THE THREE STAGES OF E-COMMERCE

Understanding the types of e-commerce available

In order to benefit from e-commerce organizations must first understand the types of e-commerce solutions and models available. Electronic Commerce is an established industry - far older than most businesses can imagine.
Electronic Commerce in the 21st Century

There are a number of ways to define the term “Electronic Commerce.” Today, most consumers think of electronic commerce as the use of a website to search and place an order or purchase a product. In fact, electronic commerce is significantly more involved and has been in practice for a number of years prior to the explosion of our current definition of e-commerce. As far back as 1994, the need was driven by work performed related to the electronic exchange of transaction documents for several large corporate entities (the most basic definition of electronic commerce), and the difficulties faced in performing tasks within this field.

One of the lessons from this work was that transactions can exist within separate business entities and between groups or divisions within the organization. This concept of ‘trading partners’ clearly shows that there are often many different trading patterns within and between organizations, and that there is no one solution that addresses both. Consider that within business-to-business markets, most businesses do the majority of their trading volume with a few loyal customers who have set trading patterns. Nevertheless, most businesses also have a lot of customers who trade with them in irregular patterns. This, of course, is a result of the inherent nature of the market and the position of different businesses within their market categories. There is very little if anything that individual businesses can do to change this fact. As a result, the electronic commerce solutions they implement should take this inherent nature of doing business into account. Electronic commerce solutions are implemented as a tool in order to reduce costs and increase efficiency.

![Business-to-Business Electronic Value Chain](image)

**Figure 1: The Business-to-Business Electronic Value Chain**
The business-to-business e-commerce value chain

The Internet has revolutionized electronic commerce and has provided a standard protocol for the exchange of information, thus giving companies a window into a worldwide market for their products. Though electronic commerce has been around for a long time, electronic commerce has historically been prohibitively expensive for small and mid-sized businesses. The introduction of the Internet has made it possible for companies of any size to benefit from e-commerce. Figure 1 illustrates the electronic commerce value chain where the marketplace network is the Internet or Internet technology-based network. There are two orientations in the e-commerce value chain: (1) Transaction orientation and (2) Information orientation.

The transaction orientation

The transaction orientation is focused on business transactions that take place on the Internet, i.e., purchase orders, order confirmations, invoices, payments, etc. Network-based business transactions can be done by using the Internet or other types of networks. The characteristics of the different transaction-oriented electronic commerce solutions are listed in the table below.

<table>
<thead>
<tr>
<th>SOLUTION</th>
<th>CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTOMATED</td>
<td>No human involvement</td>
</tr>
<tr>
<td></td>
<td>Computer to computer</td>
</tr>
<tr>
<td></td>
<td>Time &amp; accuracy are critical</td>
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<tr>
<td></td>
<td>Computer system integration</td>
</tr>
<tr>
<td>HYBRID</td>
<td>Web-based purchasing</td>
</tr>
<tr>
<td></td>
<td>Computer to computer exchange of data</td>
</tr>
<tr>
<td></td>
<td>Flexibility and on-line information are critical</td>
</tr>
<tr>
<td></td>
<td>System integration to achieve efficiency and accuracy</td>
</tr>
<tr>
<td></td>
<td>Computer to computer exchange of data</td>
</tr>
<tr>
<td>HYBRID</td>
<td>Web-based purchasing</td>
</tr>
<tr>
<td></td>
<td>Flexible &amp; easy to use</td>
</tr>
<tr>
<td></td>
<td>Very low cost to the purchaser</td>
</tr>
<tr>
<td></td>
<td>Efficient for the supplier</td>
</tr>
</tbody>
</table>

Table 1: The Electronic Commerce Solution Characteristics

The information orientation

Information oriented transactions, on the other hand, are practically always restricted to the Internet. The Internet has opened vast opportunities for suppliers to exchange information with their customers. Information about product design, specifications, capabilities, and availability flows freely through the value chain, while the supplier gets feedback through the value chain on market demands and needs. This information is not only restricted to product information, services can be offered and demanded, project plans can be exchanged and worked on by several parties, and workgroups can be formed to exchange joint information. A basic characteristic of the information orientation is that no transaction or purchase is performed. The transaction or purchase has taken place or will take place depending on the information exchanges.
### Fully Automated Electronic Commerce Solution

The definition of a fully automated solution is that there is full integration between the information systems on both ends. A significant characteristic of the fully automated electronic commerce solution is that each trading partner only works within their business application. The process is initiated by either an application or by an operator registering information into the business application. An example, for instance, is registering purchase orders in the purchase order system. The electronic commerce system will then automatically communicate this purchase order to the vendor. In a fully automated system all further exchange of information will be done by software applications. All necessary actions are triggered by the system. Companies with established trading relationships are using fully automated solutions with suppliers and/or customers. Usually, the trading pattern is high volume and repetitive in nature. Important aspects are lead times, fault tolerance, and accuracy.

![Diagram](image)

**Figure 2: The Fully Automated E-Commerce Solution**

### The Case of the Automobile Industry

A common trait for the automobile industry in more recent times has been “just-in-time” delivery and manufacturing. Since cars are high cost items, excess inventory is costly, and there is a risk of producing units that will not move in showrooms, increasing the need for discounts and purchase incentives. As a result, automobile manufacturers have increasingly pushed the inventory risk of raw material and sub-assemblies over to their suppliers, resulting in a massive focus on delivering materials and sub-assemblies only when needed by the manufacturers, a concept commonly known as “just-in-time” deliveries. In fact, it is fairly common for a supplier to build a new factory and warehouse close to the automobile assembly plant in order to fulfill the terms of their contracts of delivering just-in-time. Naturally, this has also
led to high demands on the information system infrastructure in both organizations. The automobile manufacturers have fully automated assembly plants, where each and every aspect of logistics, planning, and purchasing is being handled by the computers. The human involvement has been reduced to the minimum, as the risk of not having the right part at the right place at the right time is too high. Car manufacturers have demanded that their suppliers cater to this situation by instituting similar information-systems capability on their side to handle the flow of information back and forth. Most supplier contracts within the automobile industry have specified time limits for the processing and response to any given exchange of information, with accompanying fines should these limits be exceeded. Some also risk the cancellation of contracts should they miss deadlines repetitively. In this environment, electronic commerce is not only an efficient tool it is absolutely necessary in order to operate the business. It also means that there is a very high level of integration between the information systems being used on both sides, and the exchange of data is fully automated. This characterizes the Fully Automated Electronic Commerce Solution.

Figure 3: The Hybrid E-Commerce Solution

**Hybrid Electronic Commerce Solution**

Hybrid electronic commerce solutions use the World Wide Web in the electronic commerce process. The hybrid solution implies that there is at least one manual process involved to complete the exchange of data, and that this operation is done outside the customer’s business application. A typical configuration could be a distributor that uses a web site that allows customers to manually make purchases. Four criteria have to be fulfilled to qualify as a hybrid solution: The customer enters the purchase order manually on the suppliers web site. The order confirmation is returned from the supplier both to the browser as a web page, and an application-readable structured message (order confirmation/purchase order copy) is returned by e-mail. The structured message is automatically interpreted and registered in the customer’s business application/ERP system. On the supplier side, the
process will be totally automated, while on the customer side there is one manual operation only – entering the purchase order on the web. The hybrid solution ensures that there is a complete integration between the business applications of both trading partners. The hybrid solution offers some superior qualities compared to the fully automated solution and the manual solution. Compared to the fully automated solution the hybrid solution is superior under the following circumstances:

- The customer wants to have instant access to product availability before purchasing.
- The customer wants to have information about delivery times prior to purchasing.
- The customer wants to have information about substitute products available and the availability and delivery times of such products.

None of this information is available in a fully automated e-commerce solution since the purchase order is either generated automatically or the person entering the purchase order can only access information stored in their own business application. Yet, the hybrid solution is inferior to the fully automated solution when the above mentioned circumstances are not of importance. The hybrid solution is superior to the manual solution under the following circumstances:

- The customer needs to have all purchase orders registered in his own business application.
- The volume of purchase orders from the specific supplier is large enough to defend the substantial investment the hybrid solution needs compared to the manual solution.

The hybrid solution is not yet widely in use because the software technology is not commercially available yet. Companies can create a hybrid solution today by combining a web site for customers to make purchases as well as software for fully automated solutions to send an order confirmation to the customer. However, the technology where a structured message is sent back to the customer in ActiveX, XML or, Java Bean and integrated with the customer’s business application is not yet available. DiCentral is in the forefront of researching this technology and is committed to

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Figure 4: The Manual E-Commerce Solution
providing products that enable companies to take advantage of the superior qualities of the hybrid electronic commerce solution. We think that the hybrid solution will grow to become the most important business-to-business electronic commerce solution for purchases of production related products. The flexibility and integration capabilities of this solution satisfy both the supplier’s and the customer’s needs and wishes for an efficient electronic commerce solution. The hybrid solution truly reduces costs and increases the productivity of the trading partners, but it especially caters to the needs of the customer when using the World Wide Web to purchase products.

Manual Electronic Commerce Solution

The modern manual electronic commerce solution is focused on Internet shopping, where there may be no prior relationship between the supplier and the customer. The key distinction between the manual electronic commerce solution and other solutions is that there need not be any prior relationship between supplier and customer since there is no data flow between the parties’ applications. In both the fully automated solution and the hybrid solution both parties need to agree on the structure of the application-to-application data flow. These characteristics make the manual electronic commerce solution not only the only viable solution for consumer-based electronic commerce, but also superior for new and infrequent business customers. The manual solution provides an effective tool, as it does not require any system integration on the customer side. Thus, the manual electronic commerce solution does not require an investment from the customer. For small and medium-sized businesses with low volume this is a very efficient way to purchase goods from their vendors. The purchasing volume for such companies is not large enough to make the necessary investment to move into a hybrid electronic commerce solution or a fully automated electronic commerce solution. The supplier’s web site gives the customer immediate feedback on stock availability and delivery times. The supplier enjoys the benefits of selling and marketing on the World Wide Web and, depending on the level of integration with the business application, the supplier can enjoy cost reductions and productivity increases in order-entry and order-processing. The manual electronic commerce option is well suited for purchasing nonproduction products, such as office equipment, since the customer’s need for updating internal inventory systems is limited.

Summary

As technology has evolved e-commerce has made the transition from being the exclusive domain of large, resource-rich organizations to a means of communication and exchange of transaction information for companies of all sizes. The challenge for a modern business is to select the electronic commerce model that provides the greatest return on investment while also providing the greatest benefit to the organization.

About DiCentral

Founded in 2000, today DiCentral is a leading global innovator in the EDI (Electronic Data Interchange) industry segment. A broad range of Software plus Services solutions enables a seamless exchange of data throughout supply chain networks. DiCentral’s integration solutions are scalable to the size, growth, and unique requirements of each business. In addition, DiCentral develops and markets a complementary suite of supply chain applications for retailers and suppliers, including EDI Testing, Global Enablement, Web EDI, Managed Services, and more.

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