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December 1999

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Recommended Citation

Huff, Sid and Wade, Michael, "First Virtual Holdings Incorporated" (1999). *ICIS 1999 Proceedings*. 76.

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FIRST VIRTUAL HOLDINGS INCORPORATED

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Executive Summary

First Virtual Holdings Incorporated was one of the first companies to design a payment mechanism specifically for the Internet. The company developed a system whereby buyers and sellers could complete transactions on the Internet securely and efficiently. The buyer would use his or her credit card, yet the credit card number would not be sent over the Internet. Instead, First Virtual would issue each buyer a “Virtual Pin,” which would be used as a proxy for the buyer’s credit card number. Students are left to analyze and decide whether the system will gain widespread acceptance among the Internet commerce community.

First Virtual Holdings Incorporated (FVHI) Chairman and CEO Lee Stein was driving along the San Diego Freeway thinking over the past 36 months. He felt satisfied that what was so recently just an idea, was now a reality. He knew that he was riding the crest of a wave, one that was about to change the face of commerce. It had become accepted wisdom that commerce on the Internet would blossom and flourish. The only real questions were when and, after the dust settled, who would be left on the playing field?

By any standard the progress made by the company he co-founded had been spectacular. First Virtual had become one of the most recognized names in the nascent world of online commerce. The First Virtual Internet Payment System (FVIPS) had proven itself to be secure and efficient. Nothing, however, was guaranteed in this business and Stein worried whether his company had the backing and the resources to make it through the inevitable industry shake-up. Specifically, he wondered about the decision to make the FVIPS an encryption-free system when most of FVHI’s competitors were using encryption. He also wondered about the company’s ability to attract enough merchants and buyers to make the payment system viable.

LEE STEIN AND FIRST VIRTUAL HOLDINGS INCORPORATED

A self-described “techno-junkie,” Stein was traveling to New York City when he began asking questions of a fellow traveler who was using a wireless device to communicate with the Internet. The other traveler was Einar Stefferud, a computer-savvy Internet veteran and expert on global messaging systems, who later jointly founded First Virtual with Stein. Along with Stein and Stefferud, the other founding members of First Virtual were Nathaniel S. Borenstein, a Ph.D. and the primary author of MIME, the Internet standard for multimedia and multilingual mail messages, and Marshall T. Rose, also a Ph.D. and a leader in the development and implementation of key global Internet standards.

Initiated by Dr. Borenstein, the original idea was simple: sell jokes by electronic mail on the Internet. "Every time you turned on your machine, there would be a joke waiting for you. If you liked it, you'd pay a penny. If you didn't like it, you'd pay nothing," Stein explains. A penny a day collected from millions of Internet users could add up to significant numbers, the team realized.

But the hang-up was the lack of a payment system. All four recognized the need for a secure, simple and widespread payment system for goods and services over the Internet, which led them into the business of electronic payment systems.

The company was built from the ground up to be a true virtual business. Its founders were based in San Diego, Silicon Valley, New Jersey, and Michigan. The company had no physical offices for its first 15 months of operation. In fact, for a while, no two members of the company had the same zip codes or telephone area codes. Their business cards contained only e-mail addresses and phone numbers. The servers were set up in a high security EDS facility near Cleveland; work-at-home customer service reps were hired to answer customer service requests by e-mail while the data lines were routed to an MCI facility in Atlanta; marketing was handled from Washington D.C.; public relations was based in San Diego. The company itself was registered in Cheyenne, Wyoming. Certainly not your typical organization.

Although the arrangement was flexible and allowed the founders to remain in their physical locations, the initial employees decided to consolidate most of the company's day-to-day operations in San Diego in late 1995. They found that some important aspects of running the organization were hampered by physical distances. Functioning as a virtual organization made it more difficult, for example, to maintain employee morale, schedule meetings, keep people up to date, and so on.

By the summer of 1997, the company employed 96 people organized into five functional groups under CEO Stein and the new president, Keith Kendrick, and ran all of its day to day operations from San Diego. FVHI launched its first major product, the First Virtual Internet Payment System (FVIPS) in October, 1994.

THE FIRST VIRTUAL INTERNET PAYMENT SYSTEM (FVIPS)

The FVIPS was based on the principle that no method of data security is truly secure, and that only non-sensitive information should be sent over the Internet. Using the FVIPS, buyers could make purchases using their credit cards, yet never send their credit card numbers over the Internet.

The first step for those who wanted to use the FVIPS was to send credit card information to First Virtual by traditional means, namely telephone, fax, or mail. They were then assigned a VirtualPIN—a series of alphanumeric characters. They used the VirtualPIN as an alias for their credit card numbers to make purchases on the Internet.

The system worked as follows. When making a purchase, the buyer sent his or her VirtualPIN to a participating online vendor. The vendor then forwarded the buyer's VirtualPIN along with the amount and a brief description of the purchase to FVHI. FVHI used the buyer's VirtualPIN and its internal network to look up the buyer's e-mail address.

First Virtual then sent an e-mail to the buyer confirming the amount of the purchase. The buyer returned the e-mail to FVHI either confirming the sale, "Yes," or not, "No." If the sale was confirmed by the buyer, FVHI charged the buyer's credit card for the amount of the transaction (via a network not directly connected to the Internet) and sent a confirmation number to the vendor. The vendor then completed the transaction by providing the service, or in the case of goods, shipping the merchandise to the buyer. The buyer also had the option of replying with the word "Fraud." If a buyer replied to a confirmation request with "Fraud," the sale was automatically cancelled and the matter turned over to FVHI for investigation.

At no time during this process was the buyer's credit card information typed into a computer connected to the Internet, nor did any sensitive information pass through the vendor, further reducing the chance of fraud. Unlike competing systems, the FVIPS did not rely on encryption of data, nor did it require the buyer to use special software or hardware to function. First Virtual's founders envisioned credit card companies having the ability to automatically create and distribute VirtualPINs, thereby creating mass distribution and eliminating the need for the consumer to take any action.

Merchants who wished to become sellers using the FVIPS could sign up at the company's web site. First Virtual had two categories of merchants: Express Merchants and Pioneer Merchants. Express Merchants were large and established firms with existing credit card merchant accounts. Pioneer Merchants, on the other hand, were typically smaller merchants that might not otherwise qualify for a credit card merchant account. Merchants paid First Virtual 29 cents per transaction plus 2% of the transaction price for each sale. Express Merchants received payment from First Virtual after three to four days. Pioneer Merchants were paid after 90 days (the legal limit in the US for reversing credit card charges).

As of September 30, 1997, the company had processed over 430,000 FVIPS transactions and had registered more than 3,800 merchants and 240,000 consumers in over 160 countries.

SECURITY

Director of Development Winn Rindfleisch described the FVIPS as procedural security, not technical security. “Many people think we’re anti-encryption, which isn’t true at all. In fact we use encryption and digital signatures when we send messages to our merchants so they know the message is coming from First Virtual.” Director of Strategic Business Initiatives Chris Wand added, “If we thought we needed encryption, or that buyers would be comfortable using it, we’d have it. Our challenge in this area is to create a system that combines convenience for the user along with a sufficient number of built in ‘levels of inconvenience’ to deter hackers and minimize the risk of widespread, automated fraud.”

Furthermore, Lee Stein pointed out, “If somebody’s account is compromised, the worst thing that happens is that the consumer notices the fraudulent transaction on his or her credit card bill and declines the charge. Put it this way: our charge-back ratio, which is usually tied to fraud, is extremely low.”

“Their electronic mail protocol is a pretty low-tech solution to doing Internet commerce, but it has the advantage that it’s pretty easy to understand exactly what the likely risks are—unlike some crypto-gizmo protocols,” said Alan Bawden, a computer researcher in Cambridge, Massachusetts. “There are risks, the biggest probably being that you have to trust them [First Virtual] with your credit card number. But I probably take a bigger risk when I hand my credit card to the teen-age clerk at the local hardware store.”

STRATEGIC ALLIANCES

From the beginning, FVHI’s founders recognized that making good strategic alliances with established industry players was critical to its success. They realized that the winners in the race for the Internet commerce market would not necessarily be the companies with the best products, but those who had the largest share of the market. With this in mind, they strove to develop relationships with the biggest and the best in the business. These included First USA Paymentech, Inc., Next Century Communications Corporation, Sybase Incorporated, GE Capital Corporation, First Data Corporation, Microsoft Corporation, Sun Microsystems, Inc., The Vision Factory, InterNIC, The Electronic Frontier Foundation (EFF), and Saatchi and Saatchi.

OTHER INTERNET COMMERCE PAYMENT SYSTEMS

By the beginning of 1996, there were dozens of payment systems vying for a place in the Internet commerce spectrum. Some specialized in very small transactions, called micropayments, typically a few cents or even fractions of a cent. These systems were primarily designed to pay for small amounts of information, generally one-time access to a particular web page or site. Examples of micropayment systems were “Millicent” from Digital Equipment Corporation, “Netcash” from Netbank, and “ecash” and “cyberbucks” from Digicash.

Other payment systems incorporated traditional payment means such as credit card or check but provided strong security features to allow safe passage of sensitive information. One prominent example was Cybercash, which used a browser “plug in” to facilitate electronic transactions using credit cards. Another system, PayNow, allowed users to purchase goods on the Internet using funds from their bank checking accounts.

Smart cards were also thought to provide a strong challenge to other Internet payment systems. Smart cards such as Mondex and Visa Cash were built with multiple levels of security to protect the integrity of online transactions. They could also be loaded up with cash through the Internet and used in participating offline locations. Perhaps the biggest challenge to online payment systems came from credit cards. There was some evidence to suggest that users were becoming more comfortable using credit cards to make online purchases with only moderate levels of security, or with no security at all.

MARKETING

First Virtual had a three-fold strategy for marketing the FVIPS to buyers and merchants. First, through press releases and traditional PR channels, FVHI hoped to attract the attention of journalists who would then publicize the company in the press. So far, articles concerning First Virtual and CEO Lee Stein had appeared in *Business Week*, *Newsweek*, *Fortune*, *The Economist*, the *New York Times*, the *San Jose Mercury News*, and elsewhere. Second, the marketing department targeted large transaction processors who might be interested in extending their business on line. Third, they targeted third party integrators, such as AOL, and large ISPs.

In fact, for much of its history First Virtual lacked a formal marketing and sales effort. Part of the reason for this was that First Virtual believed it was essential to have a stable, scalable infrastructure in place before significant marketing was undertaken. The company did not want to be in a position of not being able to meet demand.

FINANCIAL INFORMATION

First Virtual received its major initial financing from several strategic investors including First USA Paymentech, GE Capital, and First Data Corporation, who together invested \$12.5 million between December 1994 and August 1996. First Virtual Holdings Inc. went public on the NASDAQ exchange on December 13, 1996. The offering was for 2 million shares at \$9.00 a share. The gross amount raised by the offering was \$18 million (\$15 million net) and the stock price closed at \$9.00 after the opening day. The company's stock price floundered, however, and by mid-1997, it had fallen to \$5.00 a share. See Exhibit 1 for FVHI's Statement of Operations and Exhibit 2 for FVHI's Condensed Balance Sheet.

CURRENT ISSUES AND PLANS FOR THE FUTURE

FVHI had achieved remarkable growth since its inception. The FVHI user base and transaction volume had doubled about every six weeks. As part of a continuing development program, the company planned to internationalize the FVIPS to include multiple language and currency support, to develop better support for microtransactions, to provide better support for the sale of hard goods, and to add additional mechanisms for buyers to pay into, and sellers to receive payment from, the FVIPS system. They also planned to open the system to participation by multiple processors and acquirers in the banking world.

Despite the growth and the new product ideas, First Virtual's future was certainly not guaranteed. The company was still a long way from profitability. Widespread acceptance of the FVIPS would be necessary to guarantee its success and the market was crowded with alternate payment schemes and players. It was still to be determined whether the FVIPS was the payment system most suitable to the Internet of the future. Questions remained about the tradeoff between security and convenience. How much convenience would consumers be willing to sacrifice for greater security? Despite FVHI's successes, retail electronic commerce on the Internet had not yet met most analysts' expectations.

As he exited the freeway and approached First Virtual's offices, Lee Stein wondered briefly where the company would be a year from then. Stein knew that in an Internet-based business such as his, one year was equivalent to five to ten years in a "real" business, so trying to think a year ahead was long range planning indeed.

This is an extended abstract of the case. To receive an electronic copy of the full version (23 pages), please write to, or e-mail Michael Wade at the address below:

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An earlier version of the case is also available from Ivey Publishing at <http://www.ivey.uwo.ca/IveyPublishing>.

Exhibit 1**First Virtual Holdings Incorporated
Statements of Operations**

	Three months ended December 31,		Year ended December 31,	
	1996	1995	1996	1995
Revenues	\$197,604	\$110,672	\$695,866	\$197,902
Operating expenses:				
– Marketing and Sales	1,091,539	104,314	1,836,545	346,400
– R&D	1,747,700	339,951	3,248,958	530,809
– G&A	2,126,807	263,007	6,431,286	1,522,784
Total op. expenses	4,966,116	707,272	11,516,789	2,399,993
Loss from operations	(4,768,512)	(596,600)	(10,820,923)	(2,202,091)
Int. income (expense)	58,886	(15,833)	130,983	(67,890)
Net loss	(4,709,626)	(612,433)	(10,689,940)	(2,269,981)
Net loss per share	(0.54)	(0.07)	(1.25)	(0.30)

Exhibit 2**First Virtual Holdings Incorporated
Condensed balance Sheets**

	For the year ended December 31	
	1996	1995
Assets		
Total current assets	\$17,500,089	\$2,102,604
Total fixed assets	\$2,192,468	\$472,222
Total assets	\$19,692,557	\$2,574,826
Liabilities and stockholders' equity		
Total current liabilities	3,236,037	622,403
Amount due to stockholder	312,500	—
Notes payable to stockholders	1,200,000	1,200,000
Total stockholders equity	14,944,020	752,423
Total liabilities and stockholders' equity	\$19,692,557	\$2,574,826