

Record Keeping for Digital Contracts

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INTRODUCTION

A challenge in electronic commerce is to keep proper records of business contracts made over the Internet. A common type of contract is a purchase order that a buyer places on a vendor using the Web or a private network. The government has to step in to adjudicate disputes if and when they arise. It is in the public's interest, therefore, that formal and indisputable methods are developed for recording contracts digitally.

On June 30, 2000, the Electronic Signatures in Global and National Commerce Act (E-sign Act) was passed in USA, and it legalized electronic signatures in contracts. This paved the way for the rapid growth in electronic commerce which is estimated to be \$3.2 trillion in the USA (Freeman, 2004). With this sizable business, it is very likely that disputes involving electronic contracts arise.

In this article, we suggest a few models and processes for creating and storing authentic contract documents so that future disputes can be settled more effectively.

BACKGROUND

Disputes could be about any aspect of a contract. They could be about the quantity, the price, or the quality of the product or service stated in the contract. In the former case, the dispute may concern the exact wording of a clause in the contract. If the contract is in digital format, then we have to make sure that the contract has not been altered by any of the parties. In a hard copy, alterations can be easily detected, but in a digital format, alterations can be difficult or impossible to detect. One way, almost an ideal way, to avoid alteration is to use digital signatures (Anthony, 2004; Freeman, 2004; Landau, 2000). A digitally signed electronic document cannot be altered or forged. The scheme will work as follows: The buyer sends a digitally signed purchase order, usually with an expiration date, to the seller which declares the buyer's offer to pay

for the goods or services mentioned in the order. When the seller accepts the order, the seller digitally signs and dates the order that is already signed by the buyer. The seller then sends a copy of the doubly signed document to the buyer. Now both parties have a doubly signed unalterable document and there can be no dispute about the content of the contract. This scheme is practicable when both parties are rich enough to possess public keys necessary for digital signatures. In practice, though, the buyers of consumer products such as personal computers may not have public keys and will not be able to sign documents digitally. Yet, they would like to be able to place purchase orders over the Web without fear of fraud. Also, the seller, usually a large corporation, should be able to accept as many orders as possible without fear of dispute.

Another case is a large buyer who purchases many types of products from many small suppliers. In this case too, a third party can keep the records of all contracts so as to minimize disputes.

In this article, we provide a few approaches to generate and store electronic contracts between a customer and the business. These approaches differ in the following aspects: average dollar worth of the sales transaction, likelihood of default or a lawsuit, and the technical infrastructure with which the business operates.

MAIN FOCUS OF THE ARTICLE

In this section, we present a few models in which a third party stores the contracts so as to minimize the chances for disputes. The third parties may be certified by some governmental authority, or an international authority, so that credibility of such an entity is established. To avoid the need for additional governmental expenses, existing trade authorities can be entrusted with this task of certifying third parties.

Single Seller, Multiple Buyers

In this scenario, a large seller receives orders from thousands of buyers digitally, say, through a secure Web page created for the purpose at the company's Web site. After the product is delivered against an order, it is possible that the buyer disagrees about some aspect of the order. To minimize such complaints, the seller hires a third party to receive and store the contracts. The steps involved in this scenario are:

1. The seller publicly announces products and prices, on its official Web site
2. A buyer places a purchase order which is received by the third party, rather than the seller
3. The third party sends the order to the seller and gets it digitally signed by the seller
4. The third party sends the digitally signed copy to the buyer
5. If the buyer accepts it, the buyer makes the payment, usually through a credit card authorization
6. The third party stores the digitally signed purchase order and the buyer's credit card authorization for a predetermined length of time, so it can be retrieved in case of dispute

Single Buyer, Multiple Sellers

A large buyer such as a manufacturing company may place purchase orders on hundreds of suppliers for thousands of materials. Suppliers could be in different countries. The buyer hires a third party to store the contracts in order to minimize disputes. The steps involved in this scenario are:

1. The buyer sends a digitally signed purchase order to the third party
2. The third party sends the digitally signed order to the seller
3. If the seller accepts the order, the seller sends an acceptance notice and a credit card authorization for payment to the third party
4. The third party stores the contract and the acceptance notice with credit card authorization for a predetermined length of time, so it can be retrieved in case of dispute

Call for Quotes

In this case, the buyer calls for quotes for a project from many potential contractors. Usually, a deadline for submitting quotes is specified, the quotes are sealed, and all quotes are opened at once at a predetermined time. Dis-

putes can still arise about some aspects of a quote. The buyer can hire a third party to receive and process the quotes so as to minimize the chances of disputes. The steps here are:

1. The buyer announces a Call for Quotes at an official Web site
2. Contractors send their password-protected quotes to the third party, and receive an acknowledgment of receipt. (A pdf file of the quote can be password protected reliably). Contractors who have public key facility may digitally sign their quotes for added security
3. Contractors communicate their passwords to the third party at a predetermined time, so that their quotes can be opened
4. The third party communicates all quotes to the buyer, and stores them for a predetermined length of time

Government-Hired Third Party

Sale of real estate and automotive vehicles are required to be registered with the government. For economic reasons, a government may hire a third party to store sales documents in a way that is amenable to public access, or protected access by authorized parties. The steps here are:

1. The buyer and seller both pay a fee and ask the third party for a document to be stored according to government specifications. Payment of fees is taken as acceptance of the document version
2. The third party stores the document for a predetermined length of time and provides public access to it via a Web site. If the document is to be protected in such a way that only those with a password can access it, the third party implements such protection

Independent Third Party Service

In this model, a document that involves two or more parties is stored by the third party for a fee. Payment of the fee is considered acceptance of the document version by all parties. The steps here are:

1. The third party announces its services via a Web site
2. Each of two or more parties pays a fee to the third party to store a document for a predetermined length of time with password protected access. One or more of these parties may digitally sign it for further security

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