Business-to-Business Integration Technology

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Abstract. Business-to-Business (B2B) integration technology refers to software systems that enable the communication of electronic business events between organizations across computer networks like the Internet or specialized networks like SWIFT [19]. A typical example of business events is a *create purchase order* sent from a buyer to a seller with the intent that the seller delivers the ordered products eventually, or a *post invoice* sent from a supplier to a buyer with the intent that the buyer fulfills his obligation to pay for delivered products. Business events carry business data as such and the sender's intent about what it expects the receiver to do. As business events are mission critical for the success of private, public, and government organizations, their reliable and dependable processing and transmission is paramount.

Database technology is a platform technology that has proven to be reliable and dependable for the management of large sets of dynamic data across a huge variety of applications. In recent years, functionality beyond data management was added to database technology making it a feasible platform for business event processing in addition to data processing itself. New functionality like complex data types, audit trails, message queuing, remote message transmission or publish/subscribe communication fulfills basic requirements for business event processing and are all relevant for B2B integration technology.

This contribution investigates the use of database technology for business event processing between organizations. First, a high-level conceptual model for B2B integration is introduced that derives basic business event processing requirements. A B2B integration system architecture outline is provided that defines the B2B integration system boundaries, before specific database functionality is discussed as implementation technology for business event processing. Some future trends as well as some proposals for extended database functionality is presented as a conclusion of this chapter.

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1 Business Events

The core concept of B2B integration is the business event. It is the main element of concern and all other concepts are subordinate to it. An organization that communicates with another organization has to define which business events are communicated and in which order they are sent by it or are expected to be received by it from the partner organization. The business event is therefore the main carrier of the communication semantics between organizations.

A B2B integration architecture is the system conception for executing business event communication between organizations over networks. It also has to connect to the organization internal business application systems. This is important, because business application systems manage the business data that are communicated through business events by the B2B integration technology.

This initial section introduces both, the concepts of B2B integration with business events as the main concept as well as a B2B integration architecture overview.

1.1 Concepts

The main concepts are introduced in this section in more detail. Based on these concepts the B2B integration architecture is introduced that will be the basis for discussion how database technology can implement its components. In [3], the conceptual model of B2B integration is described in a lot more detail and so is the corresponding B2B integration architecture.

Business Event. The main concept of B2B integration is the business event which has a name, an intent, and carries business data. For example, *create purchase order* is a name of a business event. That name by itself indicates the intent *create* and the business data that are carried by it *purchase order*. When defining a business event, it is mandatory that all necessary business data are included so that the recipient of the business event can fulfill the intent by executing an appropriate business function.

For example, in case of creating a purchase order the intent of the buyer is to receive certain goods by a certain time for a specific price and a given quality, amongst other properties. The supplier executes a business function that either determines that it can deliver the products as specified by the *create purchase order* event, that it can deliver the ordered products with different parameters from those defined (for example, the delivery will be later as requested), or it cannot deliver those at all. Whatever the outcome of the business function is, it returns an event *notify purchase order acknowledgement* that specifies the outcome of the business function for the buyer. The intent of this business event depends on the outcome. If the supplier can ship the products as ordered by the buyer, then this is a true notification. And the expectation is, that the products are going to be built and delivered as specified. If the outcome is that in principle the products can be delivered, however, with different parameters, then the buyer is expected to agree to this change or to disagree with it. If the outcome is that the supplier cannot de-