MALL2000 – A document-based platform for negotiations in electronic commerce

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1 Introduction

Within the last few years, the annual amount of trading in the business-to consumer area of electronic commerce (EC) grew remarkably, and the amount in the business-to-business area grew even more.

In the business-to-consumer area, there exists a clear division of roles from customer and supplier. Usually, the customer's influence on the line of trade is limited to the decision to buy or not to buy. The supplier gives the assortment of goods and a set of delivery and payment options from which the customer may choose.

Due to the customer's restricted possibilities to influence the choice of available goods, the business-to-consumer electronic trading is mainly suitable to replace the means of communications for the ordering of goods (chosen from some kind of catalog) from letter/fax or phone to Internet.

In order to enlarge the area of EC, additional capabilities have to be added into the business-to-business area. For example, the communication among business people has to be supported, going beyond the exchange of addresses and ordering information, which is the actual state.

In this sense, the difference between business-to-business and business-to-consumer EC does not lie in the partners but in their relationship and the way their trading is assisted.

This paper introduces MALL2000, a platform for negotiations in EC among business people from small and medium-sized enterprises (SMEs). In the following section, the conception of document-based negotiations will be introduced. Section 3 describes the electronic marketplace MALL2000 and details of the project. Finally, the substance of this paper will be concluded.

2 Document-based negotiations

We stated in the introduction of this paper, that EC based on filling forms restricts the application fields of EC to those already known from more "traditional" commerce via fax or letter. But as computers provide another dimension of functionality than fax machines, EC can open up new spheres of trading. This refers especially to small and medium-sized enterprises (SMEs) which are the focus group of the MALL2000 project.

The aim is to emphazise those areas, in which SMEs are typically in advantage compared to their competitors with large capacity, and to adapt and carry them forward to EC. If on the occasion of the firm's anniversary, the head of an enterprise wants to offer a cream gateau resembling the logo of the enterprise, the head person would usually consult the cake shop nearby, not try to look it up in the catalog of the caterer who daily supplies huge amounts of pastry to the company canteen.

But it often gives a lot of trouble to find and contact a small-scale manufacturer instead of a large-scale producer, and to agree upon all details with him. This communication is usually done personally or by phone (the first restricts the potential partners to those nearby, the second to those speaking the same language), or by letter (which is time-consuming). Fax is an alternative, but it also does not enable a good transmission of pictures.

So what is needed is the possibility to find potential partners and to interact with them in a peer-to-peer structure, without restrictions given by forms, but goal-directed towards the conclusion of a contract. MALL2000 meets these requirements by providing documents (MALLdocs), which consist of hierarchically structurable parts (DOCparts). Available parts are, for example, texts, pictures, spreadsheets for planning and simulation, business graphic presentations, and database access forms. The participants can attach active behaviour or to-do information to any part or combination of parts, so that the course of business is treated as a workflow process.

A sketch of a working scenario using a MALLdoc by a group of cooperating businesspeople should illustrate the document-centred, business-to-business environment of MALL2000. We use the scenario as our running example for introducing what we call HotFlow in the HotDoc framework (Buchner 1998) with details of its architecture.

A business enterprise wants to buy a company car for a physically handicapped employee. The car will have common extras (e.g., air-conditioning) as well as uncommon extras (e.g., special replacements for the pedals).

This scenario describes a successful negotiation which leads to the conclusion of a contract. It serves as an example for documents as a basis for negotiations.

Mechanisms for breaking off a negotiation or transaction at miscellaneous points including the respective possibly resulting obligations must be provided as well. Additional services like translation support, information on export restrictions, taxes etc. are available at any time.

A MALL2000 correspondent can get in touch with potential partners by querying the MALL2000 database or by posting a note on the MALL2000 bulletin board. When a contact is established, a negotiation document is created on the MALL2000 server – one document for each contact, if necessary.

Multiple partners can be involved in one negotiation document. In our example these might be:

– the manufacturer for the special replacements of the pedals,

– the motor-car dealer who installs the special replace-ments of the pedals,

– the purchasing department of the enterprise which wants to buy the car, and

– the handicapped employee.

As in most countries modifications on cars must be certified, the partners might decide to give access rights to the respective safety standards authority (MOT, TÜV, ...) or to integrate the certification into the workflow of the negotiation procedure.

All involved partners read and write DOCparts of the negotiation document. Each DOCpart has its own access restrictions – the purchasing details might be of no interest for the safety standards authority, whereas the technical details have to be readable and the certification of the technical modifications must be write-protected for the negotiating partners. They specify demands, prices, terms of delivery etc. until they come to the point of entering into a contract.

A MALLdoc can consist of several hierarchically structured DOCparts, depending on the preferences of the partners and the branching of the actually discussed alternatives. In our example there might be one DOCpart for each car model. The subparts might consist of a picture, the choice of the common extras, the price and a description of the special replacements which would be possible or necessary in the respective car model.

Subparts can have some functionality, e.g., if one special car model is available for no longer but a short period, the potential buyer has to decide within a certain time limit. If he doesn't react (due to illness, having forgotten it or whatever), the subpart remembers the partner automatically (e.g., by e-mail).

When the partners decide in favour of one model with certain common or uncommon extras, the subparts for all other alternatives are closed.

The contract is built up by all partners on the basis of the DOCpart of the negotiation document with the description of the favoured alternative. In this subpart much of the contract-relevant information is already available. Court of jurisdiction and other necessary details have to be added. MALL2000 offers draft agreements which can be modified. Articles of the contract can be filled in those agreements, but the partners can start with just a selection of them or even a blank sheet as well.

As the documents are stored on the MALL2000 server, MALL2000 is the guarantor for fair trade and distributes copies of the contract (in translated versions, if requested) to all involved partners.

The execution of the agreements of the contract (delivery of the car, modalities of payment etc.) might be guarded by further active DOCparts of the document if the partners request it.

3 MALL2000 – An electronic marketplace

The MALL2000 approach emphasizes the negotiation phase of a business process. The negotiation part is integrated into the typical infrastructure of electronic malls with services for translation, training, business support and others.

When subscribing to MALL2000, each client states her branch of business and more detailed, in which of the predefined sectors she generally supplies and in which she demands. A rough description of the firm is included, too.

If one subscriber has a request like the one described above, she queries the MALL2000 database with the predefined sector or consults the bulletin board. After obtaining the results, she can read the description of the enterprises in question. For each enterprise she wants to contact in order to adjust her needs and the supplier's capabilities, one seperate MALLdoc is generated, so that the potential rivals in business do not have any information of the competition.

It is possible to freely negotiate about whatever kind of goods. In order to achieve the goal instead of getting lost in communication, the trade procedure is outlined as an adaptive business process. This is visually supported by HotFlow, the tool for dynamic workflow definition, control and execution in MALL2000, based on drag-and-drop actions with workflow items and connectors or using (and adapting) predefined business process patterns.

The MALL2000 project started in autumn 1998. A prototype of the negotiation part is available in summer 1999, an overall prototype by end of 1999.

4 Conclusions

The document-centred approach of MALL2000 allows to integrate controlled, dynamic workflow processing with business-to-business EC.

This approach goes far beyond the "customer orders, supplier delivers" line of trade, which is usually based on filling standard forms with predefined fields. It enables business people to establish business contacts as well as to conduct a single business or do a large-scale trading. Extensive transactions can be handled, requiring the agreement on many fundamental details, varying from one case to another.

5 References

Buchner, J. (1998). HotDoc – Ein flexibles System für den kooperativen Aufbau zusammengesetzter Dokumentstrukturen. Doctoral dissertation, Darmstadt University of Technology, Germany.

Cellary, W., Picard, W. & Wieczerzycki, W. (1998). Web-Based Business-to-Business Negotiation Support. In Griffel, F., Tu, T., Lamersdorf, W. (Eds.): *Electronic Commerce* (International IFIP/GI Working Conference on Trends in Distributed Systems for Electronic Commerce, TrEC'98, Hamburg, Germany), pp.80-89. Heidelberg, Germany: dpunkt.verlag.

Hoffmann, H.-J. (1998). MALL2000+, A vision for a virtual marketplace for businessmen. In Roger, J.-Y., Stanford-Smith, B. & Kidd, P. T. (Eds.): *Advances in Information Technologies: The Business Challenge*, pp. 247-254. Amsterdam, Berlin, Oxford, Tokyo, Washington DC: IOS Press.

Hoffmann, H.-J. & Handl, D. (1999). Document exchange as a basis for business-to-business co-operation. Accepted as a conference paper for EMMSEC'99, June 1999, Stockholm (Sweden).

MALL2000 consortium, http://www-it.fmi.uni-sofia.bg/mall2000/home.html, 1999, and http://www.pu.informatik.tu-darmstadt.de/Projekte/Mall2000, 1999.

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All opinions expressed are those of the authors.