

Internet Commerce: Security Is Still A Concern

Ken Griffin, (E-mail: keng@mail.uca.edu), University of Central Arkansas
Paula D. Ladd, (E-mail: paulal@mail.uca.edu), University of Central Arkansas
Roy Whitehead, Jr, (E-mail: royw@mail.uca.edu), University of Central Arkansas

Abstract

As the number of organizations that advertise over the Internet continues to grow, they are looking for opportunities to expand their market areas through electronic commerce. However, the majority of potential users are still concerned with the security of their transactions over the Internet.

Introduction

The Internet has far surpassed the initial expectations of many experts and analysts in the realm of on-line commerce. In fact, the United States Department of Commerce projects that \$600 billion in annual revenues will be generated by sales of goods and services over the Internet by the year 2000 (Lavelle, 1997). According to Mark Gibbs and Richard Smith (1994), hundreds of smaller networks are connected to the Internet each month, and this trend is not expected to slow in the near future. Because of the size of the Internet and the millions of individual connection points around the globe, the distance that financial information must travel from buyers to sellers or to financial institutions is dramatically increased. North, Hubbard, and Johnson (1996), suggests that "with the increased distance, the data must travel through many separate systems and over thousands miles of communication lines before reaching its destination". At any point in this journey, the data could be intercepted if a secure channel is not used. In other words, a major factor preventing the Internet and World Wide Web from becoming a primary commerce option

is lack of confidence in adequate security (Halevy 1996).

Recognizing the Importance of Secure Commerce

Competing in the Business World

The Internet and World Wide Web allow small businesses the opportunities to seek out much larger markets than they have traditionally had access to in the past. The potential to reach over 30 million users world-wide allures many businesses to the Internet each month. Commerce over the Internet can also save government millions of dollars. According to Lynn Heer of the University of Tennessee's Center for Industrial Services, the United States Department of Defense alone would save over \$1.2 billion over ten years. Furthermore, the Air Force would save over \$135 million annually due to the reduction in technical documentation as a result of using electronic commerce to exchange product documentation with defense contractors (Knight 1995).

Internet Commerce may also be the driving force behind a common Internet currency.

Readers with comments or questions are encouraged to contact the authors via e-mail.

By allowing banks to exchange currency for a standardized form of Internet currency, it would be better for both the consumer and the business. It is much safer to exchange digitally encrypted certificates than to transmit credit card information across the Internet (Flohr 1996). The certificates are easily tracked, allowing for accountability of funds as well as added security against theft (Stahl 1996). The overall atmosphere of the Internet is one of convenience. Internet users prefers the quick purchase and instant gratification that on-line commerce provides.

Purchasing Products and Services on the Internet

Using the Internet for funds transfer, companies can build a market and profit from Internet commerce. Purchasing goods and services via the Internet is different from traditional methods including telephone orders or store shopping. The ability to seek out exactly what is needed, locate additional information about the item or company selling or producing the item, purchasing the item via electronic commerce and receiving instant notification that the order has been completed and is being shipped is appealing to many. Among the benefits of on-line shopping, the lack of human contact is appealing to many on-line shoppers. The customers are not pressured by sales people or fast talking telemarketers and have the ability to shop at any time because the Internet never closes (Anderson et al. 1996).

External Forces Threatening Security of Transactions

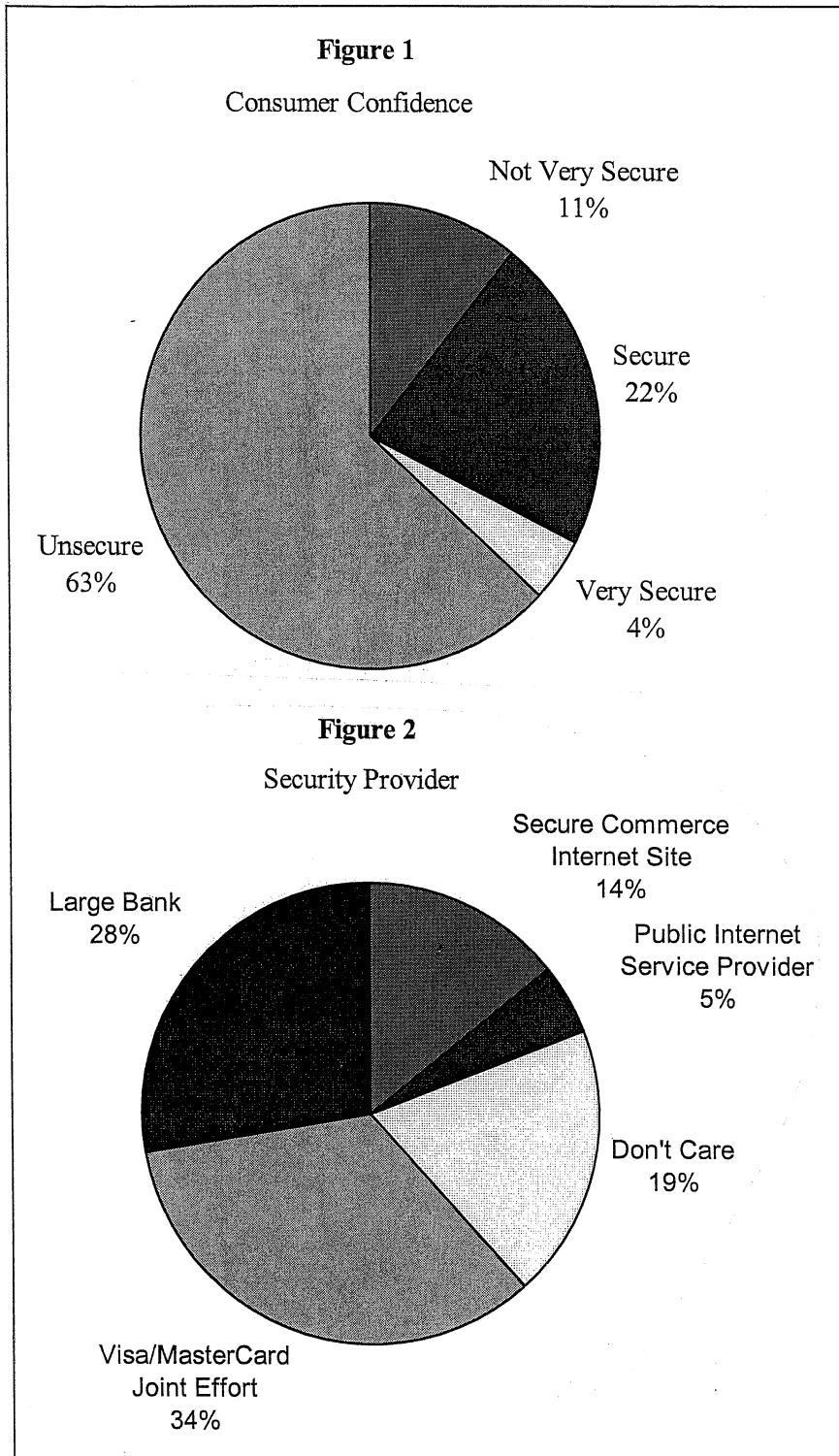
According to Knight, Citibank lost almost \$11 million to Russian computer hackers who broken into its electronic funds transfer system and transferred money to different accounts. The computer hackers, or entrepreneurs as they prefer to be called, are difficult to stop. Visa has also been hit hard by hackers. Visa has over 442 million card holders and lost a total of \$1.3 billion last year to counterfeited and fraudulently used cards ("Frequently Asked Questions About Secure Electronic Transaction" 1997).

In spite of credit-card fraud, the transmittal of personal financial information over the Internet is a security issue that has many consumers worried. As Knight said, "It's a new kind of war, and there is no territory to defend, no factories to bomb, no soldiers to kill". With the use of credit-cards also comes the personal information that consumers entrust in the credit card companies. When applying for a credit-card, the company requires that you submit all of your past credit history and financial information. Among other things, if intercepted during a transmission, your social security number alone could be used to bring chaos to your finances. Hackers use attack software which has no visible effects on systems, allowing them full access to unprotected systems, and making them nearly impossible to trace or to detect.

Result of User Survey

An interactive user survey, similar to those used to allow users to make on-line purchase was constructed and placed on an Internet site. Those surveyed were 141 Arkansas citizens accessing the Internet through various on-line sources. Fifty-seven percent of these surveyed indicated that they were familiar with Internet commerce but only thirty-four percent had made purchases using the Internet. Figure 1, shows that there is a feeling of lack of security when transmitting credit card or other financial information over the Internet.

When asked which method of on-line commerce they would feel comfortable using one hundred per cent of the users responded that credit cards were preferred to other methods including on-line personal check verification, DigiCash, First Virtual, CyberCash and NetBill. These methods are the most recent entries in the race to provide secure Internet commerce. Users, if given a choice of who would provided secure commerce for their transactions, chose a joint venture between Visa and MasterCard, two long-time credit card companies as shown in Figure 2.



In most businesses, making and maintaining contacts with people is very important. This is because the business on-line market place involves a relationship between companies and customers. Businesses have found that conducting Internet Commerce can significantly reduce their advertising expenditures. The costs of creating and maintaining a company home page on the Internet is much cheaper than advertising in print media, with radio or television. Companies doing business on the Internet are connected globally, providing 24 hours access to customers and potential customers around the world that are connected to the Internet. In addition, companies are likely to increase their sales volume when their markets are extended internationally beyond the limitations of the domestic market. Furthermore, the companies indirectly enhance their images on the Internet by providing quicker response times to product and sales inquiries through electronic mail and interactive World Wide Web sites. Some companies even offer direct chat rooms on the Internet to discuss products, measure user responses to their products, and provide 24 hour technical support.

Recognizing the Importance of Internet Commerce

Advantages and Disadvantages of Internet Commerce for Businesses

One of the major disadvantages of doing business on Internet is the cost of setting up the secure transactions. The costs range from several hundred dollars to over \$250,000 for extremely large and complex systems (Wilder

1996). This is a big disadvantage to smaller companies wanting to provide secure transactions for their customers.

Advantages and Disadvantages of Internet Commerce for the Customers

Purchasing merchandise on the Internet is a very convenient form of shopping. Customers are able to browse through interactive Internet Malls viewing the latest products even before they appear in the real malls. Researching large purchases like automobiles and new homes can be done using the Internet which avoid expensive long distance telephone calls and travel expenses. In addition, Internet purchasing may be good for consumers because it provides anonymity for those that are uncomfortable talking to sales representatives.

Although purchasing through the Internet is convenient, it is possible that the information (credit card) that is provided to vendors could be stolen by hackers or misused by the vendors themselves. The size and relative anonymity of the Internet make it very difficult to measure the integrity of some vendors before making on-line purchases.

Methods of Secure Internet Commerce

Vendors can service global markets with a responsiveness and effectiveness that cannot be supplied by telephone, fax and other telecommunications, anything short of actually sending a representative out on a site visit. However, many problems such as fund transfer, credit-card fraud, and personal information falling into the wrong hands exist. Secure methods of Internet commerce allow people to protect their confidentially by scrambling their data. Credit card information can be sent over the Internet using electronic mail or Interactive Web Forms. This information is often not encrypted significantly or many times not at all and may pass through many systems before completing the transaction. Setting up a business to receive credit card transactions through the World-Wide Web costs less than \$500 (Tremblay 1992). Moreover, personal

checks can be used to purchase goods and services over the Internet. When making a purchase, consumers' check number, amount, date, account number, tracking number and user name, address, and telephone number are submitted using encrypted electronic mail or Interactive Web Forms much the same way as credit card transactions.

CyberCash offers secure credit card transactions through an electronic wallet downloaded from a diskette (Anderson et al. 1986). After installing the software, users enter billing information for one or more existing credit cards, then automatically logs onto the CyberCash host server to be registered and issued a password. If users want to buy something, the merchant sends the purchase request to CyberCash, which gets a verification from the bank that issued the credit card and sends the verification back to the merchant. CyberCash sends the user a verification notice; the merchant issues an electronic receipt and fills the order (Stahl 1996).

Security has become a great concern to all businesses wanting to conduct commercial transactions over the Internet. On-line credit card purchases are becoming big business, and both large and small businesses are striving to provide secure methods for customers to purchase their products.

Recommendations

Since the success of the Internet and World-Wide Web as a transmission medium for financial transactions and on-line commerce is dependent on the ability or inability to provide adequate security methods for such transactions, a few recommendations are offered to assist in deciding upon the most effective method of providing secure Internet commerce. Provide customers with an approved, secure method of submitting financial information through the Internet. For customers that are still reluctant, toll-free telephone access to submit information verbally can be provided (Flohr 1996).

Provide customers with an interface that is

easy to use and does not request irrelevant information.


Establish a membership program where customers that frequent the business on-line can submit their financial information one time and use a unique user ID and password to make future purchases (Anderson et al. 1986).

Conclusion

Internet users are familiar with Internet commerce but most users show a lack of confidence in the security provided when purchasing goods or services via the Internet. The lack of adequate security measures protecting valuable credit information is preventing the majority of users from purchasing products on the Internet. The most secure methods of Internet commerce are those where credit information is not transmitted over the Internet during each transaction but given to a third party for purchase verification services using a "wallet" approach to Internet commerce. While it is possible to ensure good security on the Internet, most users have not accepted the technology that will reduce the possibility of someone to eavesdropping on the message. Companies are going to have to assure their customers that the transaction is secure. This will require increased customer education on a procedure that has been given the stamp of approval by industry and government. Once the customer feels that the security issued is resolved look for Internet commerce to grow dramatically.

Implications For Future Research

The user survey highlights the concern between users of the Internet and organizations that wish to sell their goods or services electronically. Future research will focus on what organizations are doing to convince potential customers that their web site on the Internet is safe. Legislative action by government may well dictate what security methodologies will be legal as strong encryption technology as been challenged by the Clinton administration on national defense concerns. Also, what guarantees are in place that the electronic transaction is still secure once

it crosses international boundaries. 

References

1. Anderson, Cannell, et al., *An Electronic Cash and Credit System*, New York: Random House, 1986.
2. Flohr, Udo, "Electric Money," *Byte*. 74-84, June 1996.
3. Frequently Asked Questions About Secure Electronic Transactions," On-line. America On-line, April 24, 1997. Available <http://www.visa.com/cgibin/vee/sf/set/faq.html>.
4. Gibbs, Mark, and Richard J. Smith, *Navigating the Internet*, Indiana: Indianapolis, 1994.
5. Halevy, Libbe S., "Securing Security With Pinkerton," *Business NewsBank*, April 1, 1996,
6. Knight, Robert L., "Federal Government Developing Information Warfare Plan to Protect Against. Military, Commercial Espionage," *Asia Week*, pp. 18-22, July 16, 1995.
7. Lavelle, Marianne, "Coalition Wants State Moratorium on Net Tax," On-line. June 23, 1997, Available <http://www.lix.com/internet/0623nettax.html>.
8. North, Alexa B., Joan Hubbard, and Jack E. Johnson, "Inquiry-Based Learning Via the Internet," *Business Education Forum*, pp. 47-50, April 1996.
9. Stahl, Stephanie, "Instant Processing of Credit-Card Transactions," *Information Week*, pp. 35, September 2, 1996.
10. Tremblay, Wilfred, "Determining Value in Higher Education: The Future of Instructional Technology in a Wal-Mart Economy," *Educational Technology*, pp. 49-51, October 1992.
11. Wilder, Clinton, "E-Commerce Hosting Services to Expand," *Information Week*, pp. 30, July 22, 1996.

