



Modeling of B2B mobile commerce processes

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Abstract

Wireless network technologies, e.g. Bluetooth, enable the direct data exchange between mobile devices. When used in business-to-business processes, a new form of inter-organizational application integration becomes possible, which occurs ad hoc in mobile contexts, contrary to the presently dominating approaches, e.g. such as EDI, which connects centralized servers. Possible applications of this “ad hoc application integration” include fully digitized sales processes of goods, where all business documents are exchanged electronically at the point-of-sales via wireless data transmission technologies. This paper presents the technical aspects of ad hoc application integration and a notation for modeling and identifying ad hoc integration scenarios.

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1. Introduction

Wireless networks and the miniaturization of mobile devices (e.g. PDAs) now enable new application scenarios of (standard-) business applications in mobile contexts, referred as “mobile applications” in the following. While conventional integrated business applications were mainly used in-house via stationary PCs, mobile applications allow to enter and use data at arbitrary places on different mobile devices. Key aspired advantages are the direct entry

and availability of relevant data and a mobile device in a mobile context (e.g. no manual re-entry of data) and as a consequence, quick and smooth digital information flow across the whole enterprise. Early well-known adopters of mobile applications are the logistic providers, such as DHL or FedEx, whose truck drivers use handheld devices as part of their delivery service. The handheld devices replaced previously used paper forms. Their use allow to electronically track delivery of the parcels almost in realtime. Further domains are now exploiting the benefits of mobile applications; examples include the deployment of PDA applications for the sales and service staff at Pepsi in the US (e.g. Brewin, 2002). “Mobile Commerce” in this context is the use of

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mobile applications by users at the organizational interface to the customer.

Taking the aspired advantages of mobile applications and integrated applications one step further, new application scenarios will also arise for inter-organizational data exchange: It is very likely that in the near term future standard mobile business processes in a company will be supported by business applications running on an appropriate electronic device (PDA, laptop, etc.). Non-electronic communication measures in these processes (e.g. paper forms) will be reduced to a minimum for efficiency reasons. Of special interest in this regard are process tasks, which require an interaction with other organizations (customers, suppliers, etc.): If both involved parties are using a (mobile) business application to accomplish their tasks, it is reasonable to assume, that both of them work at least partly with the same information in their applications. A typical example for such an information relevant to both parties is an invoice, which is required by the customer and the supplier. Accordingly the exchange of this common information via electronic measures opens up the opportunity to harvest all benefits of integration, such as avoiding re-entry of data and quick availability of the information. This paper shows, that the use of ad hoc network technologies is a suitable infrastructure to accomplish this. This offers new possibilities of application integration for business-to-business (B2B) commerce. In contrast to conventional application integration, such application integration occurs “ad hoc”, i.e. at a not previously defined moment and place. A simple example scenario for ad hoc integration is the planning of a follow-up appointment among several meeting participants through the ad-hoc sharing of personal electronic calendars. An example scenario from the B2B sales domain is presented in Section 3.

Obvious use cases for ad hoc integration scenarios are the processes and business documents already discussed in the context of electronic data interchange (EDI) initiatives (e.g. [Krcmar, 1995](#)). In contrast to conventional EDI-based integration and currently discussed electronic market places, these could take place via means of decentralized technical interfaces on mobile

devices. This is particularly relevant because despite all e-commerce potentials, industrial marketing consistently accentuates individual communication for a trustworthy cooperation (e.g. [Leek et al., 2003](#)). This especially holds true for the strongly expanding service industry, which depends on direct personal interactions.

Taking all of this into account, issues of identifying potential usages of mobile applications and ad hoc application integration are of interest.

This article presents a notation for business process modeling of B2B mobile commerce processes. First, technical aspects of ad hoc application integration using wireless network technologies are presented, by means of a basic ad hoc integration scenario. Building on this basic scenario the notation is presented. The article ends with an outlook and open issues.

2. Ad hoc application integration

2.1. Inter-organizational application integration

Industry requirements for IT-support of existing and new inter-organizational processes led to a constantly increasing demand for integrated application systems. Application integration has been known as complex and risky. E.g. the minimization of technical risks through interface minimization was identified as a critical success factor for the implementation of standard software (e.g. [Parr and Shanks, 2000](#)). The demand for application integration has led to the development of a new type of standard software, so-called “enterprise application integration” (EAI) systems (e.g. [Lee et al., 2003](#)).

In-house integration problems can be reduced by means of appropriate IT procurement strategies (e.g. use of an integrated solution exclusively from one vendor) and central EAI tools. The trend to integrate inter-organizational business processes increases the demand for inter EAI solutions. The mainsprings for this are e-commerce processes, particularly with the implementation of optimized procurement strategies within supply chain management (SCM) strategies. According to [Scheer and Borowsky \(1999\)](#), SCM is characterized by

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