trust service provider, business models for the fees policy, level of benevolence and willingness of providing sensitive information. The chapter provides results in graphical form enhanced by description of interesting findings.
- Operational scenarios: The chapter uses analysis from previous the chapter to propose and discuss several possible and acceptable strategies on how to solve trust building on the SEAMLESS platform. Identified and considered strategies are summarized in the table with description of concept, benefits and disadvantages, impact on other workpackages. Together,

SEAMLESS business scenarios with trust building strategies are modelled and presented, and impact on current business processes of SMEs is considered.

- List of scenarios elements and recommendations: Summary table of strategies, mechanisms used, specifics, and other comments.
- Appendix 1: Questionnaire for trust analyses, which was used for identification of trust level and perception to proposed trust building mechanisms.
- Annex 2 Code of Conduct Checklist, which can be used as best practice for developing code of conduct for the SEAMLESS platform.
- Annex 3 Example of contract, as example, which presents integration of negotiated data and company information.

The document is public. The intended audience includes the following categories of possible readers:

- Technical partners, mediators and universities in the SEAMLESS consortium. Deliverable D1.2 provides a functional and business process specification and requirements for the trust building issues which can affect ontology and development efforts and other work done esp. on business and organizational model development and dissemination.
- The other projects of the DE cluster. The trusted operational scenarios developed and presented by the SEAMLESS project, cover and overcome critical issues regarding the trust barriers identified by several international institutions and professionals, that are common to other projects in the DE cluster. Results provided by this deliverable are useful to share with them the adopted approaches and strategies.
- Academia and research institutions. The SEAMLESS trusted operational scenarios are a practical implementation of ideas and concepts coming from the research world on trust building. As such they represent a concrete opportunity of validation with respect to all the difficulties coming from adapting the theoretical approach to hard on-field use.
- Possible followers. Finally, the deliverable is a way to publish the description of an important and critical component of the SEAMLESS platform that can enable third parties (e.g. software houses, service providers) to undertake parallel development initiatives.

2 Cooperation habits overview

As described in Deliverable D1.1 and in many research reports, electronic services are problematic areas regarding intention of ICT implementation into business processes. It is determined by different level of awareness, readiness, low trust in electronic environment and other barriers.

According to results of D1.1, what is very important for the adoption of ICT and company shift to the electronic business platforms is range of electronic services with appropriate level of trust and clear presentation of economic impact. To understand what changes in business processes, especially regarding trust mechanisms, we need to have a look at commonest business models within low e-skilled companies.

According to E-business w@tch, online purchasing is conducted mainly in national markets. For example, online purchasing mainly international in B&C industry to international partners are placed only in 8,2% of cases, whereas in textile it is around 18%. But more significantly, the level of conducting online purchasing mainly in national is visible in 69% of B&C and 71% in textile industry (from the companies buying online – 41%). International online commerce is really very unusual.

From D1.1 survey of target group in textile industry we can see, that the only communication media used are paper-based or non-standardized via fax and email. Paper is still the predominant communication medium, although medium companies show a tendency towards the use of electronic communication.

Compared to the T&C companies, the companies from the B&C sector seem to be more aware of the benefits of computer networks and the WWW. A local area network (LAN) is used by 72% of small, 86% of medium and 75% of large companies. Additionally, 29% of the medium and 75% of the large companies have an intranet and make use of wireless technology. Most companies have their own web site (55% small, 83% medium and 75% large companies). Like in the T&C sector, the utilisation of software applications is mainly restricted to email clients, web browsers, office programs and programs to support sales and accounting activities.

In conducting online business, big differences exist between countries and different sized companies. For example, in the Slovak B&C industry, the use of ICT for business between small and micro companies is almost none.

Lack of trust in electronic tools and information on the internet were identified as one of the most important limitations for using an online business platform. Regarding the functionality provided by the SEAMLESS solution, from main requirements which were identified, trust building mechanisms for searching and negotiation emerged as a very important issue. More trust should be provided with regard to information about company and product, past behaviour analysis and payment against delivery.

When we want to examine potential impact on companies, which still conduct business traditionally or online in a very limited way, we need to examine current cooperation habits of these companies. According to review results with several experts in focused sectors, we have identified the most used or dominant business models between SMEs companies. Fig. 1 presents business process from searching partner to transaction realization.

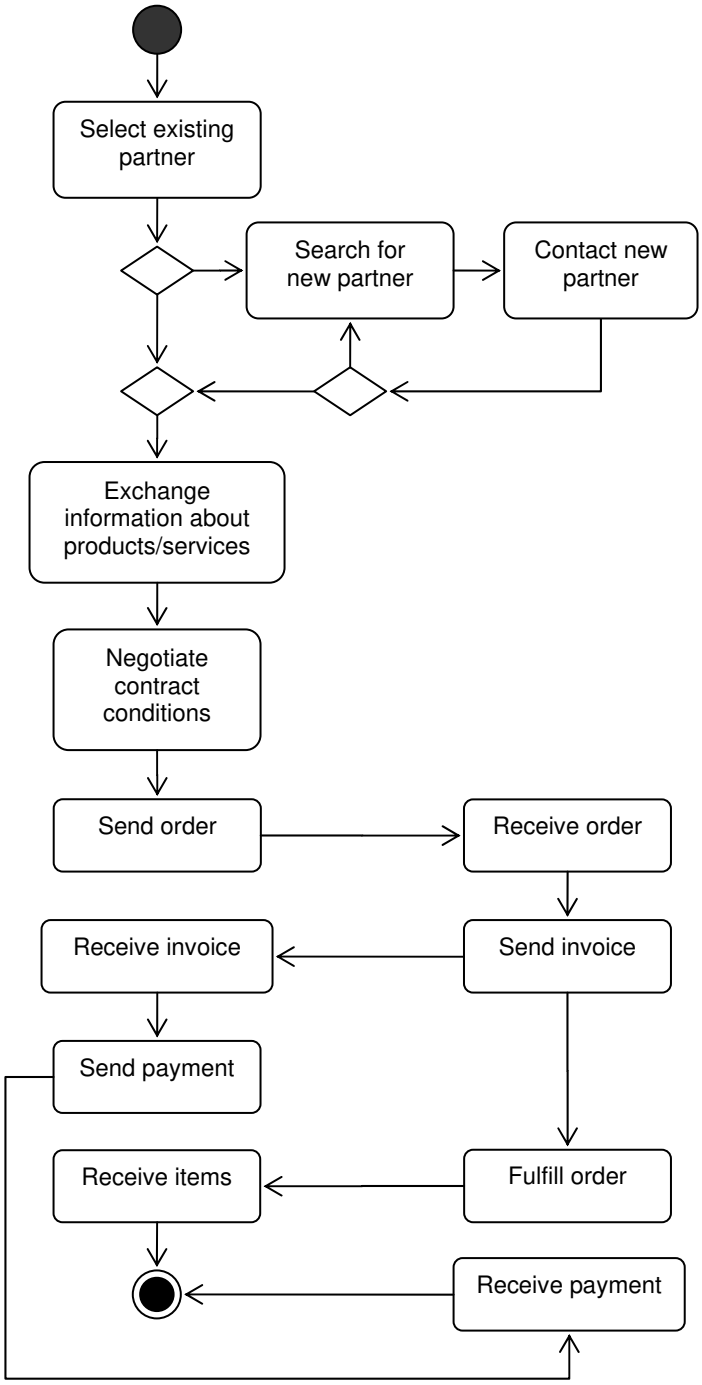


Fig. 1 *Current habits in cooperation between low e-skilled SMEs*

From interviews with experts from NMS countries, we have identified most used patterns of how low e-skilled SMEs conduct their business in particular phases. In the next table we present sequences of preference within particular business phases:

	Business phases		
Order	**Searching for products or partners**	**First contact with potential business partner**	**Exchange of information, communication**
1.	Own catalogues	Email	Face to face
2.	Public catalogues	Phone	Phone
3.	Internet	Fax	Fax
4.	References	Third trusted parties	Email
5.	Exhibitions		Post correspondence

As the legislation of e-invoicing is not yet implemented in many countries esp. in NMS, arrangement of contract is traditionally conducted personally or using third trusted party

As we see, the effects of ICT implementation on this kind of SMEs would be positive, but have several barriers, esp. low trust in technology and business on the Internet. That's why the trust issue seems to be one of the most important for success of any e-marketplace. Dissemination with practical demonstration and best practice presentation will be vital for convincing SMEs to adapt conducting online business through e-marketplaces.

3 Trust as a success factor for B2B e-markets

The characteristics of the e Commerce transactions differ vastly from those conducted in the physical world of business. Personal face-to-face meetings, exchange of information, obtaining references and reputations of various parties from customers and partners and negotiation of contracts have helped the transacting parties to develop some instincts on the relative trustworthiness of the parties in traditional physical world. Legislative framework also helped in developing an agreeable level of risk. The transaction is completed often by the simple act of handshaking, which signals trust. The online environment, where physical contact doesn't exist, where number of potential unknown business partners vastly increases and technology acceptance has significant gaps, opened many new specifics and open issues reflecting trust.

In electronic commerce, where the buying and selling of goods or services is conducted online (eMarketServices 2004a), trust has received significant attention, as it is related to growth in this area of business. The Commission of the European Communities noted that, in order to win consumers as well as businesses over to e-commerce, it is necessary to build trust and confidence. In concrete terms, consumers and businesses must feel confident that their transactions will not be intercepted or modified, that both sellers and buyers own the identity they claim, and that the transaction mechanisms are available, secure and legal (eMarketServices 2005).

In this section we will examine different characteristics of trust in conducting electronic commerce on online business platforms, and different trust building mechanisms will be identified and discussed.

3.1 Definition and dimensions of trust

Trust is a complex notion. Current literature on trust tends to be theoretically fragmented and the definitions show a great degree of disparity (e.g. Blois 1999, McKnight et al 2002a). In the field of B2B relations many studies do not even define trust and those that do refer (Blois 1999; Morgan and Hunt 1994, p. 23) the trust was defined as confidence in the other party's reliability and integrity (Nicholson et al. 2001). The trust is perceived firstly, as a belief, sentiment or expectation about the trustworthiness of an exchange partner, secondly as an intention or behavior reflecting vulnerability and uncertainty on behalf of the party who trusts, hereto referred to as the 'trustor'. It means "a willingness to rely on an exchange partner in whom one has confidence". On the other hand, in a retailing setting, trust was defined as consisting mainly of credibility and benevolence (Ganesan 1994). Credibility refers to the vendor's expertise to do the job effectively and reliably. Benevolence is the vendor's intentions and motives to be beneficial to the buyer in a new situation for which there is no previous commitment (ibid).

When defining trust for e-commerce, we also should consider the nature of the trustee. With respect to this, researchers have disputed regarding to whether trustors and trustees always must be human or if they may be artificial as well, such as computer software or some kind of information system. Some of them say that only human can place trust as (Friedman et al. 2002). On the other hand, some studies show still low confidence in, but also big perspectives of, technology solutions providing trusted services (Duke Law & Technology review 2004).

According to the level of trust in an electronic environment, the positive outcomes of trust emerge (Chopra and Wallace 2003). In a B2C e-commerce setting, such a positive outcome is the act of paying online (Koufaris and Hampton-Sosa 2004, Dimitrakos 2001, Tan and Thoen 2001), or the sharing of personal information and acting on the advice of web vendors (McKnight et al. 2002a). In the field of electronic markets, some studies show empirical evidence of outcomes such as increased satisfaction with the exchange relationship, reduced uncertainty about products and transaction partners, an expectation of future transactions (Pavlou 2002) and other evidence as described in next section.

In this report we follow the definition by Moorman et al. (1992), as described above. We define trust as a trustor's willingness to rely on an exchange partner in whom the trustor has confidence. Confidence refers to the credibility and benevolence of the exchange partner (the trustee). Given the online context of B2B EMPs we include the web site, or any other IT system, in our definition of the trustee.

In many cases, the trust is mainly considered as societal issue resulting from building relationships and connections to large number of unknown companies. For that reason, developing trust must happen in

several stages or dimensions. The market participants should be assured that some of the common problems hampering trust are addressed. Traditionally, the main aspects reflecting trust are authentication, non-repudiation, integrity and encryption. All these constitute the technology dimension of trust. They provide the needed security to the market participants to operate in a virtual market place. On the other hand, new dimensions, more focused on socio-economic aspects of trust emerged. Thus, we are taking into account three dimensions reflecting online trust as follows (Mahadevan, Venkatesh 2000):

On line Trust - Technology Dimension, which relates to the security and confidentiality in the online market place. Authentication, non repudiation, data encryption and security and access control are crucial factors for achieving confidential transfer and sharing of sensitive information between business partners.

On line Trust – Market Place Dimension, which relates to the credibility of the online market place. The main role of marketplace trust is taken by corporate governance mechanisms, richness and depth of service offerings and brand equity issues. The governance could be neutral - where independent subject is owner, industrial consortium – where the owner is grouped from main players in the industry, and private – where commercial subject, often the big player from the industry, is the owner. On the other hand, the marketplace trust can be perceived also through a set of useful and trusted services provided, and the reputation, the brand has in the e-marketplace.

On line Trust – Market Participant Dimension, which relates to the credibility of market participants. B2B transactions involve huge monetary transactions, complex operations and close co-ordination. They are also mission critical. Consequently, in such transactions, some trust issues emerged as uncertainty about identity, credit and skills of business partner. Finally, the sellers and buyers would like to ensure that the online market host has the required business fundamentals to enable and sustain their trade. The ability to check the credentials and genuineness of transacting parties will foster greater online trust and will be an important driver of e-commerce.

3.2 Implications from studies

In an open and unknown market place with a high number of unknown participants, assurance and trust are difficult but very important. A 1998 Business Week survey showed that privacy is the number one consumer issue facing the Internet. According to the survey, 78% of online users would use Internet more and 61% of non-users will begin using the Internet if privacy practices were disclosed.

There is a growing body of research literature dealing with online trust, in which e-commerce is one prominent application. Several studies contend that e-commerce cannot fulfil its potential without trust (e.g. Jones, Wilikens, Morris, Masera 2000, Gefen 2000, Farhoomand and Lovelock 2001, Raisch 2001). Lee and Turban (2001) highlight lack of trust as the most commonly cited reason in market surveys why consumers do not shop online. The reason for this is that online sellers are not well known to the consumers, the consumer has no opportunity to physically examine the product before buying, and the consumer cannot protect any sensitive private or financial information that the seller receives (ibid). In research on e-commerce, trust is regarded as a mental short-cut to a buying decision, where the buyer is faced with the uncertainties of product quality and vendor reputation together with appropriate fund transfer (Grabner-Kräuter 2002).

On an open consultation on "Trust barriers for B2B e-marketplaces" conducted by the Enterprise DG Expert Group in 2002, several important barriers were identified. From the report we can find that the most important trust barriers are issues regarding the technology (security and protection), trust marks and dispute resolution absence, online payments support, lack of relevant information about partners, products, contract and standardization issues.

A trust building process must be set up to resolve these issues. Trust usually is conceptualized as a cumulative process that builds on several, successful interactions (Nicholson et al. 2001). Each type of process increases the perceived trustworthiness of the trustee, raising the trustor's level of trust in the trustee (Chopra and Wallace 2003). It is not known exactly what trust-building processes are relevant in an ecommerce context. It is suggested that, in this setting, trust-building is based on the processes of prediction, attribution, bonding, reputation and identification (Chopra and Wallace 2003). Reputation has a very high relevance in a trust-building process on e-commerce markets (e.g. Atif 2002). According to the Chopra and Wallace classification, identification based trust refers to one party identifying with the other, for example in terms of shared ethical values (Morgan and Hunt 1994). Identification builds trust

when the parties share common goals, values or identities. In e-commerce, these attributes perhaps may relate to corporate image (Chopra and Wallace 2003) or codes of conduct.

There is also a lack of empirical knowledge about how trust in the e-marketplace impacts on buyer-seller trust (Pavlou 2002, Pavlou et al. 2002). As an example, the role and importance of institutional arrangements that B2B e-marketplaces offer in order to build buyer-seller trust and increase liquidity is not known (Pavlou et al. 2002). Although, some investigations (Lancastre & Lages 2006, Kuttainen 2005) conducted later, show several evidences of trust impact. It can be summarised as follows:

- trust has a significant positive direct impact on buyer–supplier cooperation
- trust has a significant positive effect on relationship commitment,
- supplier relationship policies and practices show a significant positive direct effect on trust,
- there is a significant negative direct impact of opportunistic behavior on trust,
- there is a significant direct effect of communication and information exchange on trust,
- perceived e-marketplace reputation is positively correlated to trust in the e-marketplace,
- trust in the seller/buyer is positively correlated to intention to buy/sell,
- buyer's/seller's trust in the e-marketplace is negatively correlated to perceived risk,
- trust in the e-marketplace is positively correlated to commitment to the e-marketplace,
- trust in e-marketplace is positively correlated to satisfaction with sellers/buyers in the e-marketplace,
- trust in the seller/buyer is positively correlated to satisfaction with sellers/buyers in the e-marketplace (The relationship between trust in the seller/buyer and satisfaction with sellers/buyers is weakly to moderately strong (R=0,40) but statistically non-significant (p = 0,16). This result contradicts that of Pavlou (2002),
- results of the positive correlation of perceived monitoring and feedback to trust in the buyer/seller are contrary, by Kuttainen (2005) were not statistically significant in contradiction to Pavlou (2002). But it was explained by no practical experiences of respondents.

These results were more focused on trust impact than on factors which build trust. This absence will be examined in our research.

4 Trust building mechanisms

As we saw from the section above, trust is most important for supporting cooperation and commitment. For providing trust as a driving factor, trust building mechanisms must be identified. From several researches and reports conducted in recent years, we have identified the set of mechanisms needed for trust, which we need to analyse with regard to the level of significance to trust building, especially for P2P e-marketplaces. Every mechanism has its own specifics and must be analysed separately to find the best strategy for implementation into a particular e-market solution.

One of the most mentioned preconditions to trust is improving identification of potential business partners, what can be called credibility assessment, where a range of information must be verified by trusted subject. For this purpose, several trust marks have emerged on the Internet, which has to prove fulfilment of agreed necessary information. To enhance trust and basic trust marks, the next elements for improving confidence in e-business were identified, esp. reputation mechanisms, online dispute support, standardization activities, contract execution support and escrow services.

4.1 Trust elements

4.1.1 Technology trust

Security of information or systems is often assumed to be part of the trust transaction. It is assumed that a secure system, such as a web site, makes the security of money and information dependable, and ultimately creates trust. Furthermore, the characteristics of the web provider's site are widely regarded as having an impact on initial consumer trust towards the service provider. In an experimental study of a web site offering legal advice, the investigators discovered that perceived web site quality positively influenced trust in a web vendor. In other words, among consumers interacting with a web site, the first impression of the web site strongly affects trust in the vendor behind the site. Web site ease-of-use and usefulness also appear to predict trust in the e-commerce setting.

The main technical mechanisms that have strong influence on the trust in the e-commerce environment include identity management, access control and data encryption and security.

Identity management

An identity management system provides the tools for managing partial identities in the digital world. Partial identities are subsets of attributes representing a user or company, depending on the situation and the context. Each company may want to decide which partial identity to use in his relationship to the communication partner. Sometimes different names, either nicknames or pseudonyms are bound to the chosen partial identity.

Identity management systems must support and integrate both techniques for anonymity and authenticity in order to control pseudonymity and liability of users. The first one refers to the lack of correlation between pseudonyms and their holders, meaning that the linkage of a pseudonym and its holder is not publicly known. This particular characteristic depends on their use in different contexts. If the same pseudonym is used in many cases, the corresponding data about the holder, which is disclosed through each use, can be linked. On the other hand the liability of a user must be controlled. A pseudonym can be authenticated in a secure way and based on this, can be used to authorize the use of specific services.

The user-side identity management systems can be classified based on the identity model in use:

- Isolated user identity model: In this model the service providers are used for the distribution of both user identifiers and user credentials. It is the most common identity model in use; each service provider has its domain name and in most cases the users are identified by a user name and a password.
- Federated user identity model: In this model a user can be identified by all the service providers placed into the federation domain. This is based on agreements between the service providers, resulting in a user identified into one service provider domain becoming identifiable, based on specified policies, by the other service providers within the federation domain. So, mapping between the identifiers across the various service provider domains is required.

- Centralized user identity model: In this model the identity management is provided by a centralized entity. It can be further separated into the following categories:
    - Common user identity model: A separate entity is used for the provision of identifiers and credentials to the service providers.
    - Meta user identity model: The service providers' specific identifiers are mapped to a common meta-identifier.
    - Single Sign-On (SSO) identity model: Using this identity model, the user needs to sign-on (i.e. authenticate himself) once to get access to provided services. A separate single entity is used for identifiers allocation, credentials issuing and performing the actual authentication.
- User-centric user identity model: The users store identifier and credentials into a hardware tamper resistant device, a smart card or any other portable personal device, called Personal Authentication Device (PAD). This user-centric identity model can be combined with all the previously mentioned identity management models. The user only needs to authenticate himself to the personal device and then the device take the role of user into the authentication process with the service providers.

Access Control

Access control is the process of limiting access to the resources - information or services provided by the system only to authorized users, programs, processes, or other systems. In general, it is defined as the mechanism by which users are permitted access to resources according to their identities authentication and associated privileges authorization.

- Discretionary Access Control (DAC) - is a means of restricting access to resources based on the identity and need-to-know of users and/or membership in certain groups. Two important concepts in DAC are:
    - Resource ownership: Every resource in a system must have an owner. Normally, the owner of a resource is the user who created the resource.
    - Access rights and permissions: These are the controls that an owner can assign to individual users or groups for specific resources.
- Mandatory Access Control (MAC) - security labels or classifications are assigned to system resources that allow access only to entities (people, organizations, processes) with distinct levels of authorization or clearance. These controls are enforced by the security component of the system and the administrator of the system defines a policy, which users cannot modify. This policy indicates which subject has access to which object (i.e. which company can access which information). MAC can increase the level of security, because it is based on a policy that does not allow any operation not explicitly authorized by an administrator.
- Role-Based Access Control (RBAC) - permissions are associated with roles and users are assigned to appropriate roles. It ensures that only authorized users are given access to certain data or resources. A role is a semantic construct forming the basis of access control policy. It is essentially a collection of permissions, and all users receive permissions only through the roles to which they are assigned. Roles can be organized in hierarchy and can inherit their own permissions. Another useful extension is to allow constraints to be associated with role activation (i.e. to activate some role in the particular business mediation phase only).

Data encryption and security

Cryptographic algorithms are commonly used to ensure that no unauthorized entity can read and understand the original information.

Cryptographic algorithms can be classified in two major groups: symmetric and asymmetric key algorithms:

- Symmetric key algorithms use the same key for both encryption and decryption. They are usually faster to execute, but require the sharing of the secret key between the sender and the

receiver. Therefore, when communication has to be established for a group of nodes, the system usually faces scalability issues because each sender-receiver pair should share a key. Moreover, if a sub-set of the nodes group relies on a unique key, the global system becomes vulnerable if only one of those nodes is compromised.

- Asymmetric (or public) key algorithms rely on two different keys for encryption and decryption. They are based on some mathematical principles which make it infeasible or impossible to obtain one key from another. In this way, one of the keys can be made public while the other is kept secret (i.e. private). This is called public key cryptography.
- One of the major issues related to cryptographic keys is to secure their management in order to ensure their administration. The main key management schemes are key pre-distribution, key arbitration, and key agreement:
    - Key pre-distribution schemes aims at distributing keys to all the nodes before communication establishment. Such approach induces less communication and computation. However, all the nodes have to be known in advance.
    - In key arbitration schemes, a particular node, the arbitrator, creates and distributes keys among all participants. Such a scheme implies that the administrator node needs to be always reachable and to have sufficient computational and power resources.
    - Key agreement schemes are mainly based on asymmetric key algorithms. Such solutions aim at enabling the agreement on a secret key between two or more nodes. In group key agreement schemes, each participant contributes a part to the secret key.

4.1.2 Trust marks

Trust marks as a trust logo emerged in e-commerce some years ago to imply that a well-known, major company had adequate knowledge of and faith in the retailer's legitimacy to grant a merchant account. Such a trust mechanism was eventually not enough for most consumers and served to direct effort toward more valuable signs and symbols. The second step was more technology focused as some security seals were provided by technology companies (e.g., Verisign, Baltimore, and Entrust). Other marks focused on business attestation rather than specific technical security; they covered privacy, authenticity, business practices, etc. Typically they were the outcroppings of existing off-line symbols, although Internet-specific brands also developed. The most successful new organization was TRUSTe, which conducted audits and provided a seal for those entities that passed its scrutiny. The migrated version of the Better Business Bureau's seal of approval was a prominent example of an organization's existing reputation – for impartiality and consumer advocacy – being successfully applied on the Web. A third significant trust mark solution to this Internet trust deficit was the WebTrust seal granted by The American Institute of Certified Public Accountants and the Canadian Institute of Chartered Accountants. This seal could only be acquired after a thorough independent technology and business audit. In each case, the result was a visual manifestation of derived trust based on the logic that, "You, the consumer, know and can trust us, the third party auditor. We say the Website is trustworthy, so you can feel alright doing business with it. "Such an approach is also useful for building institutional trust. After the boom of B2C and C2C platforms on the Internet, the importance of credibility and trustworthiness at a distance increased significantly.

For the future, new generation trust marks are expected – trust marks, which integrate all trust issues especially a glaring trust deficit in user authentication; reaching the mass market with a sure means to validate and verify Web activity integrity; and a means of adding certainty to the transactional history of a Web-based interaction. Developing a trust mark for building the trust between business participants on particular online business platform can also increase trust in this platform (as an institution) and can be naturally used as trust mark for the platform itself.

Credibility assessments made by reputed and neutral organisations on various aspects of the online market especially from socio-economic aspects can substantially improve the confidence of the online participants. One example of a trust mark regarding e-commerce is Eurolabel (although it is focused on B2C).

4.1.3 Information quality

One of the most crucial requirements for achieving trust is trusted information published on e-markets. Information quality relates closely to the socio-economic dimension of trust and because of different types and specifics of business information, also the means of trust provision is different (e.g. identification data about companies, product information and description, certificates of quality etc.). On the other hand, people judge information quality as different from information content (Wathen and Burkell 2002). If the information is of uncertain quality, a person is vulnerable to errors in his or her decision making (Chopra and Wallace 2003). Thus, information quality determines if a user will be influenced by and act upon the provided information (e.g. Deelman and Loos 2002, Chopra and Wallace 2003, Tan and Thoen 2001), which can affect volume of trade on e-marketplace.

Information quality in an anonymous online environment can be regarded as a visual manifestation of trustworthiness attributes, essentially competence and goodwill. A number of information quality attributes are suggested in the literature, among them accuracy, currency (timeliness), coverage, credibility (or believability) and depth (Alexander and Tate 1999, Tseng and Fogg 1999, Naumann and Rolker 2000, Rieh 2002, Wathen and Burkell 2002, Chopra and Wallace 2003).

According to the Trust Barriers Report, the following information is required by the users (both buyers and sellers) of the electronic marketplaces. The following percentage represents users stating, that the lack of relevant information can hinder online trust.

- Information relating to participant's identity (name, address, VAT) 92.9%
- Information on the goods and services offered 71.4%
- Information on the prices of goods/services – including additional charges 67.9%
- Information on availability of products and delivery time 42.9%
- Information on payment methods 42.9%
- Information on terms and conditions of the contract (eg. Applicable law, jurisdiction) 39.3%
- Information on the language of the transaction 39.3%
- Information on the costs of delivery of goods/services 35.7%
- Information on certification of products/services 35.7%
- Information relating to steps in the conclusion of the contract 28.6%
- Information on insurance of goods/services 14.3%
- Information on product return and recovery of monies paid 14.3%
- Information on right of withdrawal from contract 14.3%

The important issue is to find the trusted source or trusted party which will validate such a information.

4.1.4 Certificates

Business processes, procedures and activities differ depending on the country´s habits and customs. This is the reason for standardization of mentioned activities to ensure that the company is able to operate at the required level of quality. On the other hand, certificates could award best goods and services or procedures on a national or international level. We can spread certificates into several groups:

- International (standardized) certificates
- National certificates or awards for domestic companies
- Certificates or awards of foreign companies

International certificates

International certificates provide a means of verifying that a proposed developed standard has met certain requirements for due process, consensus, and other criteria. As an example we should name ISO

(International Standards Organization – www.iso.org[1]) certificates. International certificates are well known and claims that a company with the certificate reached a respectable level of quality and is a trustworthy partner for business activities. Another example within textile industry is the Öko-Tex certificate, which is offered by the AITEX organisation (www.okotex.com).

National certificates or awards for domestic companies

National certificates are most common type of certificates of quality. Usually, companies have some support from the local organizations to obtain local certificates in the easier way.

"Slovak Gold Certificate" – An example of a national certificate

Slovak Gold represents an assessment system. The mission of this system is to assess and certify the standard quality production and to promote it in the common European market using the Slovak Gold Brand.

The Slovak Gold Foundation is the guarantor for this system and performs other activities contributing to social-economic development, protection of environment, consumer protection and consumer health, to the development of cultural and intellectual values and to a general increase in the quality of life. (www.slovakgold.sk/index.php?lang=EN).

Each certified product or service shall acquire the right for 18 months to use the Slovak Gold Brand under the condition that it maintains a stable level of quality. In the case of a reduction in quality, the Brand can be withdrawn.

Certificates or award of foreign companies (or national certificates pronounced to foreign companies)

In this group of certificates, there is the possibility of indicating quality and a business partner guaranteed by known national certificates (which were awarded to a foreign company). Foreign companies, especially micro, small and medium companies could incur a rise in costs and therefore it is better to use already acquired certificates. One possibility is using a national certificate from an organization which is part of an international network. This means that the quality is proven by a foreign third party and trustworthiness is secured by membership to an international network.

4.1.5 References

References are generally considered an important part of trust building mechanisms. They refer to past trading activities between business partners and these activities could be very simply verified by contacting a listed partner.

According to past company trading, in a "traditional" environment, e-markets could provide a list of the references of the key partners selected by the users. Optionally, it is up to a partner to approve reference to his company. It is not required that the key partner should be registered in the e-market or platform, but in this case, it is not possible to check validity of provided references within the e-market.

After some time, companies evidently create business relationships with partners registered in the e-market or platform and at that time could list references which are generated directly from the platform. This kind of reference should provide information about company trading behaviour and habits.

4.1.6 Reputation mechanisms

Reputation is considered a trust-building process which is highly relevant in e-commerce markets (e.g. Atif 2002). With reputation is understood the process of transmitting an image of an actor in a network of other actors (Conte and Paolucci 2002).

[1] ISO (International Organization for Standardization) is the world's largest developer of standards. Although ISO's principal activity is the development of technical standards, ISO standards also have important economic and social repercussions. ISO standards make a positive difference, not just to engineers and manufacturers for whom they solve basic problems in production and distribution, but to society as a whole.

Reputation is defined as an estimation by others of an "entity's willingness and ability to repeatedly perform an activity in a similar fashion" (Herbig, Milewicz, and Golden 1994).

In e-commerce specifically, reputation concerns both buyers and sellers. It is obtained from offline sources and online ratings (Chopra and Wallace 2003). Offline sources are presented by references.

Rating

Online ratings could be presented as positive or negative ratings according to the experience with individual business case. Feedback presented by rating is trust-building mechanism with some empirical support for its effect on buyer-seller trust. Feedback refers to a mechanism for providing reliable information to buyers about sellers' past trading activities (Pavlou 2002, Ba & Pavlou 2002)

According to Sundaram and Webster (1998), negative messages have a detrimental effect on unfamiliar brands. Lee et al. (2000) report that higher negative feedback ratings lead to lower bidding prices in Internet auctions. Given that most sellers have not established any name recognition, negative feedback is likely to have a very strong negative effect on a buyer's trust perceptions, which is most likely to supersede the effect of positive feedback. Thus, the negative ratings have a greater opposing weight than positive ratings in shaping buyers's trust in a seller's credibility.

Buyers will calculate that a more reputable seller is less likely to destroy a good name to exploit a single transaction (Scott and Derlaga 1983). They will assume that sellers who have accumulated a good reputation would incure a high cost from cheating behaviours, and thus would be less likely to act opportunistically. It means, a greater number of positive ratings induces stronger buyers trust in the seller's credibility when there is no negative feedback.

As mentioned above, in order to make better decisions in partner selection, buyers are naturally asking and looking for negative ratings or references. This issue is very sensitive because of the fear of unfair partner's activities. According to Dellarocas, from Massachusetts Institute of Technology, USA, several unfair ratings can be identified (Dellarocas 2000).

Unfair ratings by buyers:

- Unfairly high ratings ("ballot stuffing"): A seller colludes with a group of buyers in order to be given unfairly high ratings by them. This will have the effect of inflating a seller's reputation, therefore allowing that seller to receive more orders from buyers and at a higher price than she deserves.
- Unfairly low ratings ("bad-mouthing"): Sellers can collude with buyers in order to "bad-mouth" other sellers that they want to drive out of the market. In such a situation, the conspiring buyers provide unfairly negative ratings to the targeted sellers, thus lowering their reputation.

Discriminatory seller behaviour:

- Negative discrimination: Sellers provide good service to everyone except a few specific buyers that they "don't like". If the number of buyers being discriminated upon is relatively small, the cumulative reputation of sellers will be good and an externality will be created against the victimized buyers.
- Positive discrimination: Sellers provide exceptionally good service to a few select individuals and average service to the rest. The effect of this is equivalent to ballot stuffing. That is, if the favoured group is sufficiently large, their favourable ratings will inflate the reputation of discriminating sellers and will create an externality against the rest of the buyers.

Dellarocas also proposed several techniques for eliminating unfair ratings such as Median filtering - Calculation of reputation estimate using the median of the ratings set, or Frequency filtering - Ignores raters whose ratings submission frequency for a given seller is significantly above average and eliminates raters who attempt to flood the system with unfair ratings; maintains the final ratio of unfair raters at low levels.

Forum

A platform feedback forum is another tool for building trust between buyers and sellers. Users can evaluate the services provided by their business partners. A user can leave feedback to its partners based

on the business outcome. By reading these feedbacks users are able to form a baseline of trust required before a contract could be made.

The provided ranking mechanism must not be biased to the positive or to the negative assessment. Potentially, the party being commented can also be allowed to explain the situation and problems regarding to the comments made by another party.

Approaches to the construction

For the reputation mechanisms implementation, three basic approaches will be presented - 1) statistical analysis of past transactions, 2) network of trust models, and 3) rule-based mechanisms:

Statistical analysis of past transactions - The best known methods presenting methods that aggregate ratings based on statistical analysis of past transactions are collaborative filtering mechanisms. The major problem with methods that statistically analyze past ratings is that they require a substantial amount of data to obtain useful results. This may not be a problem for C2C e-commerce merchants, such as Amazon.com, but could pose some difficulties in B2B e-commerce, especially during a start-up phase.

The "network of trust" - Some researchers (Zacharia et al., 1999) have proposed formalizing people's "networks of trust" – the concept of trusting a friend of a friend – into rating applications. It results from the assumption that people tend to trust the friend of a friend more than someone unknown. The strength of such a solution is that it can build upon existing relationships, which could be important for a B2B community. This solution has problems however. It is difficult to measure the trust that a user attributes to the members of his or her "Network of Trust." In interviews with industry decision-makers, it was found that the attitude towards the idea of a network of trust varies considerably. For some interviews, the concept of trusting "a friend of a friend" seemed intuitive, while others did not consider it to be relevant whether they and an unknown rater turned out to have a common friend. A second problem is that the most common approach (e.g., (Zacharia et al., 1999)) is to use a single dimension to model trust, combining both a party's trustworthiness as a business partner (Will he cheat in business?) and credibility as an evaluator (Can I trust what he is saying?).

"Rule-based mechanisms" constitute another important type of rating filters. Abdul-Rahman et al. (2000) propose the deployment of rules to determine and update rater weights. These rules assess whom the user trusts based on outcomes of previous interactions. The problem with this approach is that the rules tend to be ad-hoc. For example, if user A believes that rater B's rating of Supplier C is inaccurate, should A's trust in B decrease by 0.6 or 0.4?

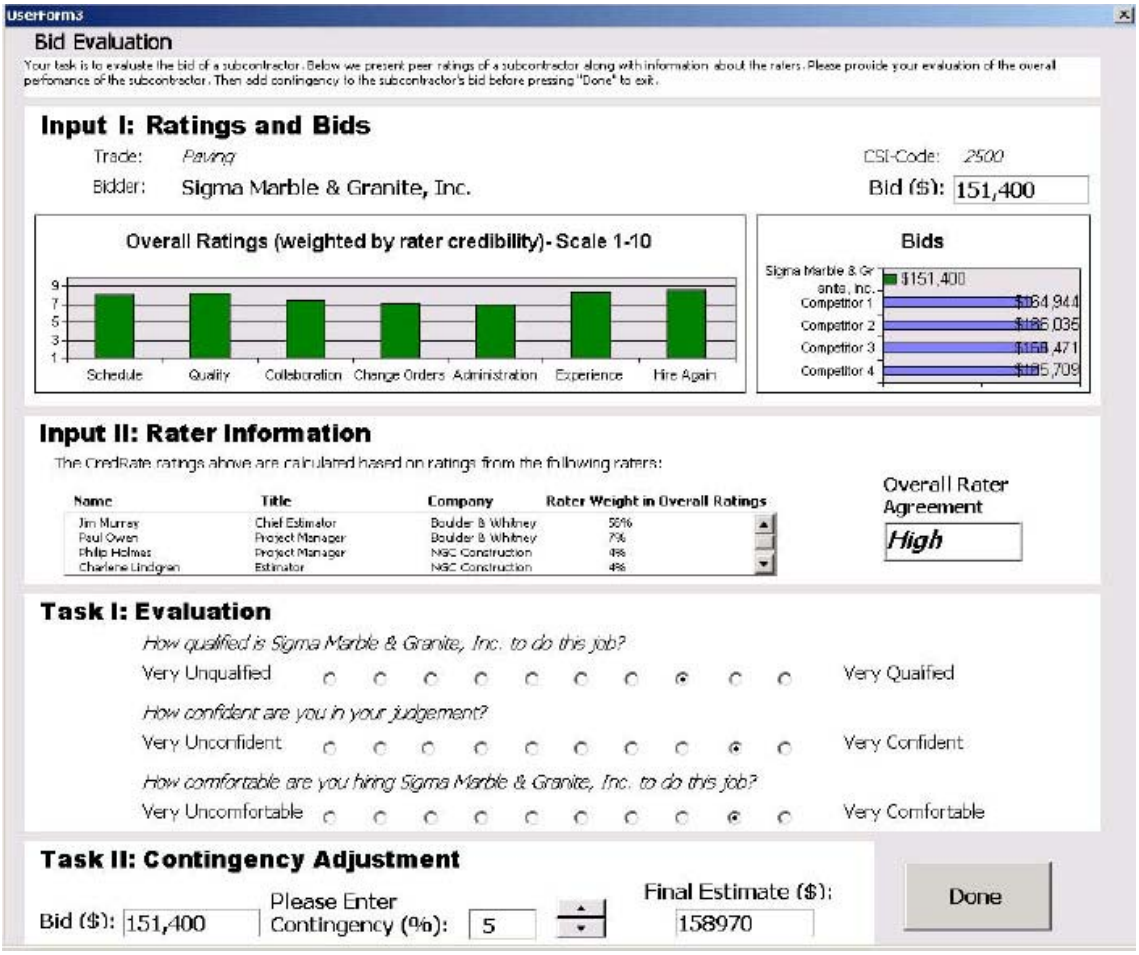


Fig. 2 *Example of reputation building*

Source credibility theory (Ekström 2003) can serve to overcome the three above listed problems associated with alternative approaches to rating mechanisms. First of all, source credibility theory provides tested frameworks (e.g.,Birnhaum and Stegner, 1979) for aggregating ratings from different sources. These frameworks decrease the dependence on ad-hoc operators. It also provides validated scales for measuring a source's (rater's) credibility (McCroskey, 1966); these can serve as the key input parameter in a rating system based on source credibility. Finally, the weights in a rating based on source credibility theory depend on user preferences and not on rater's behaviour, which decreases the amount of data required to calibrate the rating application. The opportunity to measure the credibility of the rater's organization as well as the person further decreases the amount of user input needed. An example of reputation building is in Fig. 2.

4.1.7 Contract execution support

A contract is a legally enforceable agreement in which two or more parties commit to certain obligations in return for certain rights (Reinecke 1989). In a B2B context this can range from a simple one-page purchase order for the sale of goods, to an extremely complex thousand page document for a trade level agreement between multinational businesses.

There are up to four elements needed to create a valid business contract (Reinecke 1989). First, an agreement has to be reached on all essential conditions of the contract. The second element is the notion of consideration. Each party establishes the obligation to give something to each other. Consideration can take the form of money, services rendered, property or individual rights. The third element is that of capacity (or competence): ensuring that parties entering into the contract are lawfully capable of agreeing

to contracts (e.g. whether an individual has the authority to represent their organization). Finally, the legal purpose of the contract must be established. A contract cannot be enforced unless the actions agreed upon are legal in the jurisdiction where the contract is made. In general, each of these elements will appear in a business contract as clauses covering (Fosbrook & Laing 1996):

- The description of parties involved, including: names, addresses, roles etc;
- The definition and interpretation of terms used in the contract;
- The jurisdiction under which the validity, correctness, and enforcement of the contract will operate;
- The duration and territory of the contract, which defines the times and places at which the contract is in force;
- The nature of consideration e.g. fees, services rendered, goods exchanged, rights granted, etc;
- The obligations associated with each role, which is expressed in terms of the criteria over the considerations. This includes terms and conditions for invoicing and payment such as warranties, delivery, liability, rejection, termination and accounting provisions.

A sample contract illustrating these elements is provided in Annex 3. Example of XML Encoding of Sample Contract is presented by Goodchild (2000).

In the context of B2B, many of the terms and conditions in the contract determine the requirements of software of a B2B system, e.g. the terms and conditions agreed for invoicing and payment will affect the forms of electronic invoices, time of sending and payment etc. But, many terms and conditions are difficult to implement and would require human actions and interventions, at least partially. Although according to some research, SMEs generally don‘t trust technology and automation, it can significantly support a contract proposal and execution in an effective and trusted way. Significant savings can be achieved by reusing standard form contracts for newly established contract agreements (Trietel 1995) or by integration of data negotiated in some online negotiation mechanism into the contract proposal. Standard form contracts/templates are also available for a fee from commercial organizations or some international institutions (e.g. http://www.legaldocs.com/, http://www.iccwbo.org/), which provide general-purpose contracts for many business situations (Fosbrook & Laing 1996).

In terms of B2B, standard form contracts are essential, as they allow business to confidently operate at arms length. A business can conduct next businesses without the need to negotiate a new contract for each transaction. Furthermore, the standardized nature and the regular use of standard form contracts means that many elements are stable enough to be implemented as components in a B2B system. Together, they can reduce mistakes by typing important information. Finally, as many standard form contracts share similar elements and contract clauses, there exists the possibility of reusing components in different B2B systems and for different business subjects.

The legal enforceability of a contract require issues such as fraud, transmission and receipt of messages, evidentiary concerns, prior terms and conditions, dispute resolution agreement and liability due to failures or malfunctions.

In order to achieve an efficient contract proposal and execution platform, the following issues must be addressed:

- Negotiation that can be used to mediate the negotiation of contracts in the pre-contractual phase. Automated contract negotiation is another area with significant challenges and include RFx, auctions, exchanges and other forms supported partner selection and contract development.
- Recording and storage of standard form contracts and standard contract clauses.
- Notification and storage of signed instances of standard form contracts which can later be used as evidence of agreement in contract monitoring and enforcement activities.
- Monitoring of the activities of parties by measuring their conformance to contractual terms and conditions and signals the contract enforcer if it detects a violation.

- Enforcing actions such as sending a message to various parties informing them of the violation and possibly preventing further access to the system by non-conforming parties. This issue is related to online dispute resolution, which can be integrated into the contract platform (see the process on Fig. 3)
- Validation of legally valid contract instances by checking the four aspects of contract validity, as validated identity of subjects and usage of negotiated data, competence/willingness to enter a contractual relationship, clarity of contract semantics which is provided by templates.

Some elements of contract validation are very difficult for a computer to perform. For example, the clarity and legal purpose elements are difficult to model and verify in complex form. One approach to address this problem is to establish some systems of credentials that would guarantee legal validity of contract templates, negotiated data and identity of subjects.

4.1.8 Online dispute resolution

The rapid growth of electronic commerce increases the potential for conflicts over contracts which have been entered into online (e.g. about price, late delivery, defects, specifications ...). The use of online dispute resolution (ODR) mechanisms to resolve such e-commerce conflicts is crucial for building consumer confidence and permitting access to justice in an online business environment.

Online Dispute Resolution (ODR) is a branch of dispute resolution which uses information and communication technology to replace the traditional out of court processes to facilitate the resolution of disputes between parties. It primarily involves negotiation, mediation or arbitration, or a combination of all three. In this respect it is often seen as being the online equivalent of Alternative Dispute Resolution (ADR). However, ODR can also augment these traditional means of resolving disputes by applying innovative techniques and online technologies to the process (Hörnle 2004).

For the purpose of dispute resolution processes different types of security issues are necessary, such as the integrity and confidentiality of sensitive data and communication mechanisms used to transmit and store this data. ODR procedures can also be automated, avoiding human interaction to a high degree and be conducted entirely online. Efficiency gains arise from automation in terms of speed and low cost. The automation of information management makes dispute resolution more efficient, while communication tools overcome distance.

ODR procedures

There is an enormous variety in the emerging picture of ODR providers with varying experimentation and different degrees of formality. Various procedures are used. The following is to give an overview of the procedures used:

Arbitration is a procedure whereby a neutral (or a panel of neutrals) makes a decision binding on the parties. The process involves fact-finding (whether through a hearing or by submission of documents) and the neutral arbitrator or panel making a ruling, just like a court. Furthermore this ruling can usually be directly enforced in the courts. Thus, arbitration is similar to litigation, the main difference being that the parties can choose the arbitrator and the basis on which the arbitrator makes the decision. The parties can choose the procedure which governs the proceedings. When arbitration is considered it is important to have a suitable dispute resolution clause in legal contracts to avoid future refusal of such a resolution. As arbitration seems to be most difficult from other ways of ODR procedures, it may be a good idea to use online arbitration as the last resort layer of a scaled approach to ODR. A dispute resolution clause should provide that the parties start with negotiation and if this fails, move on to mediation and only if this fails will they resort to arbitration (see Fig 3).

Evaluation (non-binding) is an ODR technique involving the neutral making a decision on the basis of the written submissions and documentary evidence provided by the parties. However, in the case of evaluation this decision takes the form of a non-binding recommendation. Thus evaluation does not result in a binding, enforceable decision. This factor may make it easier to secure the participation of the other side after a dispute has arisen.

Mock trials (also: summary jury trials) are an ODR process whereby a jury of peers makes a non-binding determination of the issues via a web-based platform. The facts and relevant documents are available on a

platform, which are accessible to Internet users registered for a particular case. Thus the neutral is replaced by a number of volunteers (Internet users) acting as if they were an online jury in a civil trial. All communication takes place via the website, see for example iCourthouse (www.i-courthouse.com).

Mediation is an out of court process, which involves a neutral mediator brokering a settlement between the disputants. The role of the mediator is to enable the parties to communicate effectively by rephrasing their arguments and by helping the parties to overcome any impasses. Mediation can take place in a meeting between the parties or with the mediator talking to the parties in turn ('shuttle mediation'). The crucial point about mediation is that the mediator does not make a decision or impose a solution on the parties. The process is entirely voluntary so that either party can walk away at any time and the settlement is only binding once both parties have formally agreed to it.

Online mediation seems to be the primary ODR method. There are four reasons for this primacy of online mediation. First, the process is flexible. The mediator essentially uses his skill to help the parties to communicate and reach their own solution. This high degree of party control means that the parties are likely to feel comfortable with the online procedure. Secondly, the fact that participation is voluntary means that the parties are more willing to participate as they do not compromise their position. Thirdly, redress is not limited to monetary awards. Online mediation allows the parties to find creative solutions to their dispute. By way of example, an adequate response to a complaint against a supplier could be a substantial discount from a future purchase or something similar.

One of the disadvantages of online mediation is that the effectiveness of the procedure depends on the wish to maintain good customer relationships. This might be a problem if this was the only instance in which the complainant bought from this supplier. Another issue with online mediation is that the involvement of a human mediator means that the procedure may be too expensive for very small value claims.

Automated Settlement Systems are a highly innovative form of ODR, suitable for monetary claims (i.e. where liability is not disputed, but only the amount of compensation is at stake, such as certain insurance cases). Automated Settlement Systems may also be used as a negotiation tool as part of another dispute resolution procedure. The process involves the parties making successive blind bids. This means that the bids are not disclosed to the other party. Once the bids are within a certain range of each other (e.g. 30%), settlement will automatically be reached, for the median amount. The process is driven by software so that no human third party is directly involved and is therefore particular cost-effective. The software keeps offers confidential until they come within the range. Communication tools such as email and web-based platforms support the settlement process.

Complaints Assistance provides the parties with tools allowing for effective communication. At a minimum, it allows a consumer to make a complaint and communicate a demand for redress to the respondent. It is worthwhile for any supplier to consider using online web-based forms for complaints and develop an automated system to respond to such complaints.

Independent ODR schemes and trustmark schemes, where some ODR are independent in the sense that any claimant can use them to seek redress. In other words, these schemes offer their services to claimants regardless of how the dispute has arisen and regardless of whether either party is a member of that scheme. The main advantage of such schemes is their open access. On the other hand, this open access entails several disadvantages. The first one is funding. If the service is not financed by membership fees but by the users of the service, the ODR service may be too costly for small claims.

Other ODR providers offer membership schemes. Members undertake to co-operate in the dispute resolution offered by that ODR provider and pay a small fee. In return, the member is allowed to use the trustmark (a symbol) on its website and stationery signifying that it is participating in ODR. The idea behind the trustmark is that this enhances the branding of the members and enhances trust. At present the ODR services offered by such trustmark schemes are mainly limited to mediation.

Online techniques

Document management can be useful where a settlement agreement is negotiated or an award is deliberated between the arbitrators by exchanging a "travelling draft" (e.g. for word searches within a text or the tracking of changes). A Travelling Draft is a document which is in the process of being agreed between different parties by each party marking the suggested changes directly on the document. IT has

improved legal drafting aids and computerised precedent databases now belong to the standard tools of lawyers. Finally, translation software or ontology for multilingual support supports the translation of documents, an important factor in international, multilingual disputes.

Online techniques for mediation and evaluation include emails and online platform with various tools allowing for written and oral communication and discussions, with tools such as online chat, (synchronous discussion) or threaded discussion boards (asynchronous discussion), virtual conference room, etc.

Another tool useful for mediation is negotiation software assisting the parties in refining the issues. One example of negotiation software is automated blind bidding. This software allows the parties to make several monetary offers and demands respectively and if the offer and demand are within a certain reach of each other, settlement is reached at a median amount. The successive bids are not disclosed to the other party. Such software can assist in avoiding posturing and conflicts 'over the last few pennies'.

One extremely useful online technique especially for arbitration is electronic file management, especially for complex, large-scale arbitration. Electronic file management means that all documents pertaining to the case in question are stored electronically in a systematic order. Electronic file management software permits individual documents or passages to be easily retrieved, displayed or printed, cross-referenced, compared, annotated and searched for keywords.

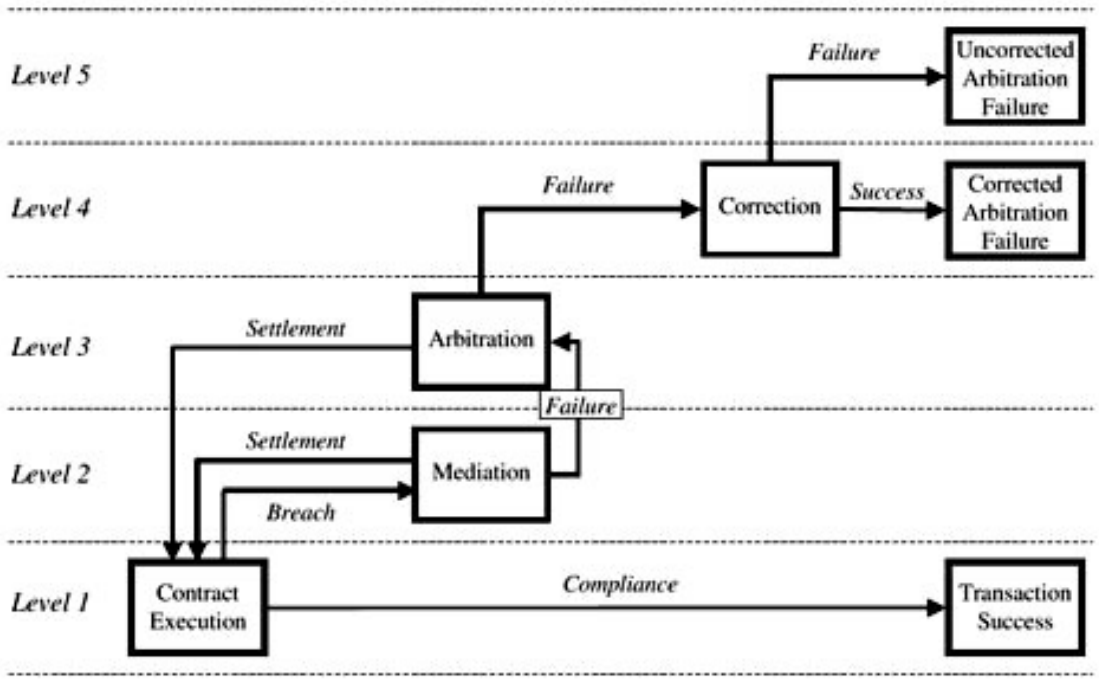


Fig. 3 *Enforcement of contract by mediation and arbitration*

Furthermore, an interesting online technique is the use of multimedia transcripts at face-to-face/ videophone hearings, allowing the participants to simultaneously see and hear the evidence but also to see the written transcript and case file on the screen in front of them almost instantaneously. Multi-media transcripts give each user a screen from which they can see the text of what is being said in court or during an arbitration and see any evidence which has been scanned in. The idea is that this enhances presentation and makes the evidence more comprehensible. The transcript can be searched and annotated on screen. Furthermore it is possible to connect to the hearing by a remote link. On the other hand, participants in the hearing, used to taking their own hand-written notes, may find it hard to accustom themselves to this procedure. In the end this is a matter of personal preference.

An example of the process of enforcement contract through ODR techniques is presented in figure 3. Level 1 reflects the fact that the transaction is executed according to the prescribed contract. Level 2 reflects the fact that the transaction has deviated from the prescribed contract, and warnings to non-compliant parties have been ignored. The Mediator/Negotiator attempts to establish an amended contract between the two parties. Level 3 reflects the fact that the mediation failed and was transferred to the Arbitrator, who collects all available evidence in order to reach the fairest decision possible. In case the decision by the Arbitrator is accepted by both parties, the contract execution returns to Level 1. Level 4 and 5 reflect unaccepted Arbitrator's decision by one party. In that case, penalties in reputation systems or shift to the traditional legal system are realized. After each level it is useful to use rating mechanisms to rate partners behaviour.

4.1.9 Escrow services

One of the frauds emerging in business relations is the breach of contract. On the one hand, a buyer may not transfer money after receiving the product; on the other hand, the supplier could send no product or the product does not meet the agreed terms. When buyers and sellers don't know each other, they need a third-party they can trust to avoid such a risk. Escrow services reduce the potential risk of fraud by acting as a trusted third party that collects, holds and disburses funds according to buyer and seller instructions. Escrow services are usually provided by a licensed and regulated escrow company.

Escrow services begin with an escrow agreement which is a written instrument which by its terms imports a legal obligation. The buyer, seller and the escrow agent all sign the escrow agreement, which states the conditions upon which the deposited items/funds may be distributed. The escrow agreement also stipulates, how, to whom and for which amounts the deposited funds/items will be distributed. The escrow agreement cannot be changed unless all parties agree in writing. The delivery in escrow is without reservation of power to recall, which means that an escrow agent must act according to the agreed-upon escrow conditions and disbursement instructions.

Escrow services provide security to both parties to the transaction: the seller retains a property interest to assure payment/performance by the buyer and the buyer obtains security that the property will be his/hers if the conditions in the escrow agreement are met. Because both buyer and seller agree to the escrow terms before the transaction, each party is clear as to how the transaction will transpire, and when funds will be distributed and to whom.

Present escrow services are providing different levels of complexity and integrate many services mentioned in former sections. For example scheduled date, place and time, validate identity of parties, witness execution, acknowledge documents, tracking and recording documents, document preparation and execution support, providing insurance etc. These services are providing for a small fee, for example 0.89% of the purchase price on Escrow.com, but it depends on the business model, purchase price and other conditions.

As such a complex and cost effective service improve trust and business for every kind of company, many e-marketplaces are forced to think about its implementation.

4.1.10 Standardization

Service agreements: Code of conduct, Terms and Condition Agreement and Service level agreement

A code of conduct outlines a service standard that the user of that service can expect to receive when dealing with an organization and stipulates what the user should do to qualify/become eligible to engage or receive the particular service. Codes of Conduct are not legislated and act more as guidelines.

Terms and Condition should be part of every marketplace where different participants need to agree terms, conditions, rules and implications of uncommon/unfair practices. Service level agreements, between e-marketplaces and their participants, dictates rules regarding the integrity of e-marketplace services, their availability and performance. A Combination of all mentioned service agreements is necessary for all parties involved in business processes on e-marketplaces (e-marketplace participants and service provider).

The report "Applying Codes of Conduct and Trust Marks" by eMarketservices show best practices and provides guidelines for developing an efficient Code of Conduct. The checklist is provided in Annex 2.

Ontology

According to the definition, ontology is the shared specification of the conceptualization and the context of information systems, ontologies are used to represent knowledge about the domain in a standardized way. In the context of e-business application, it can support multilingual standardization of exchanged data.

4.1.11 Trust mechanisms convergence

Many mentioned services and tools are not suitable separately. Most of them are synchronised into the symbiosis of interlinking and complex trust services. For example, it is suitable to combine escrow services with contract execution support and ODR services as they deal with the same documents, information and business procedures.

4.2 Institutional trust

Institution-based (or institutional) trust is yet another relevant trust-building process in a B2B e-marketplace context. This is because the e-marketplace or any online business environment itself is an institution. The e-marketplace can put on platform its own processes, standards and norms for managing transactions, thus institutionalizing them. An example of institutional trust builders is the monitoring of transactions, assistance for resolving conflicts, and the enforcement of proper conduct (Pavlou 2002, McKnight and Chervany 2002, Pavlou et al. 2003, Gefen et al. 2003).

Institution-based trust is most important, when the parties which have entered the business platform have no previous experience of each other (Pavlou et al. 2002). Zucker argues that in an economic environment where the actors do not share similarity or familiarity with each other, institutional trust is the most important creator of trust (1986, in Pavlou 2002, and Pavlou et al. 2002). McKnight and Chervany (2002) and Castelfranchi and Tan (2002) note that, in a novel situation such as considering a purchase from an unknown company as potential business partner, a high level of institutional trust can reinforce interpersonal trust. The result is an increase in the buyer's combined trust in the vendor on online environment.

The concept of institutional trust is closely related to the notion of third-party trust or mediators in P2P networks in B2B. Trusted third-parties are independent controlling, co-managing or certification authorities, certifying legal procedures and technical standards in order to avoid contract disputes among business partners. Empirical evidence indicates that third-party seals increase an e-vendors perceived trustworthiness in the eyes of potential buyers. The seals represent organizations that assure privacy, e.g. BBB, processes, e.g. WebTrustee, or technology, e.g. VeriSign. Third-party seals build on the process of transference, which means that a trustor concludes that an unfamiliar person or organization is trustworthy because it is associated with a known and trusted third-party (Kimery and McCord 2002). Presence of different kind of seals, not only security, can invoke higher and significant trust to the service provider. This implies that such a platform which is driven by mediators/third trusted parties could provide benefits in the institutional trust perception.

5 Research

This chapter presents the research carried out in several European countries regarding trust building mechanisms and general trust issues. The impact of identified trust building mechanisms is examined and minimum necessary components for joining e-markets are identified.

5.1 Research methodology

To identify suitable trust building mechanisms and strategies regarding implementation into a SEAMLESS platform, a questionnaire survey was carried out. Type (buyer, seller), size and e-skills of companies and their present level of cross-border collaboration were selected as the factors for results segmentation. Other factors, which are important to examine, are the willingness to pay a fee for more complex services and to accept the publishing of negative ratings of an examined company so that all the ratings are visible for potential partners. According to these factors, we will analyze the business model regarding outsourcing and fees policy and level of benevolence regarding trust definition. In order to gather some additional information regarding trust on P2P e-market based on mediators, we also asked for their opinion on crucial factors of trust to the mediator on e-markets and as an examples, which mediator would be acceptable for them.

Generally, the results we wanted to examine and identify where:

1. How significant is the level of added trust according to a particular trust element or trust building mechanism ?
2. Which trust building mechanisms are necessary for joining an e-market?
3. Which types of mediators would be most acceptable?
4. What business model is most acceptable for SMEs regarding fees policy?
5. What differences are there between different sizes of companies and other relevant factors regarding trust perception and acceptance?

The purpose of the analysis was to:

- Identify the most suitable sets of trust mechanisms for a SEAMLESS platform,
- Identify a minimum set of trust mechanisms needed to implement in initial phase,
- Identify future shifts in trust perception, acceptance and requirements according to e-experiences,
- Identify the most frequented patterns regarding the trust model.

The research was carried out in 6 EU countries (5 NMS and 1 western EU country). The questionnaires were sent through email and were supported by phone interviews. In order to achieve a greater understanding of the questions, in every block of related questions, the description of related issues was added. The questionnaire is attached in Annex 1.

The population of respondents is given in the following table:

Table 1 Respondents segmentation

The factor	Population (Percentage from total)	The factor	Population (Percentage from total)
Number of questionnaires received	103	Number of valid questionnaires	92
Number of countries	6		
Number of micro companies (0-9)	15 (16.30%)	Number of companies with e-marketplaces experiences	6 (7.61%)

Number of small companies (10-49)	35 (38.04%)	Number of companies focused on selling	22 (23.91%)
Number of medium companies (50-249)	29 (31.52%)	Number of companies focused on buying	12 (13.04%)
Number of large companies (250+)	13 (14.13%)	Number of companies focused on selling and buying	58 (63.04%)
Number of companies with no experiences	9 (9.78%)	Number of companies focused on mainly international collaboration	27 (29.35%)
Number of companies with low experiences	54 (58.70%)	Number of companies focused on mainly domestic collaboration	41 (44.57%)
Number of companies with high experiences	22 (23.91%)	Number of companies focused on international and domestic collaboration	24 (26.09%)

5.2 Trust analysis within European SMEs

5.2.1 General information about the company

Information about the company which is necessary for trading between business partners within a SEAMLESS platform. The important question is the impact of a piece of information on trust for the company concerned.

Required "contact information", relevant for the platform's activities, which is necessary and the results show that this information significantly increases trust for 75% of all surveyed companies and 80.43% of all companies marked this information as necessary.

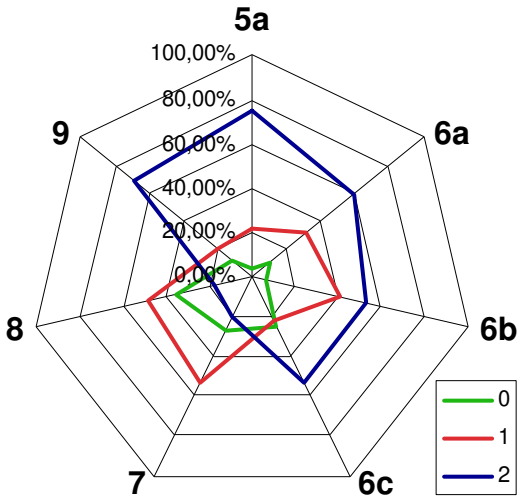


Fig. 4 Different level of trust in general information

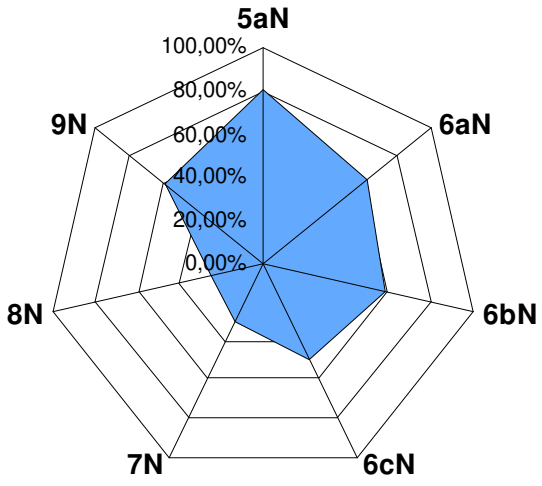


Fig. 5 Necessity of relevant elements of trust building mechanism

Comments:
5a Contact information; 6a Description of company's focus; 6b Product/service categories; 6c Detailed product/service description; 7 Company size; 8 Year of foundation; 9 Status of business activity
N means Necessary element for joining the e-market; 0 no increase of trust; 1 medium increase of trust; 2 significant increase of trust

The main attention should be focused on companies with electronic skills, because naturally other companies will achieve these skills after some time. 85.71% of e-skilled companies defined "contact information" as necessary and 78.57% of these companies defined that "contact information" will significantly increase trust in the platform.

"Description of company's focus" will significantly increase trust for 58.70% of all companies and for e-skilled companies at the level of 46.43%. On the other side nearly 62% (61.96%) of all companies considered this question as necessary and the percentage for this question among companies with e-skills is even higher (71.43%).

"Product/service categories" and "Detailed product/service description" are approximately at the same level and any differences are in the necessity of this information. 53.26% of all companies marked "product/service categories" as an issue that significantly increase trust (the same level as "Detailed product/service description") and this information will significantly increase trust for 57.14% of e-skilled companies (for both questions). There are differences in the necessity for this information. It is important for 58.70% ("Product/service categories") and for 48.91% ("Detailed product/service description") of all companies. For the company with electronic skills the numbers are a little higher and they consider "Product/service categories necessary" at the level of 67.86% and "Detailed product/service description" is necessary for 57.14% of companies.

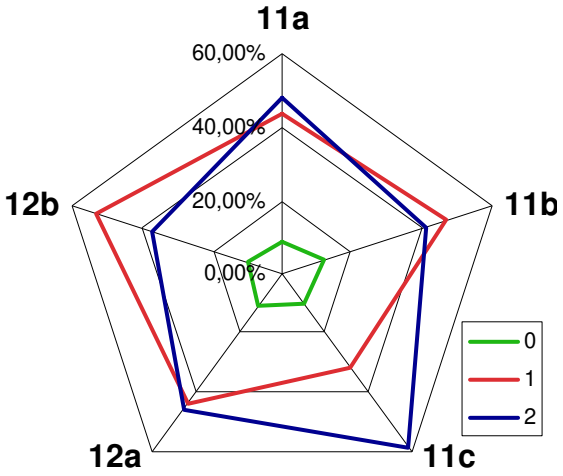
An interesting point to note is the information about "Size of company" and "Year of foundation". Information about "Size of company" will significantly increase trust for only 19.57% of all companies and for only 21.43% of companies with e-skills. 32.14% of e-skilled companies and 29.35% of all companies consider this question important. For information about "Year of foundation" the percentages are even lower. The 17.39% (all companies) and 17.86% (e-skilled companies) said that this information will significantly increase their trust and this information is necessary for 25% of all companies and for 28.57% of e-skilled companies.

Another situation is for "Status of business activity". Except "contact information" companies highlighted this question as important for increasing a platform's trustworthiness. This information will significantly increase trust for 68.48% of all companies and is necessary for 57.80% of them. Companies with e-skills consider that "Status of business" activity will significantly increase trust at the level of 67.86%, and it is necessary for 57.14% of these companies.

5.2.2 References and Certificates

Another trust building mechanism, included in the survey, were certificates and references. Certificates were divided into levels of "national certificates" and well known "international certificates". As we expected, the most important factor for companies was "international certificates". "International certificates" significantly increase trust for 58.78% of all companies and were necessary for 52.17% of these companies. "National certificates on local market" significantly increase trust for 47.83% of all companies with a 41.30% level of necessity. A special question was whether "foreign national certificates" increase trust. 41.30% of all companies consider them significant in increasing trust. "Foreign national certificates" were necessary for 35.87% of surveyed companies. Companies with electronic skills marked interesting results, where all types of certificates significantly increase trust at the level of 50% of surveyed companies. The only difference was the necessity of these certificates. The most necessary were "international certificates" (53.57%), then "foreign national certificates" (46.43%) and the lowest were "national certificates on the local market" with 42.86% of necessity.

References, in the survey, were introduced as "List of important business partners" and "List of conducted business". "List of important business partners" significantly increases trust for 45.65% of all companies and at the same level they are considered necessary for this trust building mechanism. E-skilled companies consider a higher level of significant trust increasing for this question (60.71%) and necessity of "List of important business partners" was at the level of 46.43%. "List of conducted business" was generally at the lower level for all companies as well as for e-skilled companies. Conducted business significantly increased trust for only 36.96% of all companies and for 46.43% of companies with electronic skills. Only 31.52% of all companies and 35.71% of e-skilled companies marked such a list as important.



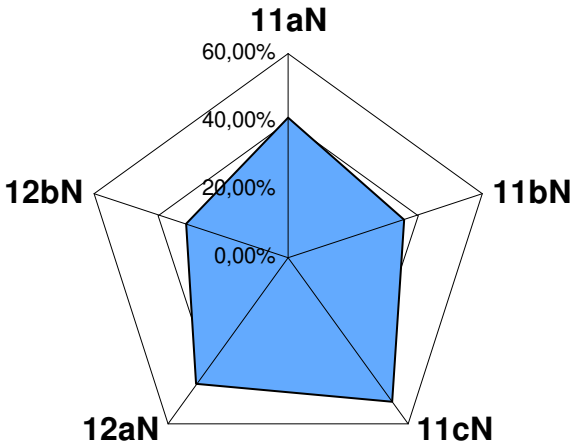


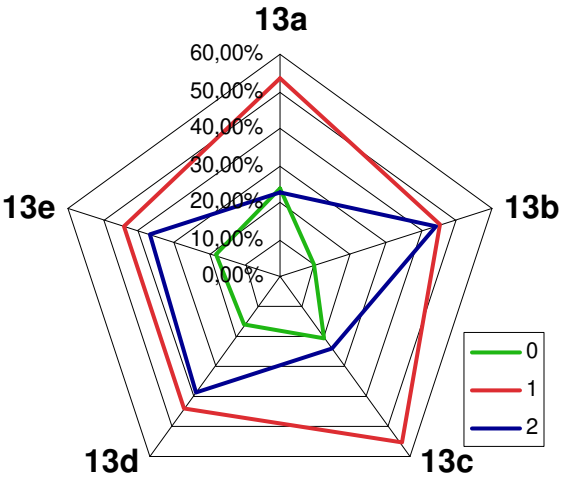
Fig. 6 *Different level of trust in certificates and references*

Fig. 7 *Necessity of relevant elements of trust building mechanism*

Comments:
11a National level certificates or marks of companies on the local market; 11b National level certificates or marks for foreign companies; 11c Known international established certificates; 12a List of important business partners; 12b List of conducted business

5.2.3 Reputation mechanisms

Reputation mechanisms could be used as trust building mechanisms. Companies were asked whether mechanisms like feedbacks, discussion forum, historical data and rating will increase trust in the platform. Feedbacks were divided into "Positive only" and "Positive together with negative" feedbacks.



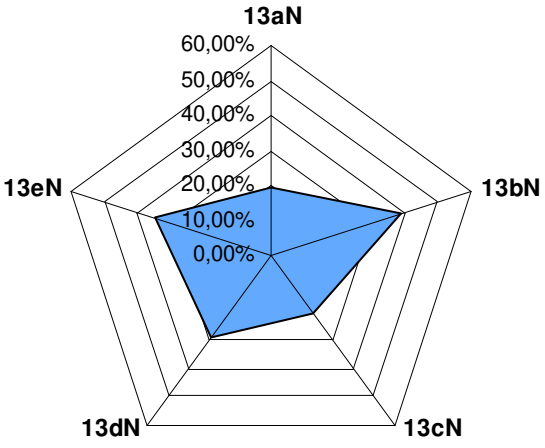


Fig. 8 *Different level of trust in reputation mechanisms*

Fig. 9 *Necessity of relevant elements of trust building mechanism*

Comments:
13a Positive-only feedback from the partners; 13b Positive and negative feedback from the partners; 13c Discussion forum; 13d Reports with aggregated historical data about the platform business activities of the company; 13e Rating presented as a simple symbol

The survey showed that all companies prefer "Positive and negative feedbacks" rather than "Positive only feedbacks". "Positive and negative feedbacks" significantly increase trust for 44.57% of all companies instead of "Positive only feedbacks" with only 22.83%. The need for "Positive and negative feedbacks" was at the level of 39.13% and at the level of 19.57% for "Positive only feedbacks". 50% of e-skilled companies consider that "positive and negative feedbacks" significantly increase trust and necessity for these feedbacks is at the level of 42.86%.

A "Discussion forum" significantly increases trust for 23.91% of all companies and for 35.71% of e-skilled companies. 20.65% of all companies and 28.57% of e-skilled companies consider a discussion forum as necessary. "Aggregated historical data" significantly increases trust for 39.13% of all companies, but 46.43% of e-skilled companies marked this data as significant for trust building. The data is necessary for 39.29% of e-skilled and for 29.35% of all companies. The last question for building the trust through reputation mechanisms was usefulness of "rating presented as a simple symbol". 53.57% of e-skilled and 36.96% of all companies consider that rating will significantly increase trust and also this mechanism was necessary for 50% of e-skilled companies and for 34.78% of all companies, making it the second most popular and trustworthy of presented mechanisms.

5.2.4 Contract negotiation platform

Contract execution is often difficult for companies and for this reason the contract negotiation platform is a relevant trust building mechanism. "Integration of negotiation outcomes into the contract" significantly increase trust for only 25% of all surveyed companies and is necessary for only 19.57% of all companies. Companies with electronic skills consider the same level of trust increasing and necessity (35.71%). "Negotiation process tracking and recording" significantly increases trust for 30.43% of all companies and it necessary for 20.65% of them. "Complex contract clauses offered by specialized company" is necessary for 28.26% and significantly increases trust for 30.43% of all companies. For e-skilled companies this mechanism significantly increases trust at the level of 39.29% and is necessary for 35.71% of e-skilled companies. What is Interesting is the information about "Basic contract clauses and templates" together with "Explaining of contract clauses and conditions".

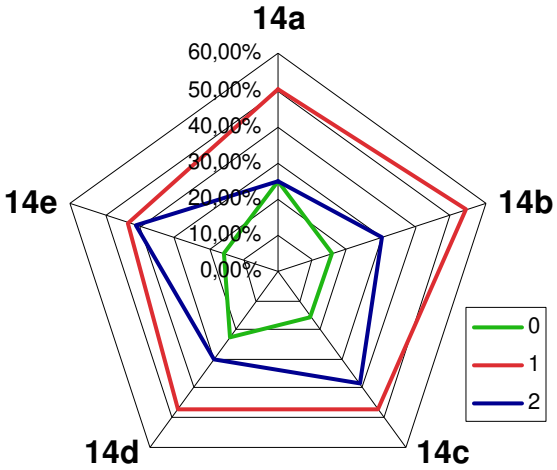


Fig.10 *Different level of trust in contract execution support*

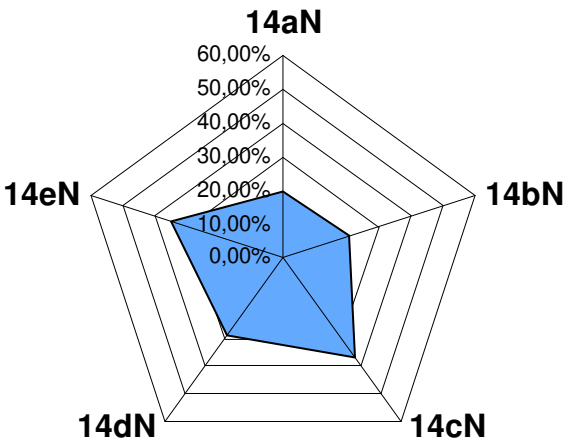


Fig. 11 *Necessity of relevant elements of trust building mechanism*

Comments:
14a The integration of business negotiation outcomes into the contract; 14b Contract negotiation process tracking and recording; 14c Basic contract clauses and templates; 14d Database/service with complex contract clauses for the fee provided by specialized company; 14e Explaining contract template clauses and conditions

For companies with electronic skills, both mechanisms significantly increase trust at nearly 54% (53.57%) and both mechanisms are necessary for 50% of surveyed e-skilled companies. 38.04% of all companies consider that "basic contract clauses and templates" significantly increases trust and the same mechanism is necessary for 36.96% of all companies. "Explaining of contract clauses and condition" significantly increases trust for 41.30% and is necessary for 34.78% of all companies.

5.2.5 Online dispute resolution (ODR) and Escrow services

This mechanism could help to solve problems resulting from business activities. The question was whether this mechanism is provided by the platform or if it would be better to provide this mechanism via an outsourced company. 51.09% of all companies noticed that "Advisory support – recommendation of ODR experts to participants" will significantly increase trust and is necessary for 47.83% of all companies. E-skilled companies consider that advisory support will significantly increase trust only at the level of 39.29% but advisory support was necessary for 42.86% of e-skilled companies. "Technical support" significantly increases trust for 61.96% of all companies and for 57.14% of e-skilled companies. It is necessary for 48.91% of all companies and for 53.57% of companies with electronic skills. "Limited ODR" – ODR with some level of complexity – significantly increases trust for 31.52% and it is necessary for only 16.30% of all surveyed companies. These levels were almost the same for e-skilled companies. Only the percentage of necessity was higher (21.43%). "Outsourced ODR service provided by specialized company" significantly increases trust for only 23.91% of all companies and it is necessary for 14.13% of them. 28.57% of e-skilled companies noticed that "Outsourced ODR" will significantly increase trust and only 17.86% marked that this mechanism is necessary.

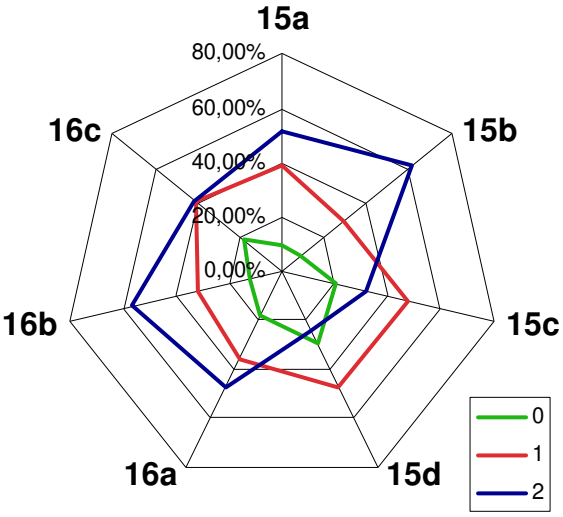


Fig.12 *Different level of trust in ODR and ES*

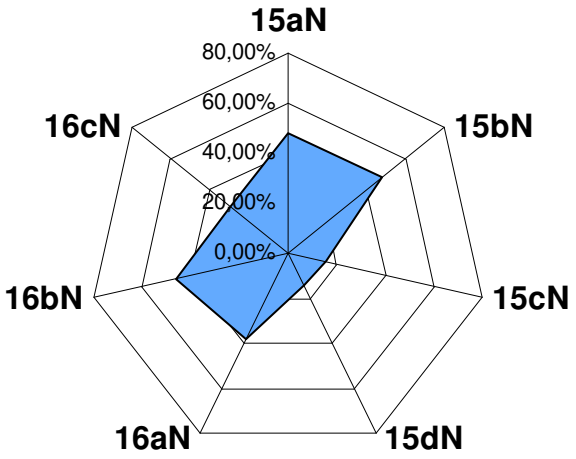


Fig. 13 *Necessity of relevant elements of trust building mechanism*

Comments:
15a Advisory support - recommendation of ODR experts to users; 15b Technical support; 15c Limited ODR; 15d Outsourced ODR service by specialized company; 16a Internal escrow service; 16b Bank will be the mediator; 16c Trusted Third Party

The "escrow services" is a mechanism that could be proposed by the platform as an "internal service", or by the "Bank as the mediator" or by a "Trusted third party". For all companies the "Bank as the mediator" significantly increases trust (56.52%), the second being "escrow services" as the "Internal service" at the level of 45.74%. "Trusted third party" significantly increases trust in only 41.30% (compared to other mechanisms) of all companies and this mechanism is necessary for 29.35% of all companies. The most necessary is "Bank as the mediator" for escrow services, 45.65% and escrow as "internal service" is necessary for 38.04%. Another is the situation among companies with electronic skills. "Bank as the mediator" significantly increases trust for 67.86% of them but the second most significant increase is

registered in "Trusted third party" (50%). Also, the necessity of "Bank as a mediator" is at the level of 50% and necessity of ""Trusted third party" at the level of 42.86%. 35.71% of companies with electronic skills consider that "Internal escrow service" will significantly increase trust and 28.57% of these companies feel the need for an internal escrow service.

5.2.6 Standardization

"Multilingual support with standard terms" would significantly increase trust for 64.13% of all companies and nearly for same number of e-skilled companies. Support is necessary for 54.34% of all companies and for 57.14% of companies with electronic skills. "Code of conduct" is necessary for 61.96% of all companies and necessary for 75% of e-skilled companies. "Code of conduct" significantly increases trust for 71.74% of all companies and 78.57% of e-skilled companies remarked that "Code of conduct" will significantly increase trust.

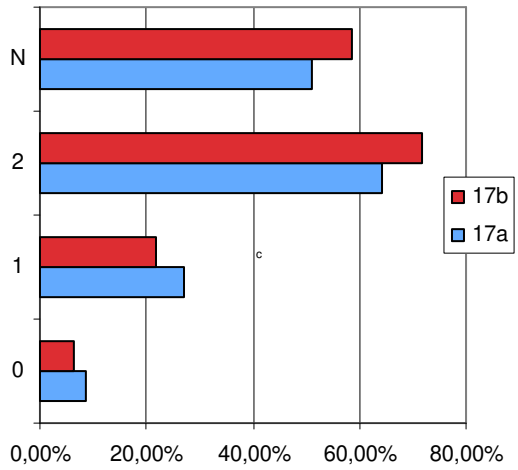


Fig.14 *Different level of trust in multilingual support and Code of Conduct*
Comments: 17a Multilingual support with standard terms; 17b Code of Conduct

5.2.7 Other issues and answers

65.22% of all surveyed companies consider that they will accept access to limited information and service free of charge.

73.91% answered that they will accept the possibility of being able to view all ratings/feedbacks but only if they also have to rate all transactions.

Also some companies said that mediators and universities could be experts for online dispute resolution. Mediators should also be trusted organizations for escrow services.

5.3 Implication from research

- Information about company size is not important and will not significantly increase trust.
- A combination of positive and negative feedback is more trusted and requested than positive only feedback.
- A discussion forum will not significantly increase trust, although it can serve as an explanation negative feedbacks.
- The integration of negotiated data into contract proposal will not increase trust, companies in that case prefer that the data in the contract proposal be correct.

- Simpler mechanisms in ODR are more trusted than complex ones. The level of increased trust is higher for e-skilled companies.
- Companies prefer the bank as an escrow service provider.
- Generally, companies prefer limited trusted services for low fee or free of charge. Acceptance of comprehensive specialized solution for the fee increases by increased e-skills.
- Most companies will accept the model, where access to negative feedback is needed in order to accept the publishing of their negative feedbacks.
- Companies do not tend to view as necessary the mechanisms with automation or where outsourced specialized company is proposed. Again, the critical factor for accepting is e-skills.
- Generally, the higher the e-skills of the company, the higher the trust in more sophisticated mechanisms.

6 Operational scenarios

This chapter uses the analysis from the previous chapter to propose and discuss several possible and acceptable strategies to solve trust building in the SEAMLESS network.

6.1 Considered strategies for trust building mechanisms

On the basis of the survey results and analysis, we will identify strategies for consideration upon implementation. In the following sub-chapters, the construction of every trust building mechanism will be described for the SEAMLESS platform and we will identify several considered strategies. Strategies will be described together with benefits and disadvantages in clear tables at the end of every sub-chapter. Proposed strategies are only examples of possible solutions, where specifications of implementation details can be discussed more in detail within ongoing reports.

6.1.1 Information quality

The quality of published information could highly improve credibility within all networks, as well as at the SEAMLESS platform. Companies, registered at the networks or marketplaces are asked for information and some level of validation could increase trust of these marketplaces. Credibility is also the dominant reason for validation of some kind of information. It is necessary to validate information at the well-balanced level, because validation could also increase costs for mediators on the SEAMLESS platform.

In all marketplaces, but especially in the SEAMLESS platform, we have identified the data set pertaining to the company, which includes:

Company Name, Address (Street number, City, Country), Legal form - which can be very easy validated by the mediator. In order to validate this data, the mediator can use national business registries. From these registries, the mediator could also validate the year of the company's foundation. Although, according to an analysis of this information it is only highly significant for increasing trust in 18% of e-skilled companies and only 11% of companies without electronic skills, this validation is easy as it is also mentioned in national registries. That's the reason we recommend the validation of this information.

More important information for companies, as well as for the SEAMLESS platform, is the information about the Contact person or persons (First name, Surname, Position, Tel./Cell. number, Email). This information could be validated through contacting the company, to ensure the contact person is really the responsible person. The mediator can also easily check the correct Web site of the registered company.

The validation of *information about company size* could be difficult, as it is dynamic information and it would require annual checking in the national statistic censuses. As the information about company size (number of employees) is highly significant for only 21% e-skilled companies and 22% of companies without electronic skills, and because of difficulties with validation, we don't recommend that this information is validated by the mediator.

Information about *financial data* (turnover, profit) is difficult for the mediator to validate and this action also requires periodical checking. Characteristics of this type does not, in itself increase trust in the platform, especially among small and medium sized companies and can be confusing. This kind of information was requested in only 5 responses and it could be part of a company profile, but we recommend that it not be validated, as it constitutes too great an effort by the mediator.

Other information is a description of the *company's focus*. As the main information about a company's focus can be described by free text (e.g. upload a document with this information), it is not possible to ensure automatic translation to national languages via ontology. It could be provided by uploading documents or links to this information on the company web site.

Information "*Product/service categories*", which is in the style of a catalogue, will be supported via ontology for the selection of product families. In SEAMLESS, the ontology is used to achieve automated translation of categories (product families) and attributes of products and for standardization of the terms used in focused sectors in some business processes (for more detailed information about ontology implementation, see relevant deliverable).

Detailed product/service description is necessary for 52% companies with low electronic skills and for 57% of e-skilled companies. This information would significantly increase trust for 54% of companies with low electronic skills and for 57% of e-skilled companies. As the description is presented by free text, the platform cannot support effective translation of detailed product description. For increasing trust, companies could provide a detailed description in the form of uploaded files (technical documentation) or through links to their web pages with relevant information and the possibility of "request for sample".

Status of business activity was identified as a very important issue for trust in the SEAMLESS platform. Information about a company's status (if the company is valid, or if it is in bankruptcy or a winding up process) would significantly increase trust for 68% e-skilled companies and 74% for companies with low skills. For validation of such information, the mediator can use national registries of companies in bankruptcy process - if such a registry exists in the country. In that case, when it is possible in all potential countries, we foresee the possibility for the integration of such a service from national registries into the SEAMLESS platform (automated periodical update of outputs from registries). The implementation is also determined by the cost of such a service in particular country.

Strategies for increasing trust by validation of the company background information

Strategy	Description
S 1.1	Some of the information can change frequently over time (i.e. contact persons, company's size etc.). However, periodical validation will constitute too great an effort for the mediators and it is not recommended for S 1.1. All subsequent information will be validated during the registration phase only. *Contact information* (i.e. company name, address, web page, contact persons, etc.) The simplest way to validate provided contact information is for the mediators to contact the company directly. Some information, i.e. e-mail addresses can be validated explicitly in the registration phase; for example when the authentication code is send to the company. Base contact information can be validated also via the national registries. Note that in this case, the registry itself should be considered as a trusted third party. If the registry provides electronic services, the validation process can be automated and integrated into the platform. *Base general information* (i.e. legal form, year of foundation, company's size, etc.). This information can be validated in a similar way as the contact information. *Financial data* (i.e. turnover, profit). Because of the character of this information and the complexity of validation, we recommend that it be part of the company profile, but without validation by mediator. *Company's focus* The main information about a company's focus can be described by free text. It is not possible to ensure automatic translation of this description into national languages via ontology. It could be provided by uploading electronic documents (if the uploads of the documents are supported) or through the link to the company web site. Not validated by the mediator. *Provided/requested categories of services/products*. In SEAMLESS, the ontology is used for achieving automated translation of categories (product families) and attributes of products and for standardization of terms used in focused sectors in some business processes (for more detailed information about ontology implementation, see relevant deliverable). Note that via the categories, a company can describe the products/services only on the general level and cannot provide details about the specific item. *Detailed products/services description*. In order to increase trust, companies could provide a detailed description in the form of uploaded files (technical documentation) or through the links to their web pages with relevant information and the option to "*request samples*". Note that uploaded content cannot be translated via ontology. **Benefits**: Minimum effort for mediator to validate information. **Risks/disadvantages**: Upload of various electronic documents which describe company's focus

	or detailed description of products/services should be supported **Impact on:** T1.3: validation with mediators, T4.1
S 1.2	*Status of business activity* (i.e. company is valid, in bankruptcy, or in winding up process). The status of business activity was identified as a very important issue for trust in the SEAMLESS platform, but it can be difficult for mediators to validate this information. The character of this information requires real time (or frequent) validation. The suggested strategy is to utilize an existing national registry of the companies in bankruptcy process, if available. If the registry provides electronic services it is recommended that these be integrated into the services to allow periodical validation with the lowest effort on behalf of the mediators. The implementation is also determined by the cost of such a service in a particular country. **Depends on**: S 1.1 **Benefits**: Maximum validation of information with daily updates of Status of business activity. **Risks/disadvantages**: Difficult implementation. Requires the integration of the registry of companies in bankruptcy process (possibly via electronic services). **Impact on**: T1.3: Identification of provided service in EU countries, T4.4?: Integration of mentioned service, T4.1

6.1.2 Certificates

For the purposes of quality presentation, different kinds of certificates are provided by companies. These information attributes are awarded to companies by trusted third party and can induce trust in the company. For the SEAMLESS platform we have identified two dimensions of certificates: international and domestic. However, domestic certificates need to be examined from two viewpoints: how the domestic certificate is trusted by the domestic partner and by the foreign partner.

According to our survey, the most significant and necessary certificates are those of an international character (e.g. ISO certificates), although we didn't identify significant differences. However, more than 50% of all companies, regardless of type and size, said that international certificates are necessary. International certificates are well established and known.

The position on national certificates or quality marks is different. Business partners in the same country know their national certificates, but the situation more difficult when business partners are from different countries. They don't know national certificates from other countries, but our survey shows that this kind of information will significantly increase trust (especially companies with e-skills).

For the SEAMLESS platform, it would be useful to have types of certificates conceptualised in the ontology, meaning their translation into local languages. Together, companies can add information about certificates to the SEAMLESS platform with a web-link to the certification authority or with contact information for evidence of such a certificate. In that case, if this information is crucial to business partners, they have the option of contacting the certification authority for verification of this information. Conceptualization will provide the option of search according to types of certificates.

Strategies for increasing trust by implementing certification in the company profile

Considered strategies	Description of strategy
Strategy 2.1	All kind of certificates will be shown with links to the relevant institution or some contact information for evidence of certificate award. For validation/checking, the company which is examining a potential business partner can be provided with information about his certificates. Example: A company needs to fill in: Name of certificate:

	Type of certificate: National certificate for the best product quality. Country: Slovak republic. Contact information: Agency for Slovak Gold Quality. Address, web link and phone. **Benefits**: Easy implementation without validation effort by mediator. **Risks/disadvantages**: No possibilities for searching according to certificates.
Strategy 2.2	In this strategy, categories of certificate types will be developed and implemented as a part of the ontology. In the registration phase, a company can select a type of certificate from a pull down menu. Other information will be filled in as mentioned above. The mediator will validate whether the national certificates is in the right category. In this case, type of certificate can be used as additional criterion for searching. **Benefits:** Searching capabilities according to type of obtained certificates. Pull down menu support by registration in "Profile company" **Risks/disadvantages:** Mediator needs to verify the categories of certificate type. Additional effort to the ontology. **Impact on:** WP2 esp. Ontology: Certificates categories development, T4.1, possibly T2.3 and T2.4 for categories identification

6.1.3 References

References are another part of possible trust building mechanisms on a SEAMLESS platform, which can be divided into two parts: "Business partners" and "Conducted businesses".

Regarding references on significant partners, the company without a trading history at the SEAMLESS platform, can add in the registration phase "external business partners" (this means traditional business partners apart from SEAMLESS platform). This information won't be validated by the mediator, because companies can contact these business partners according to their requirements. Internal business partners are business partners registered on the SEAMLESS platform. A company can include these business partners into a reference list within the registration phase or after the trading process. In both phases, the business partner should have the option of approving the publishing of such information (for example, if a buyer wants to publish his supplier as his significant business partner, this supplier will have the option of refusing or approving it). It means that if a partner doesn't want to show this information, the company will have this information in the profile as a list of business partners (for simple sending next RFx and avoid searching), but the information won't be visible to others. A reference will be visible to others after approval. To improve the quality of this information, it would also be useful to implement information about weight, in the simple form of "number of transactions with partner".

As transparency is a very sensitive trust issue, companies should have the option of hiding key business partners (e.g. a company wants to hide its supply chain).

In the registration phase, companies should have the option of checking "Default approval" of publishing your name into the list of business partners and it means that every business partner has the possibility to add the company to the reference list without waiting for approval. In that case, an intelligent agent will have to check the existence of this relationship, which is additional effort on implementation.

In the list of references, every business partner will have a rating by the name and the option of clicking on his profile.

References on "conducted businesses" provide the possibility for companies to present their significant work (known buildings, textile collection, etc.). For validation purposes, some contact/evidence information should be provided. Then, mediators will be not responsible for the validation.

Consider: "Possibility of automated update of reference by particular company after contract execution".

Strategies for increasing trust by implementing references

Considered strategies	Description of strategy
Strategy 3.1	A SEAMLESS participant will have the option of generating a list of references on business partners and conducted businesses. No possibility to refuse or approve publishing of reference will be provided. Internal checking of relationship existence will be done by the SEAMLESS platform. For each reference on conducted businesses, the contact information for validation can be submitted. It will be possible to find companies which have a particular company in the list of references. Notification of adding the company name in the list of reference will be sent to the relevant company. **Benefits**: Transparency about relationships on SEAMLESS platform (but it has also some risks, see below). **Risks/disadvantages**: Without the chance to refuse publishing reference, some companies will have no possibility to hide supply chain as all references will be transparent. **Impact on**: WP4: Implementation of internal checking of relationship existence
Strategy 3.2	SEAMLESS participant will have the possibility of generating a list of references on business partner. When submitting the company name into the list, the relevant company will have to approve the publishing of their name. Such approval will also have support in "Profile Company" to have the possibility to have preference "Default approval", with possibility – "I accept all published reference with no need for my approval" or "I want to approve every published reference on my company". Reference on conducted businesses will be enhanced by contact information for validation. **Benefits**: Existence of the option of hiding the supply chain. Higher acceptance of the service. **Risks/disadvantages**: Only partial list of references will be visible. Additional implementation effort. **Impact on**: WP4: implementation of approval and preference settings.

6.1.4 Reputation mechanisms

Reputation mechanisms are trust building mechanisms providing evaluation of past business activities betweens partners on the platform. Reputation building mechanism can consists of feedbacks, discussion forum, rating and historical data aggregation and can provide a self-regulation function of trust on SEAMLESS platform. According to source credibility theory, it will be suitable to calculate aggregated ratings and feedbacks by weighted average where the weight is determined by the rating of raters (companies providing feedback).

Feedbacks from business partners could be split into positive only feedbacks and combination of positive with negative feedbacks. Positive only feedbacks could deform information ability and according to several surveys, companies usually tend to look for negative feedbacks. In our survey, only 19% of all companies said that positive feedback is necessary. 45% of all companies said that this model would significantly increase trust and more than 40% of them marked this model as necessary for joining the platform, a combination of positive and negative feedbacks must be implemented. Feedbacks should be provided on several business areas, as for example payment, service, product quality, … An example is shown in Fig. 2.

A discussion forum can be established in the company section, which means that if a business partner is unsatisfied, he can add comments about a company on the discussion forum. These comments have to be non-anonymous and public, the concerned company could react to these comments and describe the situation from its point of view. Comments cannot be translated so it is necessary to use common language. Although only 21% of companies would require this service as a pre-requisite for joining the platform and for only 24% would this information significantly increase trust, the implementation is ease, therefore it would be useful to implement.

Historical aggregated data as statistical support can increase trust in business partners, as well as the platform, where companies could see useful aggregated data about their partner as well as the number of tenders in which the company was involved, the average time of reaction, in how many tenders was the company selected as winner, the total number of transactions, the frequency of platform presence, number of ODR or Escrow service activities, etc. This information can be implemented into the section "Company profile". Although only 29% of companies replied that this information is necessary, 39% said that it would significantly increase trust. Therefore, it would be positive to implement such information.

Rating is presented as a simple mark or number and is calculated on the basis of feedbacks and weights of raters. Although only 35% of companies request rating as necessity, 50% of e-skilled companies responded, qualifying rating as a necessary tool and 54% of the same type of companies found that rating is very important. For that reason, rating would be beneficial to the trust issue for the SEAMLESS platform. A general rating mark could be made public to all participants on the platform. An important issue is also to indicate and publish the number of business partners which rated this company (e.g. number of unique companies / number of rated businesses). This helps indicate unfair practises like multiple rating from related partner. Rating can be always visible for all references on the platform sites.

Generally, the survey showed that trust in the reputation mechanism is increasing by increased e-skill and is very important to provide at least feedbacks and ratings in an easily understandable way.

Strategies for reputation mechanisms

Strategy	Description
S 4.1	*Feedbacks.* Feedbacks should be provided on several business areas (payment, service, product quality, hire again…). The best or minimum areas would need to be examined in WP1.3. An example is shown in Fig. 2. The companies will have the option of evaluating business partners after a transaction. We propose to use the scale from 0-1, weighting by rating of rater and also present the number of total ratings. *Rating*. Feedbacks from the partners are aggregated to the numerical rating usually presented with graphical marks. Useful information to the rating is the indication and publishing of the number of business partners which rated the relevant company (e.g. the number of unique companies / number of rated businesses). It helps to indicate unfair practices like multiple rating from related partner. Rating can always be visible for all references on the platform sites (in company profile, in results of searching, list of references, etc.). *According to source credibility theory, we suggest calculating aggregated ratings and feedbacks by weighted average where the weight is determined by rating of raters (companies providing feedback)!* *Discussion forum* can be established at the company section. If a business partner is unsatisfied, he can add comments on the discussion forum. These comments have to be non-anonymous and public, the concerned company could react to these comments and describe the situation from its point of view. Comments in free text cannot be translated so it is necessary to use common language.

	Benefits: Easy implementation. Easy to understand. Self-regulation of trust. **Risks/disadvantages**: Absence of additional information about historical business activity of partner. Impact on: T1.3: Feedback presentation method, WP3, WP4: implementation
S 4.2	Besides the aggregated ratings based on the feedbacks from other partners, the system will collect and aggregate historical data about the various activities on the platform. *Historical aggregated data* as statistical support can increase trust in business partners, as well as the platform, where companies could see useful aggregated data about their partner like the number of tenders in which company was involved, average time of the response (i.e. to the RFI, RFX documents), in how many tenders was the company selected as a winner, total number of transactions, number of the ODR or Escrow service activities, etc. **Depends on**: S 4.1 **Benefits**: Ease to understand. Self-regulation of trust. Comprehensive information for reputation with aggregated historical data about the business activities. **Risks/disadvantages**: This strategy requires an additional implementation effort for developing mechanism, which will extract and aggregate data from logs about the various business activities on the platform. Impact on: T3.3

6.1.5 Contract execution support

Contract execution support as identified from 4.2.7 can be supported in the SEAMLESS platform in several ways. By providing one or more of following services "Integration data from negotiation into contract proposal form", "Basic contract clauses", "Outsourced comprehensive database provided by specialized company" and "Explaining contract clauses and conditions".

"Integration data from negotiation into contract proposal form" has to provide the correct use of negotiated data in orders and invoices to avoid mistakes or changes in official business documents.

"Basic contract clauses and templates" is a database of most frequently used contract clauses. This information should be integrated into the SEAMLESS platform in two ways: integration into the contract proposal with particular level of automation (sentences with fields automatically filled from negotiation documents or company profile) or a simple database of templates. It should also support creation and storage of its own template, which can be used next time by another similar transaction.

"Outsourced comprehensive database provided by specialized company" provides databases from a specialized outsourced company which can include several thousands clauses and templates. In this case, it could be difficult to implement automation of the updating clauses by negotiated data if the company is not able to provide it.

"Explaining contract clauses and conditions" should be implemented in the case of providing basic clauses. It supports higher awareness and understanding of used clauses in a contract and helps to avoid some misunderstandings.

As basic contract clauses, together with a contract clause explanation are most necessary among our respondents (35-37% of all and 50% of e-skilled companies) and very important for trust (38-40% of all 53.57% of e-skilled company) it would be useful to implement such a service into the SEAMLESS platform. Although the other three services were only requested by approx. 20%, recording the issue is very important for the ODR even if it will not be implemented into the ODR on the SEAMLESS platform.

For effective and mistake free contract preparation, the integration of negotiation outcomes into the contract proposal has to be implemented. In this case, the templates have to have rules for dataflow which will allow the automatic copying of data from the negotiation document into contract fields.

Regarding tracking and recording functionality, the survey showed a low necessity and lower level of trust. Together, tracking functionality requires complex automation and integration of business processes with higher implementation effort. For that reason, we recommend implementing only the recording function. This enhancement can be provided later after the SEAMLESS platform execution. Recording of the exchange of business documents in a contract and negotiation phase can support very effectively ODR processes if necessary and can provide the possibility of saving frequent contract templates.

Strategies for contract execution

Strategy	Description
S 5.1	*Basic clauses and contract templates* Partners will exchange the "Contract proposal" business document which will consist of the clauses that specify various conditions for the ongoing business transaction. Initiator of the negotiation will be usually the buyer who will send the first proposal. The seller will approve current version or suggest changes (i.e. remove/add some clauses or change the value of some data fields). Contract clauses will be stored in the ontology as the localizable terms which consist of the clause text and description explaining the clause scope and application. Text of the clauses can be parameterized with the dynamic data fields (i.e. contact information, delivery time, discounts etc.). Additionally, it should be possible to start the negotiation with the contract proposal based on the standardized contract templates. It should be possible to save a new template. *Negotiation tracking* All changes in the "Contract proposal" business document and other communication on the platform between partners are tracked to document negotiation process. (so the history of the negotiation process can be inspected for the ODR). **Benefits**: Simple implementation. **Risks/disadvantages**: Basic clauses do not support automatic dataflow and data always has to be entered or integrated into the subsequent documents manually. **Impact on**: T1.3 Proposed sub-task: Contract clauses and templates identification, T3.3, T4.2, T4.3
S 5.2	*Dataflow integration.* The definition of the clauses in the ontology is extended with the dataflow rules which will allow the automatic filling in of the clause fields from the business documents or company profile. Note that to ensure maintenance of the system, the rules cannot be "hardcoded" in the business processes and they should be specified as the integral part of the ontology in a declarative way. **Depends on**: S5.1 **Benefits**: Data in the contract clauses is filled automatically from the previous business documents or company profile. Outputs of the negotiation can be automatically integrated into the subsequent business processes. **Risks/disadvantages**: The dataflow mechanism has to be implemented. **Impact on:** T3.3, T4.2, T4.3
S 5.3	*Outsourced specialized database of contract clauses and templates*

	Database of contract clauses and templates provided by the specialized outsourced company will be integrated. (The specialized database can be provided for the additional fee). **Depends on**: S5.2 **Benefits**: Specialized catalogue of contract clauses and templates. **Risks/disadvantages**: Additional fee for the SEAMLESS participants in the case of utilizing outsourced database. The outsourced catalogue has to be integrated into the ontology (this includes the integration of the dataflow rules). **Impact on:** T3.1: Identification of provider,T2.1, T4.4

6.1.6 Online dispute resolution

Online dispute resolution is generally recommended for the best future practice of e-marketplaces. For the SEAMLESS platform we have identified following possibilities/functionalities:

ODR advisory support is a minimal service to support dispute resolution. Providing a simple list of experts can save time and leave self-selection to the company. It is necessary to provide advice on how to start an ODR process or what are the key success factors in the process.

Technical support is a standard support provided on electronic platforms, which has to solve technical problems and minimize inconveniences when conducting business transactions. Fast and efficient response on identified problems can increase trust in the platform and improve customer's loyalty.

Limited ODR is a model, when only the minimum of the ODR services are provided. When more complex problems emerge, external partners are usually offered. Limited solutions are usually free of additional charge or for a very small fee. In many cases, it can bring efficient and fast problem solving . One of the main basic limited services is mediation, which should be supported by an efficient source of evidence. In the case of unsuccessful mediation, partners will choose whether to use a specialized external ODR provider or a traditional court.

Outsourced specialized ODR service, as a strategic alliance can be carried out in two ways: 1) The agreed ODR partner can be integrated and has the option of checking all evidence from the platform with communication directly with the platform. 2) The ODR provider will offer services outside the platform although with evidence support.

The willingness to participate in ODR should be clearly stated in "Company Profile" and in each contract.

NOTICE!!! As ODR processes can be very complex, the most efficient way for the initial phase is only to provide list of ODR experts, see strategy 6.1. Implementation of other ODR strategies requires negotiations with selected mediators or ODR providers, analysing the best business and trust model according to real experiences, fees and references. These activities can take longer and can be done after the initial phase of SEAMLESS.

Strategies for increasing trust by implementing ODR

Considered strategies	Description of strategy
Strategy 6.1	For the technical issues, the SEAMLESS platform should provide standard services for the resolving of technical problems. It is recommended that these services be supported by some issue tracking system accessible on-line for the registered partners. For business related issues, the SEAMLESS platform will provide the guidelines on how to proceed when the partners find some problems related

	to the contracts. The part of this guideline will be the list of the external ODR providers. maintained by the mediator. The list should contain at least the contact information but it can be extended for example with the references to the ODR experts from the other partners. If some dispute emerges, partners will agree on the ODR expert and contact him outside of the platform. **Benefits**: Easy implementation. **Risks/disadvantages**: Mediator has to provide the list of the ODR experts. **Impact on**: T1.3: List of ODR expert development, T3.3
Strategy 6.2	S 6.1 will be extended in the following way: *Limited ODR* Limited ODR would be the internal service of the SEAMLESS platform. At first, the mediator will nominate the internal expert who will moderate the discussion between the partners. This moderator will have a possibility to ask for access to all business documents recorded during the unsuccessful business transaction (see 5.1). ODR service will be technically supported by the internal issue tracking system which will provide the discussion forum moderated by the ODR moderator. In the case of unsuccessful mediation, partners will choose if they will use a specialized external ODR provider (selected for example from the guideline list of the experts) or traditional court. SEAMLESS will provide all necessary evidence to the ODR provider or court. **Benefits**: Providing mediation with evidences from SEAMLESS platform. Easy and fast process. Expert will have information about the partner's behavior. **Risks/disadvantages**: Requires that the mediator nominate the expert who will moderate the discussion between the partners. Requires internal issue tracking system. Requires the history of the business documents exchanged during the business transaction. **Impact on**: T1.3: List of ODR expert development + ODR provider identification and agreement, T3.3, T4.3
Strategy 6.3	Strategic alliance with selected external specialized ODR provider for an additional fee is provided. In this case after dispute identification, business partners have the possibility to start an ODR process. The ODR provider will have an account on the SEAMLESS platform which will be used for communication between relevant companies and ODR provider. The ODR provider will have access to the recorded documentation and communication between relevant partners. This access will be audited in case there is illegal checking of information not relevant to the case. For the ODR process, standard communication is used as emails and discussion forum for moderated mediation. **Benefits**: Providing specialized and complex ODR service. Not necessary to integrate ODR provider into the SEAMLESS platform. **Risks/disadvantages**: Necessity of recording platform communication. No possibility to choose another ODR provider. Additional fee for the participant. **Impact on**: T1.3: List of ODR expert development + ODR provider identification and agreement
Strategy 6.4	S6.3 with integrated solution of specialized ODR provider for the additional fee. In this case, again a strategic alliance with ODR provider is realized.

	ODR provider which has its own ODR software solution will integrate this solution into the SEAMLESS infrastructure and offer services according to agreed conditions. **Benefits**: Providing specialized and complex ODR service. All communication will be conducted on the SEAMLESS platform. **Risks/disadvantages**: Necessity of recording platform communication. No possibility to choose another ODR provider. Additional fee for the participant. Additional implementation effort regarding ODR provider integration. **Impact on**: T1.3: List of ODR expert development + ODR provider identification and agreement, T4.4

6.1.7 Escrow service

For the SEAMLESS platform in the field of escrow service, we have identified the following possibilities of implementation:

An Internal Escrow Service, which is provided internally on the electronic platform. The internal provider will receive money from the buyer in the bank account in a selected bank. After delivering the product according to the agreed conditions (check in the shipping company), money will be transferred to the bank account of the seller. To keep the service simple, checking condition for internal ES should be focused only on the condition of payment and delivery. Breach of other contract conditions will be solved by the ODR service. This service can be implemented directly into the SEAMLESS platform where all communication would be conducted on this platform (sending approval about conditions).

The bank as a financial institution, which is the most accepted model in our survey. The bank offers products for their clients like documentary credits to ensure payment against agreed documents. The service guarantees the payment against terms/times of delivery. Banks don't guarantee quality of products or quantities. In this case, breach of other conditions is resolved by the ODR service. The best model for the SEAMLESS would be a strategic alliance with one bank, where all SEAMLESS participants will have accounts. In that case, ES services are very efficient, avoiding fees for bank transfers in international trade. According to some surveys (e.g. results from 6FP IST Fluid Win project) banks have an interest in integrating services with the business community. In this case it would be an ideal solution. The sense for increasing trust in the SEAMLESS platform has only strategic alliance with providing the possibility for all participants to have a bank account in this bank. In this case, it would be useful to provide information in the company profile, that participant uses "SEAMLESS ES account".

Specialized external ES company, with experience in this field, can offer a very professional ES service with integration of ES solution into the electronic marketplace platform. Specialized companies can also provide control of some additional contract conditions such as quantities, quality etc. Although such a service may be more expensive.

The differences between mentioned models can be in fees and the range of provided services, and efficiency is dependant upon the selection of an appropriate ES provider. In all cases, the most efficient solution for the SEAMLESS would be the possibility for all SEAMLESS ES participants to have an account in the same bank to avoid additional fees for financial transfer between international banks. Although it is also possible to provide a list of specialized ES providers, according to our survey it is not efficient as the most requested is an internal service or bank.

In the "Company profile", it would be useful to implement information about the willingness to participate in ES and number/percentage of successfully conducted ES transactions.

NOTICE!!! Efficient Escrow services are complex services, where integration or at least agreement with shipping companies is needed, especially for tracking relevant information in real time. ES can be integrated with ODR to enhance trust in the after-contractual phase. For that reason, we *recommend considering the following strategies for the near future* and not for the initial phase. Integration and agreements with shipping companies could also have significant impact on the enhancement of provided services. On the other hand we need to take into account the requirements of our survey where 45%

required the bank as ESP as a necessity. This aspect can be solved in the next few months of the project duration and after more detailed analyses of business and organizational model of this service in order to propose the best solution. Implementation of this service can bring a competitive advantage to the SEAMLESS platform.

Strategies for Escrow services

Strategy	Description
S 7.1	*Internal Escrow Service*, which is provided by SEAMLESS partner/mediator. The mediator will receive money from the buyer in the bank account of the selected bank. After delivering the product according to the agreed conditions (checked in the shipping company), money will be transferred to the bank account of the seller. The checking of the contract conditions by mediators should be focused only on payment and delivery. Other issues related to the contract conditions can be resolved in the combination with the external ODR service. Internal ES can be integrated into the SEAMLESS platform and all communication should be conducted on the platform internally (i.e. sending of approvals about conditions, etc.). To avoid transfer costs it is suitable for the SEAMLESS participants to have accounts in the same bank. Conditions regarding the duty to pay for transfer cost should be implemented into the contract. **Benefits**: Possibility to offer cheaper or free of charge service and increase trust. **Risks/disadvantages**: Additional effort by the selected mediator. Higher costs for companies when the selected bank will not allow to open account for the company It is more efficient to provide the list of approved shipping companies. **Impact on**: T1.3 Proposed sub-task: ESP identification and agreement, T3.3
S 7.2	Escrow Service provided by the bank. The bank offers products for their clients like documentary credits to ensure payment against agreed documents. The service guarantees the payment against terms/times of delivery. Banks don't guarantee quality of products or quantities. In this case, breach of other conditions is resolved by the ODR service. The best model for the SEAMLESS would be a strategic alliance with one bank, where all SEAMLESS participants will have accounts. In that case, ES services are very efficient, avoiding fees for bank transfers in international trade. According to some surveys (e.g. results from 6FP IST Fluid Win project) banks have an interest in integrating services with the business community. In this case it would be an ideal solution. The sense for increasing trust in the SEAMLESS platform has only strategic alliance with providing the possibility for all participants to have a bank account in this bank. In this case, it would be useful to provide information in the company profile, that participant uses "SEAMLESS ES account". According to the results of the survey, the bank is the most accepted escrow service provider. The SEAMLESS consortium should find the bank for strategic alliance, which can offer this service. Banks are already providing this service on the basis of documentary credit. Agreement with the bank should discuss open issues such as the evidence issues (to avoid presenting original documents to the bank, e.g. shipment documents or invoice), integration level, acceptance of all SEAMLESS participants, etc. in the case of the bank being in the strategic alliance and integration is agreed. After contract execution, the buyer will send the money according to the conditions to the bank (if the buyer has an account in allied bank, the bank will freeze the money if approval does not arrive. The supplier will send the product by shipment company and submit shipment documents to the bank (the best solution would be to send electronic documents approved by shipment company). The bank will check the conditions and after approval will transfer the money to the seller. **Benefits**: Most acceptable model according to our survey. Highest level of trust. **Risks/disadvantages**: Necessity of selecting one bank as strategic alliance and agree terms. Fees policy of the bank. In the case of non existence of legal electronic documents, problem

	with document submitting if partners are from different countries. **Impact on**: T1.3: ESP identification and agreement, T3.3, possibly T4.4
S 7.3	*Specialized outsourced ES provider*. Both partners agree to use escrow service and agree terms of the transaction, which includes a description of the merchandise, sale price, number of days for the Buyer's inspection, and any shipping information. The buyer submits available payment option. ESP verifies the payment. Upon payment verification, the Seller is authorized to ship the merchandise and submit tracking/shipping information. Shipping is realized by agreed shipping companies. ESP verifies if the buyer received the item. The buyer usually has time to check the quality of the product. After approval, ESP will transfer the money directly into the bank account of the seller or by another agreed payment method. In the case that the transaction is not approved, ESPs can have ODR services. **Benefits**: Professional ES with wide range of provided services and agreed shipping companies. Some ESP offer integrated ODR service. **Risks/disadvantages**: Additional effort by integration ES solution of specialized company. Little bit higher acceptance of bank's ES as specialized company according to our survey. **Impact on**: T1.3: ESP identification and agreement, T3.3, T4.4

6.1.8 Standardization

As standardization is one of the most important requirements by professionals in the field of e-marketplace processes, we have examined which possibility will help the issue of standardization in addition to the already mentioned mechanisms (for example contract platform and especially clauses also supporting standardization, etc.).Service agreement and ontology/multilingual issues were identified as the main issues for the SEAMLESS project..

Service agreement will address three types of agreements which can be integrated. It consists of:

"Code of conduct" A very important document regarding requested and ineligible practices on the platform and guidelines as to what to do in such cases. Implementation of a code of conduct is the question of business model and agreement between SEAMLESS partners regarding required information mentioned in Annex 2.

Terms and Condition Agreement is a standard document on e-marketplaces, where accepting terms and conditions is required in the registration phase.

Service level agreement has to address relations between platform and participants with rules on how to ensure integrity and functionality, ways of disputing a solution, implications and others. It is incumbent upon SEAMLESS partners to agree standard clauses and issues regarding this document. It is also possible to try to identify insurance possibilities for the SEAMLESS platform, although e-commerce insurance is still in its infancy and it is not fully investigated on such a platform as SEAMLESS.

Ontology will support standardization and multilingual issues in the field of product categories, product attributes, business documents, contract clauses, etc. Ontology will be affected by mentioned trust mechanisms and according to accepted strategies.

According to survey results, both services are really necessary and if they are to be developed professionally, it will be a significant element for increasing trust in the SEAMLESS platform.

Strategies for increasing trust by standardization of business activities

Strategy	Description
S 8.1	According to the previous strategies defined for the trust building mechanisms, ontologies

	should be extended with the following terms and concepts: *Certificate categories*. Each certificate category is represented as a localizable term. Additionally, search of companies will be extended so it will be possible to find a company with the specified type of certificate. *Base contract clauses*. Clauses are added as the localizable terms for the clause text and description, which explains clause application and consequences. Clauses can be additionally organized in the hierarchies and can be parameterized with the dynamic data fields. However, base clauses do not support automatic dataflow and data has to be always entered manually. *Dataflow rules for the business documents*. Dataflow rules allow automatic integration of outputs from one business process into the business documents required in the subsequent processes. This is related to the contract clauses and contract proposal mainly, but other documents like RFQ/RFP, quotation, order and invoice are affected too. To ensure maintenance, the rules cannot be "hardcoded" in the business processes and should be specified as the integral part of the ontology in a declarative way. For the standardization of business processes and fair practices, especially Code of Conduct and Terms and Conditions have to be developed. These two agreements can be integrated. These documents should be developed before or within the pilot phase. Business partners have to agree on the conditions of these documents in the registration phase. **Benefits**: Localization, standardization, data integration, formal description of negotiation and contract execution processes (useful for ODR). Clear picture of expected behaviour and implications from unfair practices. **Risks/disadvantages**: Additional cost to maintain ontology (this includes costs for localization of the additional ontology terms by mediators or costs for integration of outsourced vocabularies (for example, the catalogues of contract clauses). Impact on: T2.1, T2.2
General impact on:	Together with mentioned impacts according to strategies and mechanisms, T3.2 should ensure technological concept of trust mechanisms and cooperation communication. These impacts, mainly technical are only proposal and should be discussed more in details within technology WPs.

6.2 Modelling and description of operational scenarios

For the description of using implemented trusted building mechanisms, we will illustrate in this section the business processes modelled in UML according to particular business/contractual phase. SEAMLESS presence begins with the registration and creation of the first company profile. After registration and validation of the information in the company profile, the company will be able to start conducting business with described activities. Each activity is described regarding the considered strategy and used trust building mechanism is presented.

6.2.1 Impact of trusted operational scenarios

Generally, all companies proclaim low trust in the technology as a barrier to conducting business through the Internet. It reflects the fact, that they have a problem in trusting unknown companies and in starting negotiations with them. Paradoxically, the high number of potential business partners is disadvantage as

they have no possibility of checking all or part of them. This barrier determines obtaining competitive advantages achieved from negotiated better business conditions such as price, quality, maturity dates, etc.

The main impact of joining an e-marketplace and using e-business services is that they can improve the effectiveness and efficiency of their business activities. But mainly, symbiosis of electronic communication, e-business transaction mechanisms, the high number of potential partners, and especially trust building mechanisms can imply multiplication effect of e-marketplaces services in the field of economic impact on business processes.

Another multiplication effect has also emerged. Trust building mechanisms imply an increased number of participants and high number of participants can increase cross-border collaboration, which will aid competitiveness in the global market and a higher economy performance in relevant regions. Such an environment will help companies from poor regions and transfer know how and better technologies to them.

Regarding the behaviour of companies in the electronic business environment, the implementation of trust building mechanisms will imply also fairer business and avoid speculative and un-fair practices, which have often harmed companies.

Dissemination and integration of efficient and effective trust building mechanisms into single European electronic market will fulfil the initiatives of the European Commission for achieving competitive and efficient electronic marketplaces.

6.2.2 Registration phase on the SEAMLESS

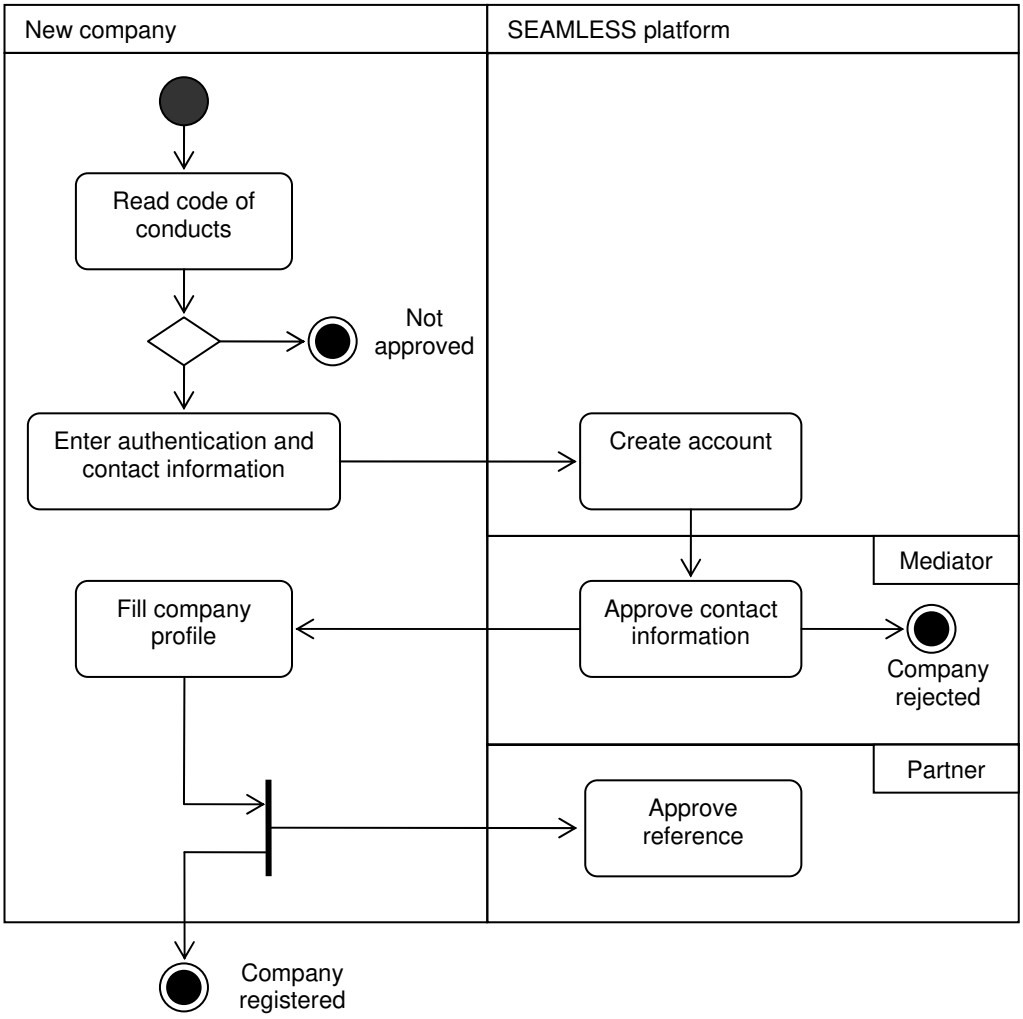


Fig. 15 *Registration phase modeled in UML*

Activity	Trust building strategies	Mechanisms
Company is going to register on the SEAMLESS platform. Necessary activities are described below.		
Reading "code of conducts"	"Code of conducts" helps company to understand all discretions, duties and terms. This document will select and reject companies which won't accept platform's rules	Service agreement (S8.1)
Enter authentification and contact information	It will be necessary for company to fill minimum of requested information (contact information)	
Account creation	Platform creates account for company	

Approve contact information	Mediator approves contact information. This activity helps to identify effort of some companies to multiple registrations.	Validation of company information (S1.1, S1.2)
Company is now registered and all necessary trust building information is verified.		
Fill company profile	Company could enter the SEAMLESS platform and fill profile. In the company profile there is contact information, information about products and company, status of business activity, certificates, references and preferences for reference, ODR and Escrow activities.	All mechanisms from the chapters 6.1.1 to 6.1.4, ODR and Escrow preferences (S2.1, S2.2, S3.1, S3.2, S4.1, S4.2)
Company, at this time, could use services provided on the SEAMLESS platform (searching, adding references…etc).		
Approve reference	Partners within SEAMLESS (if existing) approve references for this company. Internal references from SEAMLESS platform won't be visible to others before partner's approval	References (S 3.2)

6.2.3 Searching for business partners

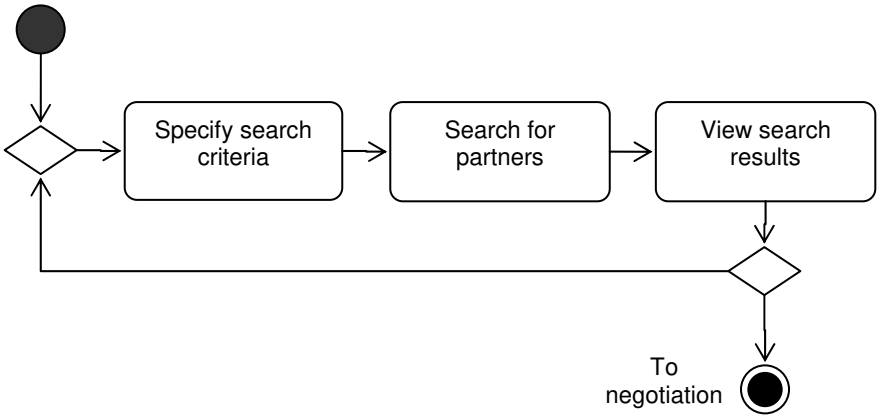


Fig. 16 *Searching for the business partners modeled in UML*

Activity	Trust building strategies	Mechanisms
Registered company is looking for business partners.		
Specify search criteria	Company can define search criteria. Besides basic search criteria (country, sector, product families…), company can select trust building search criteria	All mechanisms from the company profile (S2.1, S2.2, S3.1, S3.2, S4.1, S4.2)

	(information from company profile like certificates, references, feedbacks, rating, historical aggregated data or preferences)	
Search for partners	According to selected criteria system finds partners	
View search results	Platform displays search results with possibility of sorting.	Mechanisms from the company profile (S2.1, S2.2, S3.1, S3.2, S4.1, S4.2)
Company can start negotiation with displayed candidates.		

6.2.4 Negotiation and contract proposal creation phase

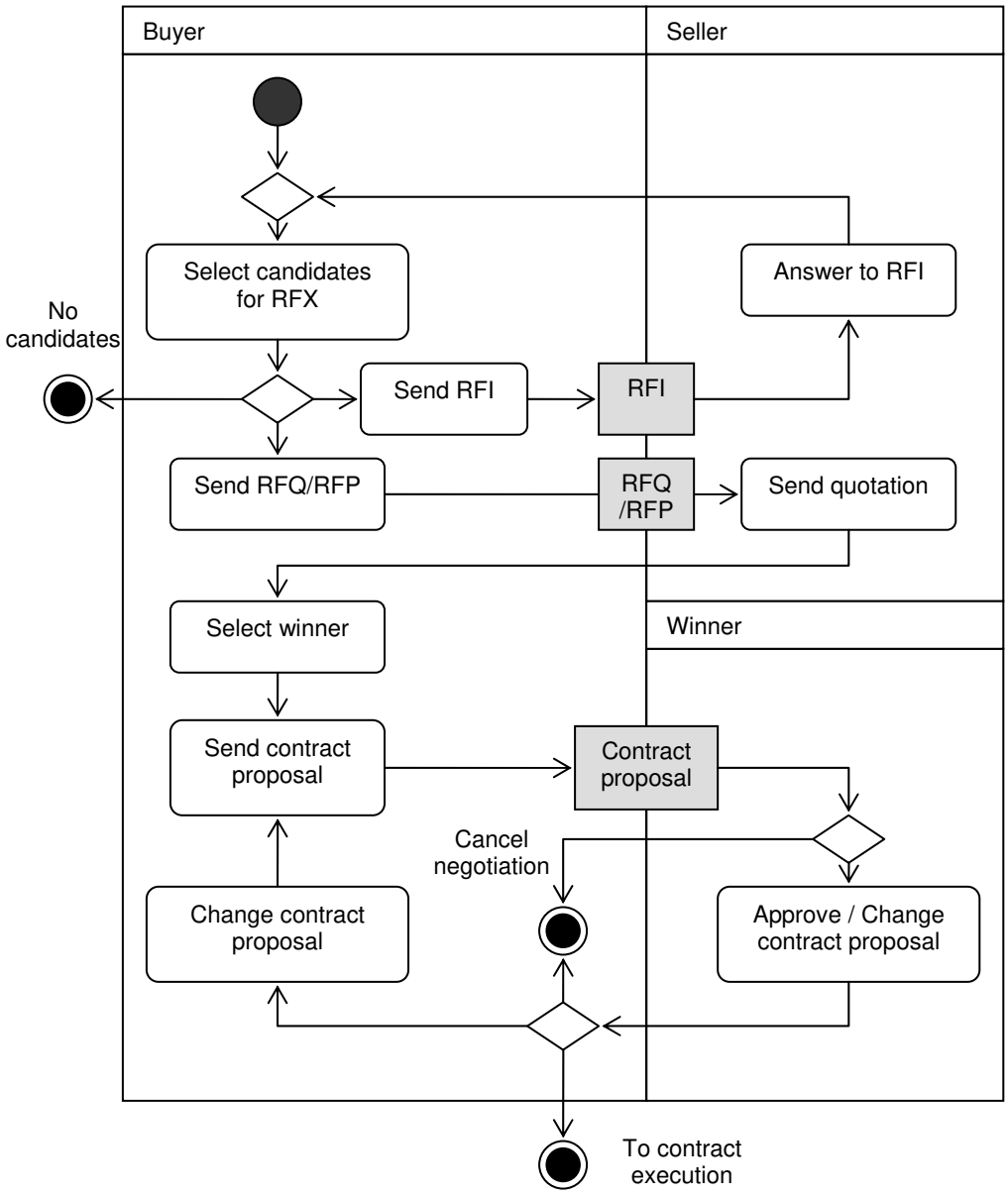


Fig. 17 *Negotiation phase modeled in UML*

Activity	Trust building strategies	Mechanisms
Registered company is starting negotiation with displayed candidates		

Select candidates for RFX	Company can select candidates from reference list or from searching results. Important trust building attributes are visible. (selected data information from company profile)	Mechanisms from the company profile (S2.1, S2.2, S3.1, S3.2, S4.1, S4.2)
	If company chooses candidate directly from reference list it is not necessary to create RFI (in this case company creates RFQ/RFP)	
Send RFI/Answer to RFI	RFI is not formalised document and this means that in many cases can not be translated (free text). RFI can be used also for requesting samples.	Recording (S5.1, S5.2)
Send RFQ/Send quotation	RFQ/RFP are formalised documents so at the platform can be translated.	Recording Ontology (S5.1, S5.2)
Create/Send/Change/Approve contract proposal	Company can create contract proposal by using basis clauses and templates and explaining (S 5.1) For contract creation can company also load previously saved template. (S 5.2) System will automatically integrate negotiated data to contract proposal (5.3.) Company can use outsourced comprehensive specialized database of clauses and templates (S 5.4) Consequently company sends proposal for modification until it is approved by both partners.	Recording Integration of negotiated data Basic clauses and templates Specialized db of clauses and templates Explaining clauses and templates (S5.1, S5.2, S5.3)

6.2.5 Contract execution and settlement phase

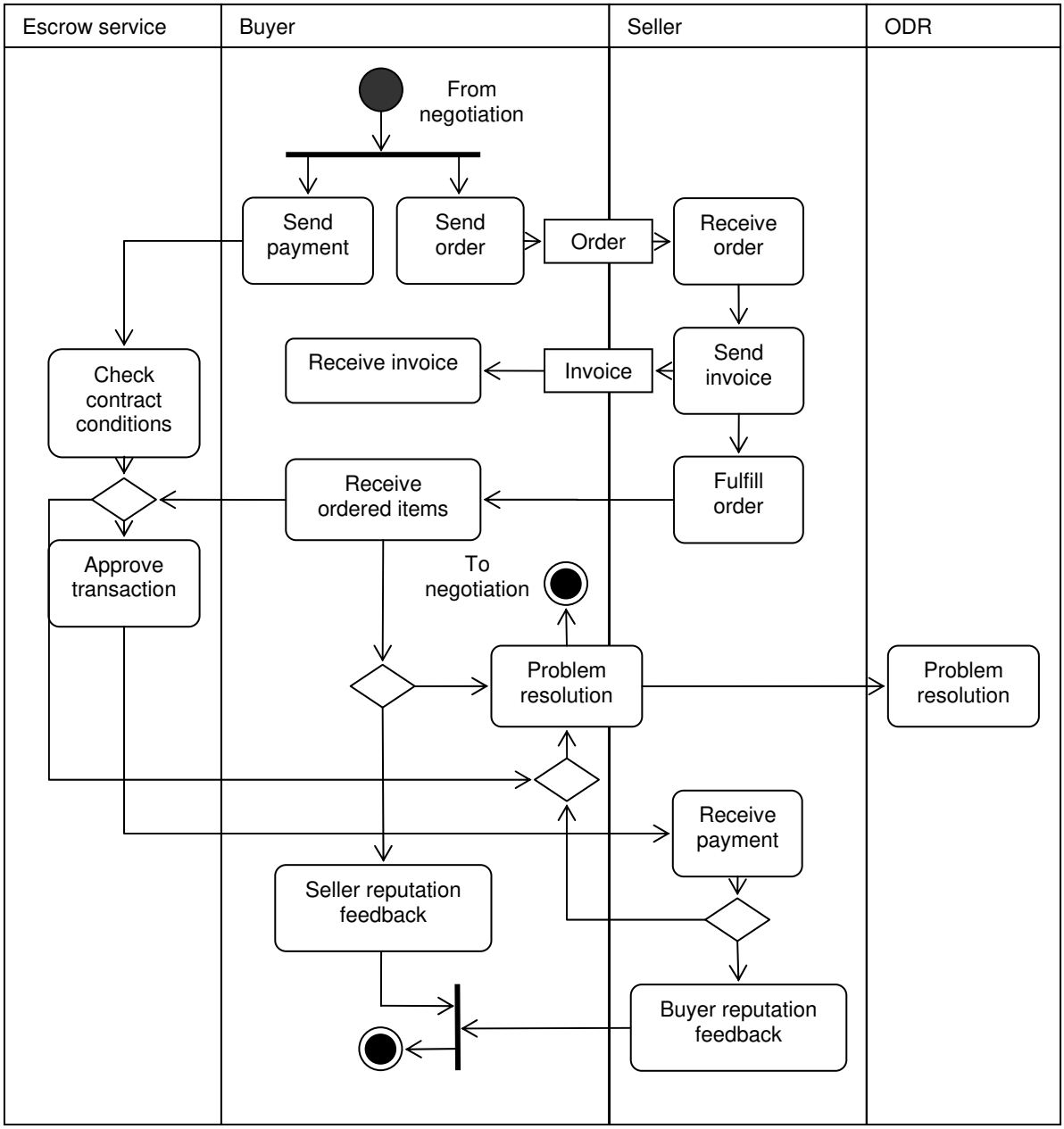


Fig. 18 Contract execution and settlement phase modeled in UML

Activity	Trust building strategies	Mechanisms
Send order/invoice	Company can manually create and send order/invoice (S5.1. and S5.2)	Recording (S5.1, S5.2, S5.3) Integration of negotiated

	Company according to negotiation send order/invoice. Documents are automatically generated from negotiation outputs (S5.3. and S5.4) This mechanism increases trust because it could help avoid mistakes in order and invoice filling	data, Ontology
Receive order/invoice	Partner receives order/invoice	Ontology
Seller fulfills order and buyer receives ordered items		
Problem with goods and services is identified (by partners)		
Problem resolution	Partners can solve problem without platform (small problem – current practice) Partners can solve problem within platform (small problem) and problem solving flow into new negotiation Partners can solve problem within platform (bigger problem) and can use ODR according to used strategy (S6.1 – S6.4)	ODR, recording, Service agreement, Escrow service, all mechanisms from reputation block (S 6.1-6.4)
In the case of Strategy 7.1. – 7.3.		
Check contract conditions	Buyer sends payment to Escrow partner (Internal, Bank or ES provider – according to used strategy) and he checks contract conditions at all steps of the contract	ODR, recording, Service agreement, Escrow service (S 7.1, S7.2)
Approve transactions	Buyer approves transaction and Escrow partner sends payment to Seller In the case of problem see Problem resolution	(S 7.1, S7.2)
Seller/Buyer reputation feedback	Partners (Seller/Buyer) can give reputation feedback to each other. (S 4.1). The feedback can be focused on several contractual issues (payment, quality of product, after sale service, delivery,...). Partners can use discussion forum for discussion of some problems emerged or appreciation of behaviour.	All mechanisms from reputation block, company profile (S4.1, S4.2)

7 List of scenarios elements and recommendations

Strategy	Dependencies	Trusted mechanisms	Specifics	Recommendation 1 low 2medium 3 high	Impact on	Condition for implementation
S1.1	No	Contact information General information Product categories Detailed product description Company's focus Financial information	Validated by mediator Validated by mediator Supported by ontology Supported by document upload Supported by document upload or web link Not validated.	3R	T1.3 T4.2	Validation strategy and acceptation by mediators
S1.2	S1.1	Status of business activity	Integration with national registries or other form of online update of changes in registries relevant to the SEAMLESS participants.	3R/F	T1.3 T4.1 T4.4	Existence of the service in relevant countries
S2.1	No	Certificates	Certificates with contact info for validation	3		
S2.2	No	Certificates	Certificates and categories of certificates supported by ontology. Possibility to use category as search parameter.	3R	WP2 T2.3, T2.4 T4.1	
S3.1	No	References	References will be published without possibility to verifying and refusing the partner.	2	WP4	
S3.2	S3.1	References with approval of publishing	References will be approved by each partner. Possibility to check default approving.	3R	WP4	
S4.1	No	Feedbacks, rating, discussion forum	Feedback is possible on several aspects of transaction or in general. Rating and feedback is weighted by rater ranking.	3R	T1.3 WP3 WP4	
S4.2	S4.1	Feedbacks, rating,	Aggregated data for past activities and behaviours	2F	T3.3	

		discussion forum. Historical statistical data	(public and non public).			
S5.1		Basic clauses, templates and explanations. Recording.	Small database of often used templates and clauses with explaining. Recording of documentation and information flow for purpose of ODR processes.	3R	T1.3, T3.3 T4.2, T4.3	
S5.2	S5.1	Basic clauses, templates and explanations. Recording. Integration of negotiated data into contract templates.	S5.2 + dataflow rules	2F	T3.3, T4.2, T4.3	
S5.3	S5.2	Basic clauses, templates and explanations. Recording. Integration of negotiated data into contract templates. Outsourced specialized database of CCT.	S5.2 + dataflow rules with comprehensive database of contract clauses and templates for the additional fee.	2F	T3.1, T2.1, T4.4	Identification of acceptable specialized company.
S6.1	No, but suitable S5.1	List of ODR experts. Guide to dispute resolution. (Recording).	Even if only list of ODR experts is provided, providing of recorded information flow would be helpful.	3R	T1.3, T3.3	Find and create the guide.
S6.2	S5.1	Internal mediation. Recording.	Evidences from the platform and mediation of problem solving by agreed internal expert.	2	T1.3, T3.3, T4.3	Internal ODR expert selection.
S6.3	S5.1	Strategic alliance with specialized ODR company.	Not integrated ODR solution of specialized company. Account for ODR company will be created. Access to recorded evidences.	1F	T1.3	Identification of acceptable ODR provider.

S6.4	S5.1	Strategic alliance with specialized ODR company.	Integrated ODR software solution of ODR company.	2F	T1.3, T4.4	Identification of acceptable ODR provider.
S7.1	No. S5.1 would be suitable.	Internal ES. (Recording)	ESP will be selected mediator. ES communication on the platform. Checking of price and delivery.	3	T1.3, T3.3	Internal ES provider selection. The best solution - one bank for all SEAMLESS participants.
S7.2	No. S5.1 would be suitable.	Strategic alliance with bank. (Recording)	Difficulties in submitting original documents. Agreement with selected bank is needed. Most requested model. Checking of price and delivery.	3F	T1.3, T3.3, T4.4	Identification of acceptable bank. Possible integration.
S7.3	No. S5.1 would be suitable.	Strategic alliance with specialized ESP. (Recording)	Agreement with selected ESP is needed. Most professional model with possibility to check also quality.	2F	T1.3, T3.3, T4.4	Identification of acceptable ESP.
S8.1	No.	Code of conduct. Service level agreement. Terms and Conditions. Ontology.	Acceptance of rules in registration phase.	3R	T2.1, T2.2	Agreements creation. Ontology modification.
Comments: R – recommended for initial phase, F – long term recommendation, Ranking 1-3 is based upon our survey						

8 Conclusion

Identified trust building mechanisms varied according to their complexity and acceptability, especially among low e-skilled companies. Appropriate selection and user friendly implementation can enhance trust and liquidity on the SEAMLESS platform.

According to the survey, differences in company responses resulting from different size were small. Furthermore, it revealed interesting variations among different levels of companies' e-skills. The survey also exposed, that the higher the e-skills of the company, the higher is the trust in more sophisticated mechanisms and acceptance of comprehensive solutions for additional fees (solutions outsourced from specialized companies). However, the results imply, that not all of the trust building mechanisms need to be implemented at the initial phase of the SEAMLESS project because many participants have low e-skills. Nevertheless, after achieving certain skills and experience, the preferences shift to those, similar to e-skilled companies. It means that in a future scenario, it is recommended to use the scenario with enhanced trust building mechanisms as it is presented in Chapter 7.

As for the minimum set of trust building mechanisms, the results identified mainly general information with the business status ,certificates, references, combination of positive and negative feedbacks, rating, basic contract clauses and explanations, advisory for ODR, technical support, code of conduct and escrow services.

In addition, the analysis identified two basic strategies– the short and long term. The short term strategy represents the set of required trust building mechanisms for every level of company e-skills. The latter one reflects gained experience and e-skills on the SEAMLESS platform in the future. In this case, the outcomes of long term strategy will reflect responses obtained from high e-skilled companies.

However, some strategies should be examined in greater detail to find the best solution in the near future. The example is ODR or Escrow services. Although an escrow service was identified as a crucial factor, more detailed analyses regarding the business model would be needed. More than 40% of companies request the bank provided ES as a necessity. Yet they would also trust to other ES providers. It depends on the range of services, fee policies, levels of automation, implementation costs and others. Some of the strategies will affect the mediator´s effort by validating information or they will require additional effort for the application and ontology development.

In the end, the research conducted within this report reveals interesting patterns and differences in trust levels of trust building mechanisms. It also introduces new issues, which can be analyzed in forthcoming investigations such as the financial performance of different strategies, shifts in trust perception after gaining additional e-skills and more detailed analysis on best business and organizational models of trust building mechanisms and strategies. To sum up, in the near future, we can expect the convergence of some trust building mechanisms, especially the ODR and ES, into a single and fully integrated service. In this case, the open architecture of the SEAMLESS platform can provide another valuable opportunity, since the integration of various trust building mechanisms can have synergistic effects on the trust.

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List of figures

Annexes

Annex 1 Questionnaire for trust analyses

Trust building mechanisms

SEAMLESS internal questionnaire

Introduction

Conducting business on the Internet especially on e-markets is determined by many factors. One of the most important factors is trust. Many companies in e-markets have to cope with unknown participants, quality and reliability of their products and companies' references, uncertainty in solving the problems raised from online business etc. How can they ensure that the potential partner is reliable, is it really the company it seems to be, what reputation has it got etc. And furthermore, is the mediator who provides services trustworthy or not?

For that purpose, trust-building mechanisms are implemented to provide e-market participants with confidence in the services and in the business process.

Within the SEAMLESS project focused on developing the trusted online business environment, we would like to analyse the requirements of the trust issues regarding the e-market. We would like to ask you about your perceived required level of trust in order to have a really trusted and useful online environment for conducting online business between international business partners.

The questionnaire has been designed to discover the criteria and necessary elements to develop the online environment, which will be useful and used by your company for conducting international business. This environment will provide functions such as searching the partners selling or buying specified products, negotiation support (request for quotation, information, auctions), on-line ordering and collaboration (contract execution support), multilingual support (the system will automatically translate some procedures and documents).

For that purpose we would like to ask you for cooperation and help by trust analysis.

Please, specify which of the following information will improve your trust to start business with companies on the e-market:

In the first column please specify, in what level will the trust element increase your confidence in the online business environment (please think about importance or frequency of potential use). For assessment use the scale 0 - not significant, 1 – medium significance, 2 - high significance.

In the second column, please think about (minimum set of) necessary elements which an online business environment has to have in order for you to join it. Please think about the elements in the same way that you would information that you have requested from some unknown company and that can also be requested from your company and provided for potential partners on the e-market. Please check by N "necessary" trust elements for joining the e-market.

The Questionnaire

Your company is mainly acting as:

☐ Seller

☐ Buyer

☐ Seller and buyer

Your company is:

☐ Micro (0-9 employees)

☐ Small (10 – 49 employees)

☐ Medium (50 – 249 employees)

☐ Large (250+ employees)

Your business partners are mainly:

☐ International

☐ Domestic

☐ International and domestic approx. at the same level

Your experience in electronic commerce:

☐ No experience

☐ Low experience (using the Internet for searching web pages of companies, e-mail)

☐ Experience with internal ERP, e-business solutions (internal system for e-procurement, electronic catalogues, document online exchange…)

☐ Experience with electronic marketplaces

1.	**General information about the company** General information about the company provides the basic legal and business information about the company wanting to register on the system. Information is verified by trusted mediator and used as required for registration into the system. Together, it will be used as criteria for searching tool.	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**
1.1	Contact information (name and address, legal form, web page, contact person, etc.)		
1.2	**Information about the provided products/services**		
a.	description of company's focus		
b.	product/service categories		
c.	detailed product/service description		
d.	Please specify additional information, you would expect:		
1.3	**Information about the company size**		
1.4	**Year of foundation**		
1.5	Status of business activity (i.e. valid, bankrupt, winding-up)		
1.6	**Please specify additional information, you would expect:**		

2.	**Certificates** Certificates are used for describing some quality of the products and services. In 2.1 please answer, in what level will your trust increase if national certificates or marks are provided, it means certificates you know on your local market. In 2.2 please answer, in what level will your trust increase if national certificates or marks from abroad are provided, it means certificates you possibly will not know as it is national certificate from other country. In that case, such a national certificate or mark will be linked with a national source as evidence and more detailed description. Existence of such a certificates or marks can be also used as criteria for searching.	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**
2.1	Nation level certificates or marks (e.g. mark of quality, Top/Best company in industry, etc.) of companies on the local market (in the same country)		
2.2	Nation level certificates or marks (e.g. mark of quality, Top/Best company in industry, etc.) for foreign companies		
2.3	Known international established certificates, e.g. ISO		
	Other:		

3.	**References** Every company can add to the description the list of references for presenting some historical activities and reputation.	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**
3.1	List of important business partners (suppliers and customers)		
3.2	List of conducted business (e.g. known buildings, clothing collection, etc.)		
	Other:		

4.	**Reputation** Reputation can be based on and developed by some kind of feedback. The basic approach is providing the positive or negative feedback on already conducted business transactions. Feedback is usually divided to several sub-indicators according to side of business (buyer, seller) as quality of product/service, delivery, payment, service, etc. Feedback can be supported by forum to provide aggrieved party to response on esp. negative feedback. The feedbacks are usually aggregated into simple rating (aggregated number) shown as some pictogram (e.g. stars). It can be also used as criteria for searching. Together, the business environment can provide statistical information about business activity of the company to find how successful it is in some business transaction or how often is positively or negatively ranked.	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**
4.1	Positive-only feedback from the partners		
4.2	Positive and negative feedback from the partners		
4.3	Discussion forum where partners of the company have the option of adding some comments about trading with concerned firm.		

4.4	Reports with aggregated historical data about the platform business activities of the company (i.e. response time intervals for the various negotiation processes, how many times was ranked company involved in the tender based on the user's discovery of services/products, or how many times was selected for the contract, etc.)		
4.5	Rating presented as a simple symbol/ (e.g. number of stars ****) or number for example percentage with presenting the number of total transactions, e.g. 60%/50 (total transactions). It present the trust rating in the scale 0-100.		
	Please specify other issues:		

5.	**Contract negotiation platform** Contract execution is often difficult for SMEs in cross-border relations. The system could provide tools to simplify business transactions as for example monitoring for mistakes or automated filling the data. For contract development, it can offer templates with the explanation to make the contract easier and faster or offer possibility to save some contract/document for future needs. For the purpose of evidence by some disputes or for court, recording of negotiation and contract process is provided in secure way (readable only to relevant institution or subjects when some problem emerges).	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**
5.1	The integration of business negotiation outcomes into the contract		
5.2	Contract negotiation process tracking and recording (according to requested privacy level)		
5.3	Basic contract clauses and templates		
5.4	Database/service with complex contract clauses for the fee provided by specialized company.		
5.5	Explaining contract template clauses and conditions		
	Other – please specify:		

6.	**Online dispute resolution ODR** It is always possible that in business relations some problems emerge. If the problem is serious, the solving through the court is long and expensive. For that purpose alternative dispute resolution systems or services were developed. Online dispute resolution - ODR refers to processes other than judicial determination in which an impartial person (third trusted party) assists those in a dispute to resolve the issues between them with use of ICT. They are provided by trusted and agreed third party/subject, which is trusted to both - buyer and seller. The buyer and seller will agree that the final decision made by this dispute resolution expert will be accepted by both sides. The expert has often extensive experiences in such a field and is supported by the online system with data relevant to the business case. ODR is provided according to level of problem complexity (the limited complexity means low and medium problem which can be solved by providing the recorded data as	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**

	an evidence; more difficult problems are usually solved by external specialized ODR company).		
6.1	Advisory support - Recommendation of ODR experts to users, what steps should be taken?		
6.2	Technical support - support by solving technical problems		
6.3	Limited ODR – till some level of complexity		
6.4	Outsourced ODR service by specialized company		
	Other – please specify:		
7.	**Escrow services** Escrow services are services provided for ensuring the payment against the delivery. It reduces the potential risk of fraud by acting as a trusted third party (ESP) that collects, holds and disburses funds according to Buyer and Seller instructions. The ES subject will receive the money from buyer and wait for confirmation that delivery is ok. After the confirmation the ESP will send the money to the seller.	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**
7.1	Internal service, where mediator is acting as ESP with appropriate bank account		
7.2	Bank will be the mediator through documentary credits		
7.3	Trusted Third Party – outsourced specialized company will provide the services		
	Other – please specify:		
8.	**Standardization** Multilingual support will allow the submission of the offer or search for the data in native language. Automated translation will be provided. It guarantees to use right words and terms. Code of conduct is a system of rules that participants agree to follow, which can include not only basic terms and conditions, but also procedures needed to be taken in the case of some problem, how to use some tools, consequences of unfair practices, etc.	**Element increasing confidence** **0/1/2**	**Necessity of element** **N**
8.1	Multilingual support with standard terms		
8.2	Code of Conduct		
	Other – please specify:		

In e-market, all services or information can be delivered for a fee. Some companies prefer limited services or information for free (for example limited database of contract clauses mostly used) some would prefer complex mostly outsourced service or information although for some fee (for example database with thousands of contract clauses).

9. Which model would you rather accept?

access to information/service provided by external provider for a fee ☐

access to information/service limited, free of charge ☐

When some company is examining a potential partner, this company would usually like to see also negative feedbacks about this potential partner. In this case it is usual that this company will also agree to publish their negative feedbacks. It means that for accessing some information, the company is also requested to offer such information.

10. Would you accept the option of viewing all ratings/feedbacks but only if you also have to rate all transactions?

Yes ☐

No ☐

11. What in your opinion are the crucial factors of trust in the mediator on e-markets?

12. Can you name organizations perceived by you as a trusted mediator for:

- companies data verification

- ODR

- escrow services

- in general

Annex 2 Code of Conduct Best practice Checklist

The Best Practice Checklist contains a list of questions that is indeed to quality a Codes of Conduct of Trust Mark in the area of raising user confidence in the B2B e-marketplace that uses them.

Below is a complete list of all the questions in the checklist:

1. The scope

(a) Who has drafted the Code of Conduct (i.e. the operator, representatives of the buyers, representatives of the suppliers or all of these)?

(b) To which form of B2B Internet trading platforms does the Code of Conduct apply?

2. General questions

(a) Does the Code of Conduct stipulate how to bring the participation terms to the participants´ attention?

(b) Does the Code of Conduct stipulate training opportunities for potential participants in order to make them familiar with how transactions are carried out?

(c) Does the Code of Conduct refer to neutral third party auditing or certification of the Internet trading platform (e.g. regarding compliance with the Code of Conduct)?

3. Information about the Internet trading platform

Does the Code of Conduct require that information be provided about…

(a) name, address, legal status and VAT-number of the Internet trading platform?

(b) legal liability of the Internet trading platform in the case undertakings from participants are not fulfilled (or the use of an escrow service)?

(c) legal liability of the Internet trading platform in case the procedure of making transactions is hampered?

(d) number of participants, transactions and business volume transactions?

(e) any connection between certain participants and the Internet trading platform operator?

(f) the bargaining power of participants?

(g) how to make a calculation of return for potential participants?

4. Information about the participants

Does the Code of Conduct…

(a) stipulate how participants should be scrutinised as to their qualifications and capacities before being allowed access to the Internet trading platform?

(b) stipulate exclusion conditions?

(c) make recommendations concerning rating systems of participants´ trustworthiness?

(d) stipulate to what extend the participants´ identities of are disclosed or secret before, during and after the bidding procedure?

(e) address the issue of liability in case of breach of contract (liability for the operator, for the counter party in breach of for insurance companies) and any use of escrow services?

5. Transaction process model

Does the Code of Conduct…

(a) describe how the process of making transactions at the Internet trading platform functions?

(b) specify when in time the conditions for a transaction should be provided to the participants?

(c) specify how and when a transaction is competed (e.g. whether hidden reserve price is allowed in auctions)?

(d) specify to what extent it is possible to withdraw, retract or cancel invitations, bids or other transactions and what are the consequences?

(e) specify who is allowed to make transactions (e.g. whether the auctioneer/invitor or operator is allowed to submit bids)?

(f) stipulate whether transactions can be changed (e.g. whether a lot can be divided or by how much each bid is increased/decreased in an auction)?

(g) stipulate what factors should be relevant for concluding a transaction (e.g. whether other factors than the price is relevant to determine the winning bid in an auction)?

(h) stipulate who bears the risk for input errors and other mistakes?

(i) stipulate which or whose general terms and conditions are applicable to the transaction?

(j) specify to what extent the transactions can be tracked (e.g. when goods sold have been shipped)?

6. price setting mechanism in auction and exchanges

Does the Code of Conduct…

(a) to what extent information should be provided about the identity of bidders and the price levels of each bid?

(b) whether bids from the initiator or from the operator ("puffing") are allowed?

(c) what information should be communicated to whom concerning the identity of the bid winner and the content of the winning bid?

(d) how auction rings, bid shielding and other collusion is to be prevented?

(e) any auditing procedures ensuring post-examination of the bidding transaction?

(f) a policy about reporting criminal fraudulent behaviour to relevant authorities and/or the business community?

7. Technical security

Does the Code of Conduct…

(a) include a reference to security standards with the purpose of limiting the risks for technical breakdowns, disruptions and manipulations?

(b) provide how to solve acute technical problems (back up procedure)?

(c) stipulate who bears the legal responsibility for technical breakdowns, disruptions or manipulations?

(d) stipulate procedures for record keeping?

(e) specify an insurance solution for technical security risks?

8. Confidentiality and data protection

Does the Code of Conduct

(a) stipulate how confidentiality is ensured?

(b) stipulate who bears liability in case there is a breach of duty to keep information confidential?

(c) prescribe the intellectual property rights for participants´ submitted information?

(d) refer to a privacy policy?

(e) if a privacy policy is referred to, does this policy contains provisions on:

- when information is collected?
- what information is collected?
- for how long time the information is stored?
- how the information is processed (is it used to build up profiles of the participants?)
- to what extent information is disclosed to third parties?
- what rights there are to demand corrections of deletion of information?
- who has access to what type of information

9. Applicable law

Does the Code of Conduct…

(a) require that the applicable law be specified (with respect to contract law, competition law, and public law)?

(b) make reference to generally accepted principles of international commerce (e.g. UNIDROIT Principles of International Commercial Contracts)?

10. Dispute resolution

Does the Code of Conduct…

(a) give reference to fair dispute resolution scheme?

(b) stipulate the use of a permanent dispute resolution board?

(c) stipulate how a claim should be submitted?

(d) stipulate how to get access to information to relevant transaction data in case of a dispute?

(e) stipulate the timeframe within which to handle a dispute?

(f) stipulate who is to bear the costs for dispute resolution?

(g) stipulate to what extent the decisions may be appealed?

(h) describe how decisions can be enforces?

Souce: Bjørn Borg Kjølseth Applying Codes of Conduct and Trust Marks, eMarketservices August 2005,

Annex 3 Example of contract

CONTRACT FOR THE PURCHASE AND SUPPLY OF GOODS

This Deed of Agreement is entered into as of the Effective Date identified below.

BETWEEN [Name] of [Address] (To be known as the (Supplier) in this Agreement)

AND: [Name] of [Address] (To be known as the (Purchaser) in this agreement)

WHEREAS (Supplier) desires to enter into an agreement to supply (Purchaser) with [Item] (To be known as (Goods) in this Agreement).

NOW IT IS HEREBY AGREED that (Supplier) and (Purchaser) shall enter into an agreement subject to the following terms and conditions:

1. Definitions and Interpretations

1.1 Price, Euro or EUR is a reference to the currency of the [Country] unless otherwise stated.

1.2 This agreement is governed by [Country] law and the parties hereby agree to submit to the jurisdiction of the Courts of the [Country] with respect to this agreement.

2. Commencement and Completion

2.1 The commencement date is scheduled as [date].

2.2 The completion date is scheduled as [date].

2.3 The schedule may be modified by agreement as defined in Section 9.

3. Purchase Orders

3.1 The (Purchaser) shall follow the (Supplier) price lists.

3.2 The (Purchaser) shall present (Supplier) with a purchase order for the provision of (Goods) within 7 days of the commencement date.

3.3 The purchase order shall nominate the method of delivery as defined in Section 4.

3.4 Purchase orders are to be sent electronically, and are to be interpreted under standards and guidelines outlined in Supplement A.

4. Delivery

4.1 The (Purchaser) shall arrange for delivery to be made according to one of the following terms:

(a) The shipping and insurance of the (Goods) shall be the sole responsibility of and entirely at the expense of the (Purchaser).

(b) The shipping and insurance of the (Goods) shall be the responsibility of the (Supplier). The (Purchaser) shall provide the (Supplier) at least [days] days notice and pay the carriage and insurance costs from the (Supplier) delivery price list.

5. Payment

5.1 The payment terms shall be in full upon receipt of invoice. Interest shall be charged at [percentage] on accounts not paid within 14 days of the invoice date. The prices shall be as stated in the sales order unless otherwise agreed in writing by the (Supplier).

5.2 Payments are to be sent electronically, and are to be performed under standards and guidelines outlined in Supplement B.

6. Rejection

6.1 If the (Goods) do not comply with the Order or the (Supplier) does not comply with any of the conditions, then the (Purchaser) shall at its sole

discretion be entitled to reject the (Goods) and the Order. The (Purchaser) shall return the rejected (Goods) to the (Supplier) at the (Purchaser)

risk and expense or notify the (Supplier) to collect the (Goods). The (Supplier) may use its discretion to replace the (Goods) according to the

invoice or refund any monies paid.

7. Termination

7.1 If (Purchaser) fails to carry out any of its obligations and duties under this agreement (Supplier) may issue a notice specifying the breach

and request that it be remedied within 14 days after receipt of such notice.

7.2 If (Purchaser) fails to provide adequate remedy within the specified 14 days the agreement may be terminated forthwith.

8. Disputes

8.1 (Supplier) and (Purchaser) shall attempt to settle all disputes, claims or controversies arising under or in connection with the agreement through consultation and negotiations in good faith and a spirit of mutual cooperation.

8.2 This method of determination of any dispute is without prejudice to the right of any party to have the matter judicially determined by a [Country] Court of competent jurisdiction.

9. Amendment

9.1 This agreement may only be amended in writing signed by or on behalf of both parties.

SIGNATURES

In witness whereof (Supplier) and (Purchaser) have caused this agreement to be entered into by their duly authorized representatives as of the effective date written below.

Effective date of this agreement: [day] day of [month] [year]

[Signature]	[Signature]
[Person]	[Person]
[Role]	[Role]
Address for Notices:	
[Address]	[Address]

The report is available only in electronic format and can be downloaded from http://www.seamless-eu.org/deliverables/TrustedOperationalScenarios.pdf.

Kranj, 2007

ISBN 978-961-232-205-2

Published in Slovenia

Project co-funded by the European Commission within the
Sixth Framework Programme, Information Society Technologies (IST)