



TRUST SERVICES IMPLEMENTATION MODEL FOR ELECTRONIC BUSINESS ENVIRONMENT

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Abstract: In the field of digital business environment/ecosystem, the self-regulation feature plays crucial role. ICT support biological and sociological phenomena through efficient electronic services. One of the main roles is building and enhancing efficient relationships between actors within the ecosystem. Problem of interaction between commercial subjects depends on expected benefits/utility. These expectations are predictors of successful result from realized transaction with potential partner. And this predictor is based on trust and trustworthiness. The paper presents trust building services as crucial factor for cooperation and propose trust service model for B2B e-cooperation within digital business ecosystem.

Keywords: trust building, e-cooperation, model, business

Introduction

The characteristics of the e-Commerce transactions are different from those in the traditional world of business. Personal face-to-face negotiation, exchange of information, obtaining references and reputations from customers and partners helps in physical business the transacting companies to use some instincts to build relative trustworthiness of the parties. Together, some legislative framework exists to help in developing an agreeable level of risk as regulatory aspect. The online business environment, where physical contact doesn't exist, is characterized by increasing number of potential unknown business partners. The barrier in technology acceptance is still significant and many old habits and online specifics decrease the possibilities for building e-trust.

In electronic commerce and generally in networked business informatics, trust and security 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.

Trust has been proclaimed as a valuable economic asset because it has been described as an important antecedent to effective inter-organisational collaboration. In several studies, trust is considered as the factor which reduces transaction costs and allows for greater flexibility to respond to changing market conditions¹. Together, it leads to superior information sharing routines which improve coordination and joint efforts to minimize inefficiencies², and facilitate investments in transaction or relation-specific assets' which enhance productivity³. Some studies even claim that national economic efficiency is highly correlated with the existence of a high trust institutional environment⁴. For example, Fukuyama⁵ argues that the economic success of a nation depends on the level of trust inherent in the society.

Several other studies contend that e-commerce cannot fulfil its potential without trust⁶. Lee and Turban⁷ 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. 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 transfer⁸.

¹ F. Nachira, *Technologies for Digital Ecosystem*, accessible from: <http://www.digital-ecosystems.org/> (retrieved: October 2010); J.B. Barney, M.H. Hansen, *Trustworthiness as a Source of Competitive advantage*, "Strategic Management Journal" 1995, Vol. 15, p. 175-190; R. Dore, *Goodwill and the Spirit of iMarket Capitalism*, "British Journal of Sociology" 1983, Vol. 34, No. 4, 1983; J.H. Dyer, *Effective Interfirm Collaboration: How Firms Minimize Transaction Costs and Maximize Transaction Value*, "Strategic Management Journal" 1997, Vol. 18, No. 7, p. 535-556.

² M. Aoki, *Information, Incentives, and Bargaining in the Japanese Economy*, Cambridge University Press, New York 1998; K.B. Clark, T. Fujimoto, *Product Development Performance*, Harvard Business School Press, Boston 1991; T. Nishiguchi, *Strategic Industrial Sourcing*, Oxford University Press, New York 1994.

³ B. Asanuma, *Manufacturer-Supplier Relationships in Japan and the Concept of Relation-Specific Skill*, "Journal of the Japanese and International Economies" 1989, Vol. 3, p. 1-30; J.H. Dyer, *Specialized Supplier Networks as a Source of Competitive Advantage: Evidence from the Auto Industry*, "Strategic Management Journal" 1996, Vol. 17, No. 4, p. 271-292; E.H. Lorenz, *Neither friends nor strangers: Informal networks of subcontracting in French industry*, [in:] *Trust: Making and Breaking Cooperative Relations*, ed. D. Gambetta, Basil Blackwell, New York 1988, p. 194-210.

⁴ F. Fukuyama, *Trust: The Social Virtues and the Creation of Prosperity*, The Free Press, New York 1995; D.C. North, *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge 1990; M. Casson, *The Economics of Business Culture*, Clarendon Press, Oxford 1991; Ch.W.L. Hill, *National Institutional Structures. Transaction Cost Economizing, and Competitive Advantage: The Case of Japan*, "Organization Science" 1995, Vol. 6, No. 2.

⁵ F. Fukuyama, *Trust ...*, op. cit.

⁶ S. Jones, M. Wilikens, P. Morris, M. Masera, *Trust requirements in e-business: A conceptual framework for understanding the needs and concerns of different stakeholders*, "Communications of the ACM", Vol. 43, No. 12, December 2000, p. 81-87; A. Farhoomand, P. Lovelock, *Global e-Commerce – Texts and Cases*, Prentice Hall, Singapore 2001; W. Raisch, *The E-Marketplace – Strategies for Success in B2B Ecommerce*, McGraw-Hill, New York 2001.

⁷ M. Lee, E. Turban, *A Trust Model for Consumer Internet Shopping*, "International Journal of Electronic Commerce" 2001, Vol. 6, No. 1.

⁸ Ibidem.

Trust among partners is one of the most important factors that decide whether the cooperation of companies will occur and in case it occurs, if it will be successful. From several researches and reports conducted in recent years, the set of mechanisms needed for trust has been identified. This set needs to be analyzed with regard to the level of significance to trust building, especially for e-business networks.

Most of European researches were focused on technical aspects of trust and socio-economic issues still absent. By higher socio-economic trust, e-service usage is more intensive and most of economic benefits are obtained. To enhance trust, the next elements for improving confidence in business partners and collaboration environment were identified, esp. reputation mechanisms, online dispute support, standardization activities, contract execution support and escrow services.

There is a lack of empirical knowledge about how trust in the e-marketplace impacts on buyer-seller trust⁹. 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 known¹⁰. Although, some investigations¹¹ conducted later, show several evidences of trust impact. It can be summarized 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 behaviour 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

⁹ P. Pavlou, *Institution-based trust in interorganizational exchange relationships: the role of online B2B marketplaces on trust formation*, "Journal of Strategic Information Systems" 2002, Vol. 11, No. 3-4, p. 215-243; P. Pavlou, Y. Tan, D. Gefen, *The Transitional Role of Institutional Trust in Online Interorganizational Relationships*, Proceedings of the 36th Hawaii International Conference on System Science (HICSS'03), 2002.

¹⁰ P. Pavlou, Y. Tan, D. Gefen, *The Transitional ...*, op. cit.

¹¹ Ch. Kuttainen, *The Role of Trust in B2B Electronic Commerce – Evidence from Two e-Marketplaces*, Doctoral Thesis, Luleå University of Technology, 2005; A. Lancaster, L.F. Lages, *The relationship between buyer and a B2B e-marketplace: Cooperation determinants in an electronic market context*, "Industrial Marketing Management" 2006, No. 35, p. 774-789.

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 Pavlou¹².

- results of the positive correlation of perceived monitoring and feedback to trust in the buyer/seller are contrary, by¹³ were not statistically significant in contradiction to¹⁴. But it was explained by no practical experiences of respondents.

On an open consultation on “Trust barriers for B2B e-marketplaces”¹⁵ conducted by the Enterprise DG Expert Group in 2002, but also in other studies, identified¹⁶ 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. Results in this field were more focused on trust impact than on factors which build trust. The research on significance and acceptance of trust building mechanisms (TBM) absences and is necessary for future development in this field.

If we take into account mentioned approached to trust definition but also the character of electronic business networks with added services possibly provided by external service providers integrated into the platform we can develop our definition. It will better represent our research and practical problems in this field:

“Trust is objective and subjective quantifiable confidence of trustor in some level of competence, truth, security and reliability of other subject or in third party in the specific context built on the base of historical activities and functionalities of environment”.

This definition contains not only interaction between business partners but also in functionalities of environment, where these interactions are created and together, in ability of the environment to manage and maintain these interactions. Managing and maintaining of interactions related to an ability of solving trust disruption and restoring its status.

In the paper, we will propose trust building service model implementation strategy for electronic business platform developed within the eBEST FP7 project financed by European Commission¹⁷.

¹² P. Pavlou, *Institution-based ...*, op. cit.

¹³ Ch. Kuttainen, *The Role ...*, op. cit.

¹⁴ P. Pavlou, *Institution-based ...*, op. cit.

¹⁵ E. Kuller, *Trust barriers for the B2B e-marketplaces*, Report. eMarketservices, June 2005.

¹⁶ R. Delina, V. Vajda, P. Bednár, *Trusted Operational Scenarios: Trust Building Mechanisms and Strategy for Electronic Marketplaces*, August 2007, Moderna Organizacija, Kranj 2007, p. 78; P. Doucek, *Applied information management – Management reference model – Security metrics*, [in:] *IDIMT-2009: System and Humans, a Complex Relationship. 17th Interdisciplinary Information Management Talks*, Trauner, Linz, September 09-11-2009a, Jindřichův Hradec 2009, p. 81-106; P. Doucek, *ICT Human Capital - Research and development work in ICT*, [in:] *IDIMT-2009: System and Humans, a Complex Relationship. 17th Interdisciplinary Information Management Talks*, Trauner, Linz, September 09-11-2009b, Jindřichův Hradec 2009, p. 83-94.

¹⁷ eBEST project: “Empowering Business Ecosystems of Small Service Enterprises to face the economic crisis”, 7th Framework Programme FP7-SME-2008.

Requirements analysis for eBEST implementation strategy

For the purposes of implementation strategy development we have to analyse different trust building mechanisms and their added value for increasing of trust. On the base of the research we will identify and propose most efficient trust building mechanisms for eBEST platform to ensure improved, trusted and effective collaboration environment.

To enhance trust and basic trust marks, the several elements for improving confidence in e-business were identified¹⁸, e.g.:

- *reputation building* – to build credibility through ratings, feedbacks, discussion forums;
- *information quality*, where it is must to ensure that information are correct, valid, up-to-date and potentially validate by third trusted party;
- *certificates and references* to provide quality labels and information about past activities – partners or business information;
- *online dispute resolution support* – 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 negotiate, mediation or arbitration, or a combination of all three supported by intelligent software solutions e.g. for automatic negotiation of penalties etc.;
- *standardization activities* – for ensuring standard, ethic and fair processes and behaviour through code of conduct, interoperability in the exchange of business documents with multilingual support based on ontologies etc.;
- *contract execution support* – support to create a legally enforceable agreement in which two or more parties commit to certain obligations in return for certain rights¹⁹. Efficient support of contract execution support can be achieved for example through contract clauses databases integration with data flow support;
- *escrow services* – which reduce the potential risk of fraud (for example the breach of contract) by acting as a trusted third party that collects, holds and disburses funds according to buyer and seller instructions.

Trust building service model for eBusiness platforms

We can decide for several trust building mechanisms which can be in efficient way implemented into eBEST platform. The base for this decision should be trust significance, requirements and complexity of implementation. On the base of this research we have decided to recommend set of mechanisms with description and implementation rules for eBEST platform described with implementation issues in next chapters. According to the analysis conducted within the project²⁰, the most

¹⁸ R. Delina, V. Vajda, P. Bednár, *Trusted ...*, op. cit., p. 78.

¹⁹ J.A. Reinecke, W.F. Schoell, *Introduction to Business - A Contemporary View*, Allyn and Bacon, Toronto 1989.

²⁰ eBEST project: “Empowering Business Ecosystems of Small Service Enterprises to face the economic crisis”, 7th Framework Programme FP7-SME-2008.

trusted mechanisms are focused on certificates, references and reputation building. Specialised services as ODR and ES are trusted in lower level. That's why we recommend some implementation activities in the field of these trust building mechanisms. Together, we had to take into account some specifics of particular scenarios from chapters above. As in some scenarios, the mediator play a significant role as intermediary and ecosystem shaper, we guess that it would be very beneficial to play also a role of mediator in some dispute solution processes. It means, in the simple way, the mediator can provide some ODR services on basic level as mediation or arbitration.

It has to be noted that other trust building mechanisms not mentioned in the mapping will be supported by the eBEST platform explicitly. Implementation of the electronic business documents and extended automatic dataflow ensures that data will be valid and secure during the contract execution phase. Additionally ontologies incorporated into the eBEST platform can provide support for standardization and multilingual issues in the field of product categories, product attributes, business documents, contract clauses, etc.

Quality 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. We can spread certificates into several groups:

- **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) certificates or the Öko-Tex certificate within textile industry, which is offered by the AITEX organisation (www.okotex.com).
- **national certificates or awards for domestic companies** – Companies usually have a support from the local organizations to obtain local certificates in the easier way. As an example we can name “Slovak Gold Certificate” (www.slovakgold.sk/index.php?lang=EN). 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 GoldBrand.
- **certificates or award of foreign companies (or national certificates pronounced to foreign companies)** - 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.

According to the survey, we have identified two dimensions of certificates: international and domestic.

International certificates were claimed as the most significant and necessary, although we didn't identify significant differences. However, more than 57% of all

companies in both samples (EU and Slovak), regardless of type and size, said that international certificates' added value is highly significant, as they are well established and known. Moreover, around one third of Slovak companies, and 45% of EU companies said international certificates are necessary for them to join the platform.

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

Implementation issues

For the eBEST platform, it would be useful to have types of certificates conceptualised in the ontology, meaning their translation into local languages.

Most important issue is the possibility, to add information about certificates to the eBEST platform in the profile area 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, although in the first phase it would be sufficient to provide classification of two types of certificates – international and national, with profiling as follows:

- Type of certificates – selection from menu “international”; “national”
- Name of certificates – text field, where companies can add the official Title or Name of certificate
- Name of the Certificate authority – text field
- Link of the CA – link field

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.

References can be divided into two groups:

- Business partners,
- Conducted businesses.

In the survey, the references are important trust-building mechanism for more than around 45% of companies in both samples. Moreover, around more than 32% of EU companies and more than 25% of Slovak companies said both of these mechanisms are necessary for them to enter the platform.

Implementation issues

Regarding references on significant partners, the company without a trading history at the eBEST platform, can add in the registration phase “external business partners” (it means traditional business partners apart from eBEST platform). This information will not 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 eBEST 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*”. 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 (text with pictures). Then, mediators will be not responsible for the validation.

To implement this trust-building mechanism, two strategies may be used:

1. An eBEST 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 eBEST 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.
2. An eBEST 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 an 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.

Reputation mechanisms

Under reputation the process of transmitting an image of an actor in a network of other actors is understood²¹. Reputation is also defined as an estimation by others of an “entity’s willingness and ability to repeatedly perform an activity in a similar fashion”²².

Reputation building mechanism can consists of:

- feedback,
- discussion forum,
- rating,
- historical data aggregation.

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 EU companies and 12.5% of Slovak companies said that positive feedback is necessary. On the other hand, over 50% of respondents from both samples said that the combination of positive and negative feedbacks would significantly increase trust and more than 38% of EU companies (32% for Slovakia) marked this model as necessary for joining the platform. Feedbacks should be provided on several business areas, as e.g. payment, service, product quality.

Discussion forum

By feedback forum, 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.

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 and 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 less than 17.4% of all companies would require this service as a pre-requisite for joining the platform and for only 26% of EU companies (34.4% of Slovak companies) would this information significantly increase trust, the implementation is ease, therefore it would be useful to implement.

²¹ R. Conte, M. Paolucci, *Reputation in Artificial Societies*, Mario Kluwer Academic Publishers, Dordrecht 2002.

²² P. Herbig, J. Milewicz, J. Golden, *A model of reputation building and destruction*, “Journal of Business Research” 1994, Vol. 31, No. 1, p. 23-31.

Rating

Rating is presented as a simple mark or number and is calculated on the basis of feedbacks received from raters and their weights. Feedback presented by rating is trust-building mechanism with some empirical support for its effect on buyer-seller trust. According to research, less than 23.5% of all companies request rating as necessity and 29% of EU companies and around 35% of Slovak companies said that rating is highly significant trust-building mechanism.

Historical aggregated data

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, such 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". According to research, 26.8% of EU sample and 9.5% of companies from Slovak sample replied that this information is necessary. Then, 38% of EU companies (and more than 21% of Slovak companies) said that it would significantly increase trust. Although the result for Slovak sample is diametrically different, it would be positive to implement such information.

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. Complex algorithm for rating calculations can harm the trust and usage.

Implementation issues*Feedbacks*

Feedbacks should be provided on several business areas. The companies will have the option of evaluating business partners after a transaction. We propose to use the scale from 0-10, weighting by rating of rater and also present the number of total ratings.

We recommend following feedback areas:

Feedbacks of purchasers:

OVERALL PERFORMANCE – calculated as a arithmetic average of all other feedbacks

COST – satisfaction with prices

DELIVERY/TIMELINESS – satisfaction with fulfilment of negotiated delivery dates.

QUALITY – satisfaction with quality of product or services

BUSINESS RELATIONS – satisfaction with general communication

CUSTOMER SUPPORT – satisfaction with customer after sales care

RESPONSIVENESS – satisfaction with reaction times on sent requests for information

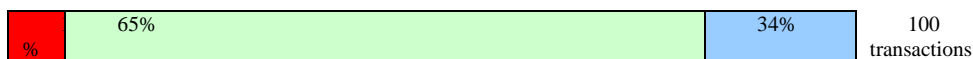
Feedbacks of suppliers:

OVERALL PERFORMANCE – calculated as a arithmetic average of all other feedbacks

BUSINESS RELATIONS – satisfaction with general communication

PAYMENT – satisfaction with fulfilment of negotiated payment conditions

In the profile of the company, the feedback section will provide aggregated feedbacks from all rated transactions with categorization as "positive" (9 to 10), "neutral" (5 to 8), or "negative" (0 to 4) and number of transactions as for example:



Revisiting feedback functionality

Within 30 days of feedback activation, company may receive a feedback revision request (simple private message sending) from the supplier or partner. The company will have 7 days to revise the feedback after the request was made.

How revising feedback for suppliers can be provided:

- Go to *Business Transactions Section* (or any relevant section according to development of platform or directly Feedback section) ; then click *Active Feedbacks* (section where open feedbacks, not rated feedbacks in waiting status are presented).
- Choose the feedback on transaction No ## and click the Revise Feedback button.
- On the Revise Feedback section it can be provided the partner's reason for requesting feedback revisions
- The possibilities will be following:
 - Leave a new star rating by clicking the number of stars
 - Edit the feedback explanation
 - Revise feedback later or
 - The feedback will stay as it is (this information will be sent to the partner as information that it is not in waiting status, but the revision was not accepted).

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) to reduce weight of unfair or not very credible companies.

Rating

Feedbacks from the partners are aggregated to the numerical rating usually presented with graphical marks (stars). 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.).

Historical data aggregation

Historical aggregated data (HAD) should be divided into three groups – public profile data, market data and private data. All groups provide information for easier company decision making process.

Public profile data will be visible to all users of platform in profile section of company. This data describes the company's behaviour. Following statistics can be provided:

- the number of tenders in which the company was involved/the number of tenders in which the company was selected as winner,
- the average time of reaction,
- the frequency of platform presence,
- number of ODR or Escrow service activities,
- number of positive/neutral/negative feedbacks.

These data might help procurement professionals to select more appropriate supplier. For example, in case of accident in company, procurer might be selecting supplier with respect to supplier's average time of reaction.

Private data provides information for internal use only. This data describes the efficiency and the transparency of company's procurement process as it assesses if the company invites "sufficient" number of suppliers to its selection procedure. By word "sufficient" we mean "as good as" the other companies do. We name this indicators "*Procurement Transparency Indicators*" (*PTI*) as they describe the willingness of companies to bring competition into their selection procedures. And as we mentioned while ago, we can also call these indicators "efficiency indicators" as transparency in selection procedure is key factor of procurement efficiency. The efficiency comparison can be provided at the eBEST platform by following procedure.

Platform can compare the assessed company's average number of suppliers invited to selection procedure for specific product with the average number of suppliers invited by other companies at the platform in all selection procedures for specific product family. By average number of invitations we mean average number of RFQs sent by company (companies) to its suppliers. In this case, by RFQ we also mean requests for proposal (RFP) in case the procurement process is finalized with them (after receiving the RFP by company the contract is signed). We suggest calculating weighted average, where the value of contract would be the weight. Mentioned indicators should be both presented one close to other to make the evaluation for eBEST platform users easier. We suggest showing the result of indicator 2 first, and then showing the value of indicator 1 into the brackets so it will be clear to see the difference in assessed company's and competitors' behaviour. Any platform company then can easily assess the efficiency of its procurement.

To make this indicator feasible, we have to mention its precondition - there must be obligation to register products into product families at the eBEST platform.

Market data provides information about relation between demand and supply and can be based on several indicators used for market analysis.

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 process²³ (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 enable that the parties start with negotiation and if this fails, move on to mediation and only if this fails will they resort to arbitration.

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.

²³ J. Hörnle, *Online Dispute Resolution (ODR)*, JISC Legal Briefing Paper, 2004, accessible from: <http://www.jisclegal.ac.uk/publications/hornleODR.htm>

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 web-site, see for example iCourthouse²⁴.

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 particularly 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.

²⁴ www.i-courthouse.com

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.

Enforcement of contract process by mediation and arbitration is illustrated on the following figure:

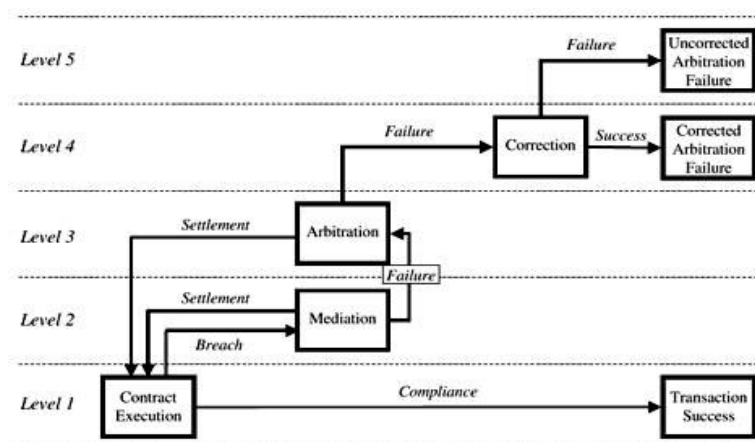


Figure 1. Enforcement of contract process by mediation and arbitration

Source: Own study

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 above. 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.

Generally 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.

Implementation issues

Although our survey show lower requirements of this service especially from lower eSkilled companies, the service could be interesting for more experienced companies and at least by simple level it can provide significant benefits. Together, after some best practices from experienced companies it can also force other companies to use them. We recommend following simple implementation strategies:

List of ODR providers is a minimal service to support dispute resolution. Providing a simple list of experts who can register into the eBEST platform can save time and leave selection to the company. List of ODR experts will be generated according to company profile with type of service: ODR.

Limited ODR is a model, when only the minimum of the ODR services are provided for example basic mediation or arbitration. When more complex problems emerge, external partners are usually offered. In many cases, it can bring efficient and fast problem solving. Provider of this service can be for example the mediator of digital ecosystem in eBEST platform. One of the main basic requirements is the access rights for ODR expert to an efficient source of evidence (access to negotiated contracts, historical activities, etc.). In the case of unsuccessful mediation, partners will choose whether to use a specialized external ODR provider or a traditional court.

Rating of ODR experts. Each ODR service can be rated through rating system with 0-10 scale. Aggregated ratings will be shown in profile of ODR company.

Conclusions

Proposed trust service model for electronic platform with DBE features is the answer for e-market makers to develop suitable functionalities for providing efficient way of conducting business to face the dynamic business environment. The support for the consortium establishing through ecosystem exploration tools and flexibility in business transactions were mostly considered as crucial and required for all operational scenarios. Some of them are more focused on project management where collaboration tools will support negotiations and communication between involved parties. Trust building services can support the usage and participation of companies in digital ecosystem and can force to higher number of transactions. Suitable implementation strategy should consider the eSkills and international experience of users (Delina, R. and Tkáč, M., 2010, Doucek, 2009). From the analysis we have identified, that various eSkills or international experiences have different impact on the trust level into different kind of trust building mechanisms. We have found that higher eSkills increase trust into more complex and sophisticated solutions. It was proposed for initial phase to start with more understandable services as references, certificates, feedbacks/ratings and simple ODR. According to related research of authors, companies with low level of eSkills could have psychological trust barriers to enter into the ecosystem when too complex and sophisticated solution will be provided (Delina, R. and Tkáč, M., 2010). That's the reason why suitable and continual strategy implementation adjustment is required.

In scenarios described above it was identified (eBEST project 2008), that through proposed activities and tools, the platform has a potential to provide:

- Market transparency – visibility of potential supply chain, market information and companies' behaviour what can reduce traditional market inefficiencies. It can result especially in cost reduction based on higher competitiveness in procurement processes, utilizing economies of scale, efficient exploring innovative products or other information.
- Self-regulation for ethical business – esp. rating and feedbacks systems can avoid unfair practices and support ethical conducting of business, what in the final phase reduces transaction costs in the economy. Reputation building mechanisms as references, certificates, ratings or feedbacks are possible to implement and are very suitable in all scenarios.
- More efficient decision making – through new kind and more precise and in time information from the market, interactive collaboration functionalities and better control.
- Increase the flexibility and speed of business transaction – through the character of network e-services.
- And that means - Higher efficiency, transparency and effectiveness on the market accepting win-win approach.

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WDRAŻANIE MODELU USŁUG POWIERNICZYCH DLA ŚRODOWISKA BIZNESU ELEKTRONICZNEGO

Streszczenie: W obszarze środowiska biznesu cyfrowego kluczową rolę odgrywa funkcja samoregulacji. ICT wspiera zjawiska biologiczne i socjologiczne poprzez efektywne usługi elektroniczne. Jedną z głównych ról jest budowanie i wzmacnianie efektywnych relacji pomiędzy podmiotami w obrębie otoczenia. Problem współdziałania podmiotów gospodarczych zależy od oczekiwanych korzyści/użyteczności. Te oczekiwania są predyktorami pomyslnego wyniku ze zrealizowanych transakcji z potencjalnym partnerem. Konstrukcja tych prognoz oparta jest na zaufaniu i wiarygodności. W artykule przedstawiono usługę budowania zaufania jako kluczowy czynnik współpracy. Zaproponowano także model obsługi zaufania do B2B e-biznesowej współpracy w ramach ekosystemu cyfrowego.

Słowa kluczowe: budowanie zaufania, e-współpraca, model, biznes