

NEW TECHNOLOGIES AND PROCUREMENT AND NEGOTIATION PROCESS SUPPORT

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Abstract

The aim of this work is to present innovative IT solutions which can be widely applied in the area of procurement processes and accompanying negotiations, thereby contributing to the assessment of their practical applicability. Particular attention has been placed on Ariba Networks, a platform for procurement management.

This work sources the latest literature in this field as well as research conducted in one of the largest worldwide companies operating in the Polish market of fast moving consumable goods.

Key words: New technologies, negotiation.

Introduction

Globalisation and the internet are the two factors which most affect a company's current environment. Opening up to the World, forced all participants of market processes to search for new tools to facilitate efficient operations on the international arena, boosting their flexibility and adaptability. The processes of the internationalisation of a company manifests itself in the expansion of operations in foreign markets, which means the far-flung branches of a company need to cooperate with each other and be constantly monitored, in 3 areas particularly: purchasing, sales and cost management. Unfortunately, some of the above mentioned areas are still not recognised as ones where using the internet and IT technologies could contribute to facilitating business processes.

This is particularly the case in the purchasing process, especially negotiation, which is IT innovation resistant. The main reason for this is the unwillingness to introduce change due to a lack of experience in the utilisation of new IT technology and an incapability to see the big picture of the negotiation process, which should consider, apart from sociological and psychological analyses, analysis of the effectiveness of a variety of solutions and the final selection of business partners. One obviously cannot exclude the influence here of deeply-rooted attitudes and a stereotypical perception of negotiations through direct communication – 'face-to-face'. It is generally believed that only this form allows the exchange of verbalised thoughts, ideas, knowledge and information as well

as enabling the message 'beyond words' in the form of non-verbal signals. Therefore, managers are reluctant to use tools unfamiliar to them and are not fully aware of their practicable applicability. One may here risk the statement that these are the main reasons for modern interactive communication models [Drzazga, 2006] or electronic transactional systems not being applied despite their value being indisputable, as these innovations ensure not only instant feedback and rapid information exchange between partners in real time, across geographical, political and social borders (which speeds up the decision making process) but also boost the effectiveness of the purchasing and negotiation process.

The internet as an indicator of new business conduct

Using the internet in order to search for market information on supply and sales sources, market gaps, identify the needs and expectations of a range of market segments, effective ways of influencing purchasing decisions, etc., are the sine qua non conditions in the current economic climate. The introduction of modern IT technologies actually broadens a company's operational borders and allows closer ties between companies in real time without middle men, which results in a significant reduction of costs and an increase in customer satisfaction [McKenna, 1997]. The continued blurring of the traditional hierarchal structure of operations (companies participate in various communities for the benefit of mutual ventures and initiatives), enables cooperation based on negotiation. The widening of negotiation options is accompanied by the simplification of transactions with clients. Furthermore, fast access to information and its exchange gives a new dimension to the relationship between companies, enhancing knowledge on distribution processes, needs and servicing of customers [Callation, Nemeč, 1999]. It also adds a new aspect to standards of managerial conduct [Lewicki, et. al., 2012] in reference to clients, despite the belief from the early 1990s that the new IT technologies would not significantly impact the work of management [Gregor, Stawiszyński, 2002].

New IT and communication technologies enable mass individualisation of offers, which can undoubtedly be regarded as another factor affecting managerial decision processes. The ease with which one may now ask a particular person for his/her preferences allows not only the adjustment of the offer but to a greater degree gain a partner's trust, and perhaps loyalty. The possibility of creating a new database which registers individual actions, becomes the foundation for customised offers. The ability to gain a wide range of information, particularly about business partners, allows

the creation of negotiation infrastructure [Ertel, 2005], defined as a kind of 'database' supporting managers while negotiating with clients. The internet is also particularly useful as a source of information which can be regarded as a significant advantage, particularly at the pre-negotiation stage. More and more often a company's internet site includes information on company operations, its missions, management and contracts, thereby becoming a tool for verifying a partner's trustworthiness. Moreover, sharing knowledge with other participants of the negotiation process shortens the time required for the pre-negotiation stage³¹ and final decision making.

The introduction of new IT and communication solutions allows the establishment of cooperation with a significantly higher number of partners than previously, however it also poses a number of risks. Foremost among these is the contribution to an increase in the uncertainty around transactions and a partner's behaviour. The ease of finding a new, preferable offer results in decreased stability between companies. New technologies create an opportunity to cooperate with a large number of partners and opens up new possibilities for those meeting the expectations of being a sound partner, though they do not eliminate the risk coming from having insufficient knowledge of a partner's behaviour while negotiating. The lack of personal contact between negotiating parties (excluding video conferencing) limits the opportunity to apply the full art of negotiation and eliminates the ability to 'hear' non-verbal messages coming from body language for instance. The possibility to affect the course of the conversation through the choice of negotiation time or venue is also curbed. The risk of the occurrence of false interpretation in complex and multi-faceted cases also increases. The significance of developing a personalised relationships also falls, which may lead to them being of a shorter nature.

Application areas for new IT technologies that support negotiation processes and purchasing decisions

The tools which facilitate the work of managers and marketers at the pre-negotiation stage, as well as further on at the final purchasing decision making stage, include computer models of negotiation support, NSS – Negotiation Support System, whose aim is to conduct negotiation analysis [Biesaga-Słomczewska, 2009]. These models have become the base for the

³¹ Extensive work by: G. Probst, S. Raub, K. Romhard, *Zarządzanie wiedzą w organizacji*, Oficyna Ekonomiczna, Kraków 2002; J. Pfeffer, R.I. Sutton, *Wiedza a działanie*, Oficyna Ekonomiczna, Kraków, 2002.

creation of electronic negotiation systems, ENS – e-Negotiation System, among which the most common include:³²

- *GroupSystems supporting traditional ‘face-to-face’ negotiation.* This system most frequently plays the role of a so called ‘analytic drive’ and is applied in order to process information referring to the very process itself and its participating parties. It supports construction of offers, their comparison and, should the need arrive, a search for a compromise as a solution.
- *The Additive Scoring System (ASS)* supports structuring of a negotiation, determining its main aims, the criteria of offer assessment and options for offer selection through consideration of qualitative and quantitative results. The created description of a negotiation situation enables the drawing up of a negotiation scenario and the identification of a negotiator’s preferences, including the best alternative for negotiation consensus. Unfortunately, the system has a flaw, which is the arbitrary assigning of abstract values of assessment to situations occurring in real time, hampering the interpretation of results and stirring up doubt stemming from applying a points’ scale which gives unclear values for instance [Wachowicz, 2007].
- *Analytic Hierarchical Process (AHP)* is applied in a situation with multiple goals. The advantage of this system is the application of a verbal scale referring to the significance of the negotiation issues without ascribing to them any abstract marking scale. The drawback is the application of the principle of ‘pair comparison’ while assessing the issues and, on this basis, coming up with the hierarchy of best solutions.
- *System INSPIRE*, aims to make the information on negotiation processes, analytical methods and graphic techniques of data visualisation widely available, as well as ensuring communication between negotiators within a computer system group. INSPIRE

³² An in-depth description of the procedure of the computer modelling system for negotiations support can be found in: T. Wachowicz, *Negotiation and Arbitration Support with Analytic Hierarchical Process* [w:] T. Trzaskalik (red.), *Multiple Criteria Decision Making*, AE, Katowice 2007; T. Wachowicz, *E-negocjacje. Modelowanie, analiza i wspomaganie*, AE, Katowice 2006; T. Wachowicz, *Model wspomagania mediatora w negocjacjach dwustronnych, cz. I, Badania operacyjne i decyzyjne*, no 3-4, 2004

is the first training system. The negotiations are conducted in three stages using the system.

At the first, pre-negotiation, stage the assessment of the negotiation topic is conducted, the possible packets are analysed, a maximum and minimum aim is determined, own BATNA and supposed partners BATNA are set and conduct strategy is determined.

The second, negotiation, stage includes the exchange of offers and communication between parties according to (Graph 1) a simplified chain of events. The example³³ below depicts merely the initial fragment of the commencement of negotiations.

Let us assume that company 'C' (Cypress) reports the need to buy parts for their machinery product. Without formulating an offer, it just sends a message inviting potential suppliers for negotiations. Company 'I' (Itex), interested in cooperating, sends the offer most beneficial for itself, in the form of a packet which includes the negotiable constituents (e.g. price, payment terms, delivery dates and return of faulty components). Obviously, the company starts with a high though realistic offer, which is accompanied by a message (a note including justification, requests for clarification or suggested options). In the reply to the proposal, company 'I' receives a follow up response from company 'C' along with an appropriate message, a further option and its rating.

³³ The example of Inspire application in negotiating process between two companies along with the description and the analysis was included in <http://invite.concordia.ca/inspire/demo.html>, accessed on: 30.12.2013.

Proposed offer

Rating of offer

Message

Your counterpart's offer 1: Tue. 17 Mar 1998 19:37:19 GMT

Price	3.47 \$	Thanks for your offer. I agree with you in the time of delivery, 20 days benefits we both. The other conditions are really high for my company and we can not accept them.
Delivery	20 days	
Payment	60 days after delivery	
Returns	Full price	
		Your rating 15

(3)

Cypress' reply

Your offer 1: Tue. 17 Mar 1998 02:19:58 GMT

Price	4.37 \$	Hope you think it's reasonably . It definitely benefits my company !! Bettina
Delivery	20 days	
Payment	Upon delivery	
Returns	75% refund with 10% spoilage	
Your rating : 100		

(2)

First Intex offer

Your counterpart's message 1: Tue. 10 Mar 1998 22:12:20 GMT

Dear Bettina: My company is interested in receiving offer from suppliers for our new product. I would be grateful you to send me an offers to provide real wheel gear assemblies to my company. I look forward hearing from you.

(1)

Cypress' message inviting negotiation

Graph 1. Record of exchange of offers conducted using Inspire system

Source: T.Wachowicz, *E-negocjacje. Modelowanie, analiza i wspomaganie.*[w] *Informatyka w badaniach operacyjnych* (ed.) T.Trzaskalik, Wydawnictwo Akademii Ekonomicznej w Katowicach, Katowice 2006, p.88.

At the stage of describing a negotiation issue, the system's users have already received overall guidance regarding the most attractive options for them (namely an 'offer rating' indicated by the system, based on the

previously assumed weights for the 'players' for each option), this 'rating' is verified each time negotiating packets change. The system allows the opportunity to follow any movement (viewing a process graph), thanks to which, one can constantly assess the scale of both parties' concessions [Wachowicz, 2007].

The third, post- negotiation, stage includes analysis of whether the settlement achieved by both parties was optimal. The Inspire system compares the packages, presents its critical assessment, highlighting both parties' best options (Graph 2.).

E-Sourcing is currently one of the most popular and innovative systems supporting the pre-negotiation process and its effective conduct. Constructed on an electronic platform, it enables global communication with suppliers of goods and services that have been invited to bid for potential cooperation projects. Each seller, having received their code and access password, may send an offer, participate in a tender, update their offer data, add attachments or pull out of a tender at any stage. The system facilitates offer correction, instantly visible to the purchaser, which is its main benefit. The purchaser draws up the criteria which determine his offer request, he has the option to conceal or reveal certain information important for the supplier, however, the fact that the system secures distribution, via the internet, of identical documents and information to each supplier simultaneously (unlike their distribution via traditional means) makes it innovative with regard to the tools utilised previously, due to the offer's homogeneity and clarity for all interested parties. This ensures fair competition according to the principles of purchasing ethics³⁴. The system is valued for its data archives and tracking a particular request as well as analysing the replies received from suppliers, which facilitate the selection of the best supplier in its class who is able to meet a client's expectations and ensure comprehensive cooperation with them. Apart from the above, other benefits of the system include the collection of a number of diverse offers, grouped according to criteria, which allows the selection of the most optimal solution concerning both a product's standard and price.

³⁴ Por. E.J.Biesaga-Słomczewska, K.Iwińska-Knop, *Internet jako narzędzie doskonalenia jakości procesu negocjacyjnego*, *Zeszyty Naukowe Ekonomiczne problemy Usług*, no 703, Szczecin, 2012, pp. 24–33.

Post – settlement analysis

Improve the achieved compromise

You and your counterpart have jointly accepted the following package

Price	3.98 \$
Delivery	30 days
Payment	30 days after delivery
Returns	Full price
Your rating	50

The
Compro
mise
achieved

As mentioned earlier, this compromise is binding in the sense that it will continue to apply regardless of any future actions you and your counterpart may take, unless both of you *jointly* reach another compromise.

INSPIRE has reviewed the preferences information provided by you (and your counterpart) and determined that each of the following packages is better than your current compromise for at least one of you, while leaving neither of you worse off (There may be more such packages, only the maximum of five, covering the whole range, are shown). The value of each package to you is also printed as a score under the package:

Price	3.71 \$	Price	3.71 \$	Better solutions selected by Inspire
Delivery	30 days	Delivery	60 days	
Payment	60 days after delivery	Payment	60 days after delivery	
Returns	75% refund with 10% spoilage	Returns	75% refund with 10% spoilage	
Your rating	90	Your rating	60	

Graph 2. Post- negotiation analysis conducted using the Inspire system

Source: T.Wachowicz, *E-negocjacje. Modelowanie, analiza i wspomaganie.*[w] *Informatyka w badaniach operacyjnych* (ed.) T.Trzaskalik, Wydawnictwo Akademii Ekonomicznej, Katowice 2006, p. 90.

The presented systems of negotiation support cover just a fraction of a manager's and marketer's purchasing process activity. Among a number of solutions, the most valuable are those which are constructed on an electronic platform, as it is those that make the business processes global. Such a system is E-Sourcing.

Ariba Networks – an innovative platform for networking business partners

Ariba Networks is one of the World's biggest such networks, supporting all stages of a company's business: from searching for and networking with partners³⁵, through e-supply and e-invoicing assistance to even working capital management. Due to its universality, it has attracted half a million large companies, including General Motors, Pfizer, MacDonald's, Siemens, BP and Unilever.

Ariba, established in 1996 in California [Jakovljevic, 2011], came up with the idea to create a platform that would enable companies to improve the effectiveness of procurement process management. The initial stage of platform operations was mostly focused on employee effectiveness through simplification of their daily tasks, thanks to the application of supporting software (spreadsheets, text documents and electronic presentations). The following stage of innovation development concentrated on boosting productivity in the area of cooperation between particular company departments, which initiated Electronic Resource Planning (ERP), namely advanced resource management [Fertsch, 2006]. In other words, ERP is an IT system class which facilitates company management or cooperation of a group of companies which collaborate in order to store data and through them conduct operations [Fertsch, 2006].

This company's first product innovation was Ariba Buyer system, released in 1997, followed 2 years later by a complete business-to-business system on the specifics of the marketplace with a supplier network³⁶. In its first version, the system operated under the name Ariba Supplier Network which was later changed to Ariba Network. In the same year, the company made its appearance on the stock market and resources gained through this

³⁵ Source: <http://www.ariba.com/solutions/sell/supplier-membership-program/faq/pl>, [accessed on: 29.09.2013].

³⁶ <http://www.siliconvalleyhistorical.org/#!ariba-company-history/c1q8b>, [accessed on: 29.09.2013].

were devoted to software development and the establishment of strategic alliances with on-line payment and logistic support services, which, as a consequence, contributed to the creation of the largest community of buyers and sellers on the internet. In light of the fact that there was a constant rise in proposals for large scale purchases, a new product innovation arose – Ariba Sourcing system, which enabled the use of purchasing strategies in all categories of production expenditure as well as the previously mentioned facilitation of negotiation and in practice meant comprehensive support of a company's purchasing processes.

To meet customer expectations, in 2006 Ariba³⁷ launched a further product and organisational innovation, changing their model of service provision into Software as a Service, which provided software for storing applications on their own servers without the necessity for clients to install it. This function significantly boosted the company's competitiveness on the market, however it also entailed a new cost for the company stemming from the necessity of ensuring constant access to the service.

Overall, Ariba Networks supports business processes in the following three areas:³⁸

Purchasing – systems that look into a company's expenditure and their sources, monitoring transactions with external parties (e.g. through creating a list of potential suppliers, thereby reducing costs and trading risks). At the stage of supplier selection, a buyer can use Ariba Sourcing Solutions, which is particularly useful when creating purchasing strategies, especially during negotiations. It also enables selection and monitoring of suppliers [Jakovljevic, 2011]. Another advantage is the constant monitoring of cooperation with suppliers and its comparison according to the key indices selected, which could optimise future partner selection. The most extensive system of purchase support is Ariba Procurement and Expense Solution [Jakovljevic, 2011]. This allows the monitoring of the purchasing process from the moment of requirement through order placement to chosen supplier, delivery monitoring, up to invoicing and payment. Ariba Supplier Management Solution [Jakovljevic, 2011] is a particularly useful supporting system in the management of the purchasing process. Its unique applicability comes from the possibility to identify new supply sources and evaluation and assessment of cooperation risk with individual suppliers.

³⁷ In 2012 Ariba was sold to a German company SAP compare. http://dealbook.nytimes.com/2012/05/22/sap-agrees-to-acquire-ariba-for-4-5-billion/?_r=0, accessed on: 01.10.2013.

³⁸ Source: <http://www.ariba.com/solutions>, accessed on: 03.10.2013.

The presented purchasing support systems available on electronic platforms obviously do not exhaust the list of all possible solutions in this area, which is particularly noticeable in the large, multinational corporations that compete in launching innovations in the field of electronic transactional solutions. They enable companies to ensure not only the cohesiveness of the reporting and monitoring system but also effective purchasing process management in all branches, independent of their location, as well as the application of one homogeneous procurement strategy, which ensures maximisation of effect through careful selection of supplier base and the ensuring of full control over transactions conducted. Moreover, the users of Ariba Network's purchasing systems may avail of e-auctions, an electronic form of product price negotiation. This utilises reverse auctions, namely when a buyer expresses his or her willingness to purchase a product and during the auction the sellers outbid each other offering increasingly lower prices for its supply.

Sales – software supporting internet sales (e.g. through facilitating the search for a particular supplier and simplification of the purchase process in their virtual shop).

Payment management – the possibility of replacing traditional payment systems with electronic ones. Ariba Spend Analysis Solution [Jakovljevic, 2011] is software which supports expenditure analysis. It enables users to follow the costs generated by particular types of purchases, thus facilitating cost monitoring within a company. Extra software modification (Ariba Data Enrichment) enables the forecasting of expenditure, which, as a consequence, facilitates financial management within a company.

Ariba Contract Management Solution is the system supporting the above three areas and the monitoring of the total contract cycle from contract requirement and its acceptance, through the whole preparatory process, negotiations of terms and conditions, up to the moment of signing with authorised electronic signatures. Apart from its overseeing process aspect, the system additionally controls contract continuity, thanks to reminding users of upcoming contract end dates and the necessity for renegotiation.

Implementation of electronic technologies in the area of procurement – benefits and drawbacks

The benefits of electronic procurement implementation are indisputable, which is proven by the research conducted in ten multi-national organisations including Hewlett Packard, Rolls-Royce, GlaxoSmithKline

and Skanska in the report of the consulting company AberdeenGroup [2005]³⁹.

The greatest advantage highlighted by these Boston specialists is the reduction of company operational costs, which stems from a reduction in transactional costs and the possibility to negotiate improved contractual terms thanks to access to a wider range of suppliers. Controlling administrative expenses is also significant through the increase in process effectiveness as a result of the reduction in traditional communication via telephone or fax to a partly automated electronic one as well as giving up paper documents and their storage in archives. Thanks to procurement process standardisation, employee productivity rises when it comes to cooperation between a company's departments (finance, logistics, storage and quality control) engaged in procurement. Paradoxically however, introduction of e-procurement⁴⁰ may contribute to an increase in expenditure on procurement process management. The rise in efficiency of individual employees (servicing a higher number of transactions) may cause an increase in the cost of their management. Despite this, the benefits are regarded as significant. In companies applying virtual procurement support systems every extra dollar spent in this area generated from 5-20% return on procurement expenditure.

Apart from the advantages achieved there are also reported cases of dissatisfied system users but they are mainly the result of incorrect application which unfortunately triggers losses and poses risks. The usage of software requires adequate employee training, true for both buyer and seller. In order to make the implementation of the system effective one should observe the suppliers already on the virtual market in a chosen sector as well as determining the possibilities for new companies to enter this market. Small companies find it extremely difficult to stay on the internet transactional platforms due to their limited scale of operation. Therefore, large companies must consider the risk of dead markets (of little activity) when establishing cooperation with smaller suppliers and the possible loss of forecasted benefits of innovative procurement solution implementation.

Companies willing to implement procurement management systems must also take into account the fact that their current suppliers may not have the required technology at their disposal or show resistance towards

³⁹ *Best Practices In E-Procurement, Reducing Costs and Increasing Value through Online Buying*, AberdeenGroup, Boston 2005, pp. 4–8.

⁴⁰ e-procurement refers to e-business [e-biznesu](#) that deals with electronic integration and management of all electronic ordering and supply departments in both public [sektorze publicznym](#) and private sectors [sektorze prywatny](#).

its introduction due to the necessity of incurring extra expense (cost, service training, etc.). There are two solutions to this problem: supporting of the supplier during the transition to the new system, which is seen as a burden, or two fold running of the procurement process, meaning maintaining the traditional means of cooperation with current partners while searching for new ones that operate on the virtual network. Each scenario entails further costs and delays planned benefits from the implementation of the new system. As the quoted report says, over a half of the companies implementing electronic systems faced the problem of approval of the budget and support from higher management who have the tools to mitigate the resistance of various employee groups anxious about the consequences of changes to the procurement process.

The introduction of Ariba solutions in Hewlett-Packard (HP)⁴¹ may serve as an example of the extensive implementation of an electronic procurement system. HP is one of the World leaders of modern technologies, including production of electronic devices, software and outsourcing service provision. It has a work force of over 330,000 and has an annual turnover exceeding 110 billion dollars. The main principle guiding the introduction of the procurement system was the finding of significant savings thanks to the decrease in the number of non-production goods suppliers and an increase in expense monitoring. HP opted for the implementation of a comprehensive system when Ariba was at its initial stage in the e-procurement market. At present, Hewlett-Packard applies purchasing and invoicing modules for non-production procurement. 95% of this operation is conducted through these modules. All purchasing categories (production, non-production and purchasing of services) apply the tools which facilitate cost analysis and supplier management. Thanks to the implementation of expenditure management strategies, the creation of a strategic supplier base and the introduction of e-procurement platform standards the company's operational expenditure dropped in 2005 to the level of 0.75% of total company expenditure, compared to 0.95% in 2002. The scrapping of over 100 locally developed systems for just one generated an annual saving of over 7 million dollars. Additionally, the application of this system allowed the company to evaluate suppliers and continue cooperation only with the highest quality service providers. Ariba systems facilitated the automation of the processes, focussing employee attention on strategic aspects when making purchases.

⁴¹ *Best Practices In E-Procurement, Reducing Costs and Increasing Value through Online Buying*, AberdeenGroup, Boston 2005, pp. 18–20.

The success of the Ariba system application consists of a number of factors, including not only support provided by the management and its engagement in the introduction process but also ensuring the user-friendliness of the system. This fact contributed to the reduction of the occurrence of errors stemming from the application's users natural tendency towards software personalisation. The company does its best to structuralise the process, every improvement suggestion proposed by an employee must therefore be evaluated. Only the best solutions are adopted, which enables the avoidance of unnecessary change and saves the costs connected to platform development. Another constituent of HP's success in the implementation of the system is also the long term planning of its implementation, in particular, gradual integration with the existing software used in the company.

Summary

The presented innovative IT solutions which are currently commonly introduced in procurement processes and the accompanying negotiations clearly sets the direction of a new era in business conduct. The coming years will undoubtedly surprise us with new solutions in the area of automation and computerisation of most processes taking place within a company, independent of their sector or country of origin. The direction of the current procurement systems point to continual improvements in the process and its development. However, the human factor seems to be crucial in all cases. Without sufficient expenditure on training and awareness-raising it will be hard to implement even the best systems and accompanying solutions. Negotiations are more vulnerable in this respect as their conduct will always rely on the person. The existing negotiating process support models or their accompanying systems will not replace the human mind. It is impossible to work exclusively using e-auction and similar tools as one cannot describe some product features in such detail for them to become quantifiable. It will be hard to make smaller market players implement expensive systems. There will always be multi-level negotiations: e-negotiations regarding price and traditional negotiations which include the full qualitative aspect of product features as well as an emotional one which, in the final stages, translates into building better relationships between partners. Electronic procurement and negotiation systems will perform their supportive role. Companies implementing online solutions need to be aware of both their benefits and drawbacks and be able to justify the validity of such operations.

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