

The following is my thesis written for the Stonier Graduate School of Banking conducted by the American Bankers Association at the University of Delaware.

March 1, 1995

Executive Summary

When today's children grow up, banking will look very different. Enormous technological advances will make banking as effortless as watching television or making a phone call. Robert Barone, Diebold President and CEO says "Customers will be able to walk through an entire branch, visit customer service representatives and conduct banking transactions electronically, all without having to move an inch from where they are sitting." Diebold is a national distributor of bank equipment. Most transactions will take place on a home computer. Applying for a loan, purchasing shares of stock, and opening a new checking account are just some of the things that people will be able to do at home.1

I chose a Management Analysis Thesis for my Stonier project. I not only identified and analyzed an opportunity within our bank, I determined a course of action that was actually implemented. "Should a community bank implement an electronic bulletin board system?" I believe that the reader will find the implementation a unique story utilizing a fascinating technology.

Apollo Trust Company provided me with an advantage that not many small banks enjoy. Our bank utilizes an in-house computer system. We also have excellent personnel to make that system run well. Our bank has always been on the forefront of the latest technological advances which today includes information, document and check imaging systems. Our philosophy has always been to try to do as much in-house as possible. For example, Apollo Trust Company prints one- third of all customers checks on-site as well as loan coupon books. In fact, after a customer opens a checking account, he/she usually leaves the bank that day with a book of addressed checks. Upon the closing of a loan, the customer always walks out the door with his/her coupon book.

This ongoing push to improve our bank's technology is a constant reminder to each of us that the educational process never ends. A related benefit to this aggressive approach is the challenging opportunities that many in our bank find both fulfilling and rewarding. This approach also encourages creative thought and discussion within an industry that is known for its conservative nature.

In the main office of Apollo Trust Company there is a traditional bulletin board in the lobby that proudly displays bank achievements, community accomplishments and local information. I believe that the electronic board system (BBS) is not only a natural compliment but is also the evolutionary link to our community of the future. Our on- going commitment to provide excellence is the force that drives the engine.

The bank's in-house system is a provider of information for people's use on a daily basis. In addition, our systems and knowledge have been used by others in our community to assist businesses, volunteer organizations and churches. The speed and accuracy of information is essential since the customer wants this on a timely basis.

Banks are continually exploring new ways of providing service to its customers. Many banks now have a financial planning department where customers can get advice and information concerning their financial status. Access to information and the ease of getting this access is the driving force for much of this exploration. It was the driving force behind this project. And it will continue to be the driving force for future developments as the need for information access sky- rockets.

To further underscore the ease to which technology has made information available, most of the research material found for this project was downloaded from CompuServe, a popular on-line system. All the footnotes found in this paper referencing magazines and newsletters were retrieved through my home computer using CompuServe.

Many believe as I do, that information is power. Those that control the flow of information will undoubtedly be a magnet for the growing appetite of people wanting information. Accessibility to information is arguably the greatest opportunity people have to educate themselves for a better tomorrow.

Dick Chaney, former Secretary of Defense, addressed the Pennsylvania Banker's Association on March 14, 1995. In his speech, he noted that our strong defense and the flow of information sweeping across the former USSR eventually crumbled communism. He further pointed out that this flow of information, this flow made possible by freedom, is slowly eroding the centralized power in China. Communism could only last as long as information was kept corked in a bottle and controlled by the central government. As access to travel, television and now the Internet allowed ordinary Chinese citizens to hear about freedom the way it actually is instead of the way it had been taught, communism's collapse is inevitable as long as the United States remains strong and prepared.

In our own country, there is an ongoing debate about poorer communities outside metropolitan areas that would be denied the information superhighway. Apollo is one of those rural communities. It was quite natural for me to describe, analyze, recommend and implement a system that would, in some small way, contribute positively to the well-being of our community.

Does a community bank BBS make sense for Apollo Trust Company? Is there a need? What is the cost? Should banks be into that sort of thing? There were many questions that needed to be addressed.

The labor involved with the development of a BBS would be extremely great. The cost of a BBS would rise as the demand for new and improved services intensified. As I began to see new opportunities that could not be anticipated, I realized the cost would escalate.

If someone told me a year ago that our bank would be running a community bulletin board and providing Internet access to the community, I would have told them they were crazy. Perhaps most noteworthy was the education I received as a result of this project. I painstakingly learned that the BBS was the tip of an information roller coaster that was leading me wildly toward the Internet.

The implementation of becoming an Internet provider was an ambitious task for a small university with a paid staff let alone a small, community bank with a rag-tag group of volunteer labor. The hard work of our internal auditor, a host of volunteers and myself would soon bring a proud, new smile to our little town.

The development of an electronic banking bulletin board system would indeed become quite useful to our bank and extremely productive for our surrounding community. Home PC banking where customers could not only apply for loans, examine current deposit balances and order checkbooks, but could also

make transfers between their accounts became a reality. This provided a great competitive edge for our bank.

The deluge of interactive communications on the BBS between Apollo residents was a surprise to me but probably not a surprise to those that know that Apollonians love to discuss their community and their proud heritage. Another surprise was the rise of computer literacy among local citizens. Computer literacy increased dramatically in my condominium complex and spread like wildfire among the local high school students.

The opportunity to provide a forum for community information relating to business and volunteer organizations was an excellent marketing tool. Providing educational files to the public was another wonderful service.

And finally providing Internet access to the Apollo community was the crowning achievement of this small idea from a year ago. To see our local library receive a state-of-the-art computer system donated by a local economic development group to provide Internet access to everyone, including the poorest in the community, is an experience I will long remember.

I would say that in many cases, we created an unexpected need among the local community. Some became absolutely addicted to this little BBS. Others found themselves operating their own little businesses through the Internet. And many high school students found themselves with a variety of maintenance chores that I was all too happy to distribute.

This Stonier project forced me to do much more than write a document. It provided a small impetus for the economic welfare of our community. And that is reminiscent of the original principles that the founders of Apollo Trust Company had in 1871 when they established our bank. Mine was a unique idea but not a unique philosophy. It was merely an extension of the wisdom of the people that went before me at this great financial institution.

Description

Community banks are often found in rural communities. Some might argue that they have thrived in these communities because they are an efficient means for the lending of funds and the safeguarding of assets. This is certainly true of Apollo Trust Company which is where I work.

Banks like Apollo Trust Company have obviously played an important role in the development of rural America within the free enterprise system. Their role has been so vital that Boris Yeltsin has sent many Russian bankers to the United States to not only study banking but also to study the efficiencies of community banking. At the 1993 Pennsylvania Bankers Association Convention, I heard an international speaker plea for community banks (not large banks) to send community bankers to Russia. He believed that there was an urgency to help Russia develop a less centralized banking system like the United States.

Community banking is a relationship business. Loans are often made on the basis of being familiar with the customer. Likewise, deposits are often made because a customer may feel a relationship with his/her banker. Because of this relationship banking, the rural community bank often holds a highly visible public role in their town. There are often high expectations of what a bank should do for their community.

One example of those expectations might be that community bankers are often expected to live within

their bank's community. Another example might be that community bankers are expected to voluntarily participate within public service organizations.

Therefore, it should come as no surprise that rural community banks are much more than a place to borrow and save. These banks are often the site for public service meetings. They can sometimes be a place where people come simply to converse. And they can even be a place where people find out what's going on in town. It is not uncommon for a community bank to have a bulletin board in their lobby listing the happenings and the events in the area. Some service organizations may be allowed to advertise their events. Groups may be allowed to sell bake goods or raffle tickets inside the bank. A community bank is often a highly visible gathering place in rural communities. It is a place where the most basic news, information and stories are passed from one person to another. It is a place where you can hear about almost anything.

In more recent times, many independent, community banks have been able to compete effectively in smaller markets against larger banks. They have done this despite the competitive advantage that large banks enjoy through the economies of scale. Therefore smaller banks have had to offer something that larger banks did not. And this something extra has often come in the form of personal service.

Community bankers know that personal service is something everyone appreciates. However community banks must be more than good neighbors. They must be able to provide the same products as larger banks or they simply cannot survive.

In the spring of 1994, I began to take a look at the future of home computer banking within a rural community bank setting. Would customers simply want to be able to make transactions from their home PC or television set? If so, wouldn't larger banks crush community banks by being able to offer them a network of PC products that would be cost prohibitive to smaller banks? Everyone knows that entry into the home computer banking market is simply a matter of time. How could a small bank possibly compete? On a personal level, what were the implications for my future? Would our bank be left behind technologically and unable to survive? Would home computer banking destroy us? Those were tough questions.

It might sound unrealistic that a small bank could be a pioneer within this highly competitive arena. But I began my search by first trying to understand what was currently available. I logged onto CompuServe in April of 1994. First, I had to learn how to move around inside this electronic wizardry. After I became somewhat familiar, I began to ask people around the world about their banking practices in the countries where they lived. I accumulated many responses and found nothing that helped a great deal although there were plenty of illuminating responses. I learned that they use rubber money in Australia, that there are no checks (as we know it) in Switzerland and that there are four large centralized banks in Russia. I also learned how to dialogue with people from other countries on-line which was great fun.

However something hit me as I was gathering this information. CompuServe was nothing more than one, gigantic bulletin board. In many ways it was no different than the physical bulletin board that we had in our bank lobby. CompuServe was a place where people came together to exchange information. People would often be talking about anything that came to mind. That behavior was precisely the activity I often witnessed whenever I was in the lobby of my bank.

I quickly learned that there was one big drawback to bulletin board systems (BBS) like CompuServe, On-Line America or Prodigy. That drawback was that the telephone charges from a rural location were high. These large services had reasonable monthly fees but a toll call to a major city to get "plugged in" became very expensive. People in large metropolitan areas had a big economic advantage tapping into this information superhighway.

Next, I was introduced to a BBS that a local person was running out of his home. I learned that BBS's have been around almost as long as personal computers. A BBS has at least one modem attached to it to receive calls and to provide a link. A link consists of two modems sending information back and forth over what is called a carrier signal. All of this functions transparently to the user. When I first logged in, I visually saw fun and games; however I also saw a subculture of people out there that was about to become the mainstream culture. This seemed to be an enormous untapped opportunity.

I decided that it would be worth a look to develop our own BBS. This BBS would provide local callers with information about their community. It would provide an opportunity to network with other callers. It would provide access to files that other services provided. And finally, it would be the genesis for home computer banking which I hoped would be the crown jewel of the BBS.

At a local computer club meeting I proposed the idea of a community bulletin board system. Surprisingly, many in attendance saw the benefits that I saw. Some citizens actually offered to volunteer a great deal of time and expertise, and one person even suggested providing Internet access to the community.

The impact was obvious. If Apollo Trust Company could establish a community bulletin board system, it would not only provide goodwill to the community, it would draw customers to the bank. By virtue of the technology and sophistication involved, these customers would generally be younger, educated and likely to have higher disposable income.

In the summer of 1994, I began reading how these BBS's were springing up everywhere. I knew that if our bank was ever going to get a head start on the competition, it had to be done quickly. There would be a tremendous competitive advantage in being the first bank in our area to offer this kind of innovative technology.

In addition to the wonderful benefits the bank might reap from the development of this system, there was a deeper motivation for beginning to study this idea. Apollo is located 35 miles east of Pittsburgh, PA. Once a heavily industrialized area, Apollo has suffered substantial economic dislocation. Many area children were forced to leave the region to find work. Local industry has been redirected into a multiplicity of smaller tool, die, metal working and finishing companies. I believe that the region's ability to attract high-tech enterprises is conditioned upon the development of a technically competent citizenry and a community sufficiently connected to the mainstream of technological thought and development to foster continuous advancement and development.

During April 1994, local television and local newspapers did a series of negative reports which were devastating to the sensitive morale of the community. Apollo had been the site of a nuclear fuel rod processing plant. The media spread fear in the community that Apollo was a dangerous place to live. Our community witnessed contractors pulling out of deals to develop new housing as a result of this publicity.

Apollo and the surrounding communities were and continue to remain economically depressed. Over 25% of the population is on some form of public assistance. Some believe that government assistance only breeds more government assistance. I am one of those who believes that. Government should be looking at ways to give everyone the opportunity to help themselves. In our rural community, home based opportunities would be ideal. The transition to an information based economy coupled with evolving information technology would make it easier for citizens to live in rural and semi-rural areas while fully participating in productive economic activity.

Each of the leaders in the community had to look in the mirror and evaluate what we could do to elevate

our bludgeoned public perception. If Apollo was swallowed by the winds of economic collapse then many businesses including our bank could eventually fail as well. Although Apollo had suffered substantial economic dislocation, its people were not willing to accept its losses and lower standard of development and living.

I proposed my idea to many others in the community. However the real support I needed would have to come from my bank. The Chairman, CEO and President of Apollo Trust Company enthusiastically endorsed and embraced the idea. Her progressive thinking and positive influence would become very instrumental in the development of a BBS. As Executive Vice President and a Director of our bank, I had enough influence with management to ask for their support as well.

Overall, management was enthusiastic and supportive. Some employees asked if they could experiment with the BBS after work as it was developed. Management didn't always understand everything I was talking about as I introduced the idea. In fairness to most, it was not always easy to imagine something that had never been seen before like the Internet.

There were a number of issues that management asked me about. "Would anyone actually use this thing? Were BBS's simply a fad that would pass with the introduction of things like interactive television? What were we going to spend to get this up and running? Who would actually run this thing? Would this look like a cheap gimmick? And most important, did we have anyone with the computer capability to handle a variety of issues that we would eventually encounter?"

Since I determined that this would be a challenging project, I knew that I was going to have to painstakingly develop the computer capabilities necessary to establish a BBS. I never had a computer class in high school or college. However, I had been in public accounting for a couple years and it was there that I became comfortable with personal computers.

Very early in my research, I came to the uneasy realization that there was no information available anywhere for a bank that had attempted to develop its own local BBS. There was however, some good information available for banks that had attempted home computer banking without a BBS.

To date, home computer banking has been tried with mixed results. Many banks that have tried found themselves abandoning their efforts. "For well over a decade, electronic banking pundits have been predicting the rise of the remote banking services provided to the home and business via terminals. During this period, a handful of ambitious PC-based home-banking tests have failed for lack of customer support or have continued with small, loyal followings. More successful were PC-based cash management services for commercial customers and telephone-based inquiry services."² This was true in our area of Western Pennsylvania. PNC and Dollar Bank has offered PC- based cash management services to its commercial customers with some good success.

Historically, home computer banking has suffered from some major weaknesses. First, technology was expensive - not everyone could afford to own a computer. Second, like a VCR, most people didn't understand how to fully utilize a computer's capability. Third, many computer owners didn't have a modem or didn't understand the communication packages that came with their modem. Fourth, the costs banks charged for home computer banking was prohibitive.

"What's different now compared to a decade ago is that the cost of the technology has come down dramatically; personal computers with modems are increasingly used in the home and customers' banking behavior has changed," says Linda Parker, vice president and manager of remote banking for US Bank of Washington.³ And even within Apollo Trust Company, we have watched our personal computer purchases soar from two terminals in 1993 to over thirty workstations in 1994. Furthermore,

the last five personal computers purchased included modems. The cost of modems has dropped so dramatically that most vendors today simply throw them in as a necessary part of doing business.

While I found many articles cautioning the approach taken to home computer banking, I didn't find any articles suggesting that banks could somehow capitalize on the opportunity to bring additional information services to its customers. Providing access to information was an enormous opportunity.

Many have chronicled debilitating stories of lost opportunities for banks. Banks have had to sit on the sidelines as nonbank/banks have gobbled up a tremendous share of their loans and deposits. Companies like GMAC, AT&T and Sears have been at a competitive advantage over banks as they can provide these products without the outrageous regulatory costs or the cost of FDIC insurance that banks must pay. However these nonbank/banks saw traditional bank products as an adjunct to their services instead of the end product.

I believe that the next real threat of nonbank/bank competition will come from information providing companies. Home computer banking was attempted without much success by huge on-line computer information companies like CompuServe and Prodigy. Prodigy still offers MAC services though only a few banks still participate. Fortunately for banks, these attempts have been dismal. But not for long. The ability for ordinary customers to have access to PC-based banking is simply a matter of time, and that time is now.

I have no doubt that if the FDIC could resolve how to regulate the flow of creative thought or the flow of information for banks, they would. What greater opportunity for a bank could there be than to provide a new service for its customers that would be vital, relevant and not regulated by the FDIC? Banks have been known to occasionally run promotions by offering prizes like toasters or televisions. Why not lure customers by providing the product of the 90's - information? Or would banks be left sitting on the sidelines yet again as a new form of nonbank/bank competition eroded its dwindling hold on commerce?

There are no banks currently providing it's customers with a local BBS or Internet access that I could find within the United States. I posed this question to many forums run on CompuServe and Prodigy and struck out.

Some might argue that it is ludicrous for banks to be in the information arena. I disagree. Community banks cannot afford not to be. Community banks are not just competing against big banks, savings & loans and credit unions. It isn't enough that banks merely provide products and good service. And it won't be enough for banks to simply provide home computer banking services. Home banking has to be linked to a variety of services. From my own experience, I don't want my computer to be required to dial one number for one service and another number for another service.

"Remote banking services will lose their competitive value unless banks can add unique information services to their offerings."⁴ The electronic one stop shop is a threat not much different from the threat that large malls presented to the small grocery stores of yesterday. Just as people are drawn to malls so that they can buy everything in one place, so too will people be drawn to electronic malls that can take care of everything in one place including banking. Service-providing links to CompuServe and Prodigy could be prohibitive to community banks. Large banks from around the world will be the dominant forces on these services.

But there is a great equalizer for community banks. That equalizer is the Internet. "Electronic services offered by banks will likely include other value-added services such as analysis tools, live market data and selected market rate feeds. This is information banks can currently access but can't provide directly to the customer." The use of the Internet to transmit data back and forth will improve efficiency,

decrease cost and, best of all, improve customer service.⁵ The Internet opportunity will be addressed later.

Analysis

My analysis for the development of our BBS would be as follows:

- 1) To provide home PC Banking.
- 2) To provide interactive communications between the residents of Apollo.
- 3) To provide a forum for community information related to business and volunteer organizations.
- 4) To provide a marketing tool for the bank as well as local business..
- 5) To encourage computer literacy among local citizens.
- 6) To provide educational files for the public.
- 7) To obtain and maintain a presence upon the INTERNET as a resource for education, public service and economic development.

One of the first pieces of information I needed was how many people in our area actually had access to computers. After all, the development of a BBS without users would merely be an exercise in futility. Our local paper, the Valley News Dispatch did a survey in the spring of 1994 that identified almost 25% of the homes in our area equipped with a personal computer of some type. "An American Banker magazine survey found that 18% of American households with checking and savings accounts also have a personal computer. What's even more significant is that 64% of those households reported they are interested in home banking via computer."⁶

Equally important, I needed to know what percentage of those computers surveyed were equipped with modems. And would the same 64% be interested in home banking? That information was difficult to substantiate. I visited many local computer stores asking for this sort of information and there was nothing that could be substantiated. Most stores told me that almost all computers purchased during 1994 were almost exclusively purchased with modems. From this, I surmised that the vast majority of PC owners did not have a modem. This was later confirmed in the March 13, 1995 edition of the USA Today. It noted that 67% of Americans had computers but only 16% had modems.

I needed to find another resource that would tell me the number of potential local users. The obvious decision was to consult with area BBS owners. As I began to inquire, I was amazed that most BBS software came equipped with a great deal of statistical demographic information of its users. The information I found from our areas' largest BBS calculated that the BBS had just over 300 Apollo area users. The median age was 24 years-old.

Having 300 potential users on a BBS was welcome news but I was discouraged that so many users were under 20 years of age and probably would not utilize a banking BBS. I thought it might be worthwhile to solicit the local businesses. I brought the idea of a community BBS to our Chamber of Commerce. As one of the Directors of our Chamber, it was an issue that I could bring to the floor. There was universal support from the Chamber for this idea. In fact, the Chamber voted to supply its events on disk and have them listed on the system.

No one could dispute the importance of such a project in our rural community. The prospect of an information and communication pipeline that could be tapped into by anyone in our community had wonderful potential. The goodwill and positive public relations generated by the bank would be tremendous.

However, how does one quantify goodwill or positive publicity? The impact of money spent for product advertising can usually be measured in some way. The ramifications for money spent on this project would be very difficult to measure. It would be impossible to impress upon my Board of Directors what exactly would be generated for the money spent. This kind of project had never been undertaken by a bank. My Board of Directors is not composed of wide-eyed kids wanting to surf the Internet. The Board is made up of good, conservative, practical business people who were unfamiliar with the terms BBS and Internet. I could not ask them to spend money foolishly on an experiment that could fail.

Instead, I decided to float a trial balloon. I thought that there was no better way to demonstrate the reality of my thesis than to actually do it. After all, anyone could make projections about the future.

If indeed a BBS was considered to be a worthwhile project I had to know its cost to implement. Paying someone with the necessary expertise and knowledge would become very expensive. This project was extremely labor intensive and I knew that there would be many unforeseen glitches. Therefore, the labor would have to come from my volunteer efforts and those of our excellent internal auditor and anyone within the community that wanted to see this project succeed. Surprisingly, there was no shortage of volunteers within the community because even the possibility of bringing this BBS to our rural area was exciting, if not a mission for some.

Our internal auditor was more familiar with BBS's than me. I asked him to find the best available software package that would run a BBS shell. We had a telephone line in our main office that was available because we had recently removed one of our ATM's. My goal was to use an old existing PC, the ATM telephone line and the BBS software to run this entire project. The cost of most BBS software for a single line ran anywhere between \$50 and \$350. That seemed like a reasonable expense to attempt this project.

In order to understand whether commercially-sold BBS software would be something suitable for banking, I had to see if I could master it myself. What one needs to connect to a BBS is any personal computer, a modem and a communication software package. IBM compatibles were recommended to me as the computer of choice. Game machines such as Sega, Nintendo, etc., could not be used to access a BBS although some of these are equipped with modems.

Most BBS's can support a wide range of baud rates. A baud rate is the speed with which data is transmitted. I was fortunate enough to have a 14.4 kbps (kilo-bits per second) modem at work which I used to send my call reports to the FDIC electronically. Most BBS's can support modems ranging from 300 bps (bits per second) to 14.4 (thousand bits per second). The speed of a modem determines how quickly screens appear and update, as well as the time it takes to transfer a file.

Generally, BBS's are driven with colorful menus. However, not all computers can handle color displays. BBS owners take pride in the colorful drawings they create for their menus.

After installing and configuring a modem and communication software, the next step was to dial into a BBS. Most communication packages allow two methods of dialing: manual and directory dialing. With directory dialing one sets up an entry for each site that is called. The package then stores that information into a directory for easy recall. This is best when more than one BBS is called. If the package does not support directory dialing, one is forced to use manual dialing. In that case, the number dialed must be entered each time the communication software is run.

Whatever the dialing method chosen, the modem will attempt to connect to the linking modem at the other end. It is likely that one will hear sounds similar to a phone dialing. After the dialing noise and a few rings, one hears something that sounds like a fax machine receiving an incoming fax. That is the

carrier signal. If these noises are heard, it is a good sign. After a few moments, the noise should cease and an introduction screen usually appears. Here is an actual example from a print screen of a simple BBS:

You have connected to node 1 on Apollo Trust Company

If you are a new user - Welcome!!!

Please make use of your real name on this BBS. Thank you.

What is your first name? Ray
What is your last name? Muth
Looking up your name. Please wait...

Welcome RAY MUTH from The Bank.
Password? [*****]

A series of questions are normally asked on a BBS when you log on for the first time. This provides an excellent database to the BBS operator identifying location, sex, age and interests.

There are a variety of BBS software packages available. To the uninitiated, it is amazing to find out the interest that exists out there for this type of service. BBS software can be easily purchased at any software outlet.

My first and foremost consideration before I even contemplated the feasibility of operating a BBS was system security. Computer security is one of the most critical issues being discussed today particularly in the communications arena. Newspapers and magazines are filled with nightmare stories about hackers and viruses. Hackers are simply people who enjoy playing with a computer, mainly for the challenge and enjoyment of learning all there is to know about a particular machine, operating system, or application. Viruses are programs that infect other programs, and spread themselves from disk to disk or computer to computer. Viruses are designed to cause problems of one type or another.

A virus can not travel by itself. It must be in contact with the computer in some way. I determined that the proposed BBS would have to run on a stand-alone system. In no way could it be attached to the bank's file-server or mainframe despite the numerous assurances I had received in researching this issue.

Our internal auditor did some simple research and concluded that the "Wildcat" BBS software package would be the type that we would run. In his research he noted that the security provisions within the program had never been overcome as the result of a software deficiency or compromise of the program code. Wildcat was deemed the most user friendly and it was also the most widely used in our area. The volunteer help from the community was familiar with Wildcat and that was a big plus. In addition, the Wildcat software would allow us to provide interactive communications between callers, it provided forums and it included files areas for uploading and downloading. In addition, Internet access could somehow run through it.⁷ These were all things consistent with the goals that we wanted to achieve.

Setting up a simple BBS did not appear too complicated for someone familiar with DOS and a little programming. Most BBS software assumes that one has a basic understanding of how to create and use subdirectories, and how to use a text editor to create and modify the AUTOEXEC.BAT and CONFIG.SYS files. I estimated that installing even the simplest BBS software would involve approximately 16 hours of labor.

I learned that there were several considerations that everyone should study before analyzing whether to set up a BBS. The first is the type of computer. The Wildcat BBS had to be run on an IBM compatible 80286 or higher. It required at least 640K of RAM (random access memory) with a minimum of 400K of DOS memory available for the Wildcat software. It also required an 80 column monochrome or color monitor, asynchronous communications (serial port) adapter, AT command set modem, voice grade telephone connection for the modem and a modular telephone cable from outlet to modem. A tape backup of some kind is also preferable.

I assumed that setting up a BBS would be the easy part. Managing the BBS would be a more difficult variable to analyze. I knew that some callers would be experienced while most in our community would probably be novices. I understood that it would be very important to take the time to make the BBS look friendly, yet organized. I also knew that the BBS of tomorrow like our tellers of today could become the only part of our bank that the customer would ever see. Courtesy and professionalism would be essential elements to communicate.

An unknown variable would be estimating the number of callers that would be looking to our bank for help when they ran into problems. I wanted to make the experience as positive as possible for callers, and I knew if we put together a BBS, some sort of user's manual would have to be prepared. One of the goals of this project was to educate the citizenry in computer literacy and this was a very delicate, time-consuming issue to evaluate.

A person who is in charge of running a BBS is commonly known as a system operator or "sysop". A sysop is where questions are ordinarily directed. A sysop needs to take reasonable care to check the system configuration regularly to ensure that people do not have access to parts of the BBS that they should not see. There would be some very routine tasks that a sysop would have to perform including spending a few minutes to answer the mail and customer comments in addition to helping callers who were having difficulty.

Who would be given the task of being the sysop if we undertook this project? I was enthused about this idea so there would not be a problem giving up time to run a BBS. However, I could not do it alone. Fortunately, our internal auditor had an enormous interest in seeing this idea succeed. He volunteered to contribute in this area if we attempted to do it. He understood the time involved and he knew that it could not be "time on the job." I simply could not justify to the board a great deal of work time spent on this experimental project. We had a couple of employees who were computer operators that were likely candidates to volunteer to be sysops as well.

One major benefit was that the bank had an in-house system already. Fortunately, we had very capable personnel familiar with the workings of computers, networks and computer communications. The experience and lessons learned with running bank operations would likely be an excellent resource.

Was it possible to customize the BBS software to run some sort of personal computer home banking program? What first caught my eye when I logged onto an area BBS was the sophistication of games that could be played through the telephone as I sat at home on my computer. It was astounding. I learned that these games were actually distinct and separate programs set up to run through the BBS software. These programs ran through a "door" on the BBS software. As I inquired, our internal auditor pointed out that it was possible to have any program written in a language like COBOL or C to accomplish the task.

I had some experience writing COBOL programs but I did not have the sophistication needed to write something like a home banking program. No one on our staff or in our community had that kind of capability that I could find. I should say that there was no one in our community that I felt comfortable

dealing with this project. This presented a problem.

In addition, there was another problem. Was it possible to run an effective home banking program on a stand-alone system? How could customers access information on their accounts or make transfers from one account to another?

Fortunately, I found someone that performed maintenance on our mainframe who was able to answer these questions for me. It was possible to design a system where account balances could be written out onto a floppy disk or downloaded and then carried over to the stand-alone system. Theoretically, transfers coming over the BBS could then be carried over onto the disk and uploaded back into the mainframe.

How much would a home banking program cost? I proposed this idea to fellow bankers and they had no idea. All of the core-banking software vendors with whom I was familiar with told me that there were no commercial packages available. This was such a unique project that I had a feeling that those were the answers that I would receive. The individual responsible for maintenance on the mainframe quoted me a price of \$2,000 to write a program. He was reliable in the past so I had a good comfort level that he knew what he was talking about. And I knew that I would not be forced to radically alter the computer area.

Another related benefit to having an in-house system was that I was able to consider home computer banking at all. This was complicated further because I did not want the bank's current system corrupted or compromised in any way. This would be an impossible task for banks that use third-party processing since there are not products currently available for this type of service.

I wanted the proposed program to have the future flexibility of giving customers the ability to pay their bills through the system. The very long-term impact of electronic bill payment is that as volume grows, it would relieve the messiest, most burdensome part of transaction processing. Acceptance and proofing of a variety of payments without human involvement would make clean the job of processing account information, and extracting the marketing data.

The last cost consideration was providing Internet access. The Apollo Area Economic Development Council raised \$30,000 to bring in six different consultants from around the US to perform a five-day economic summit. This summit took place in the Fall of 1994. The consultants were to determine what Apollo needed to do to bring jobs to the area. One of the most important points identified was providing residents with affordable access to the Internet.⁸ In their minds, the Internet could bring economic opportunity to residents in their homes.

I had only heard of the Internet when I started to undertake my thesis. I had never been on "it". I had no idea what "it" was. The Internet was nothing more than a collection of computers around the world that were connected or networked together. "Just as the interstate highway system links cities to other cities, so the Internet links thousands of computer networks. The Internet is the mother of all networks."⁹

The Internet allows people to travel to different points of the world through their home computer. Unlike CompuServe and Prodigy, the Internet is not one large facility. The Internet is a voluntary link of computers. Users can jump from one site to another just by pointing their "mouse" in the right direction. Since that was true, was it then possible for Internet users to come into our BBS through the Internet? The answer was "yes". Since that was possible, would it be logical to assume that Internet users could come through our BBS and perform home banking. The astonishing answer to that was "yes, it was possible".

Internet has come a long way in the last few years. It would seem necessary to review a few terms about the Internet before proceeding further. Something called the World-Wide Web was designed to make it easier for users to find and view information. "The Web acts as a menu for pages of text, pictures or sounds. Some of those words or pictures are linked to other pages on the Web, and not necessarily the same computer. The Web is one of the fastest growing parts of the Internet because organizations can make these texts, pictures and sounds available to users. Through a SLIP connection, graphical browsers such as Mosaic and Netscape can view and hear everything on the Web."10 SLIP stands for serial-line Internet-working protocol. To the uninitiated, SLIP is the means through which a home computer actually becomes part of the net. It is currently the best kind of connection, second only to a slightly better version called PPP. PPP stands for point-to-point protocol but many refer to it as a SLIP connection. Mosaic and Netscape are currently free programs that you can obtain through the Internet. These programs allow people to make use of SLIP connections. Businesses set up "home pages" on their system that users can access through these graphical interfaces. Having a home page put on the Web is free.

Currently, Bank of America is advertising and providing information about home computer banking to its customers over the Internet on the Web via a home page. However, transactions are not conducted over the Internet. Through an "800" number California customers can dial into home computer banking and pay bills or see their account balances. The fee for this service is \$14 per month.

At the same time, Wells Fargo is advertising on an Internet home page as well. They only offer telephone banking. There is no doubt that users of the future will be able to conduct banking transactions through the Internet but this will likely be through one large electronic service provider like MAC.

I thought that I had stumbled onto something significant if our community bank could maintain a home page like Wells Fargo or Bank of America. Many banks were on the Internet but no banks in the US were providing home computer banking through it. And it should be noted that Bank of America and Wells Fargo were not Internet providers. They were merely renting space from another provider. I thought there was a chance that we could be both access providers and home computer banking providers.

The possibility of a community bank setting up its own unique site would allow customers a distinct service. If an Internet user was able to point his/her "mouse" to a bank like Apollo Trust Company, it would be much more than a novelty. It would be a way that community banks could creatively lure not only its hometown customers into its bank, but it could also lure the world into its facility. The BBS could be constructed to have a "front door" which would be local phone calls and a "back door" which would be incoming telnet users through other sites on the Internet.

Understanding how to set up an Internet site is quite a chore. I had to educate myself in the way it worked if I was going to recommend this idea. Every computer connected to the Internet has its own address. "There are two main types of addresses on the Internet, IP addresses and domain names. Each computer that uses the Transmission Control Protocol/Internet Protocol (TCP/IP) is distinguished from other computers on the Internet by a unique IP address."11

The other type of address is referred to as the domain name. Because IP numeric addresses were difficult to remember, a text system was developed that allowed providers to choose a distinct name.

People use the Internet for two reasons. They either want to find, view, retrieve or send information. Or they want to communicate. There are currently four main components that should be made available to its users if someone is considering providing Internet access. These four components are: Telnet, FTP, E-mail services and Usenet News.

Telnet allows you to log onto another computer through the Internet. You find your way to another computer by putting in an address as discussed above. Telnet is very easy to use and there are literally thousands of telnet sites.

FTP stands for file transfer protocol. This is a fancy name for the procedure that one uses to upload or download files onto the computer through the Internet. Using FTP requires a fair knowledge of Unix commands. Unix is simply the operating system from which the Internet runs.

The most popular way to communicate through the Internet is with electronic mail. When I saw my first e-mail address, it looked quite intimidating. But when I saw the incredible ability to communicate with anyone around the world, it became less daunting because I eagerly wanted to learn. Everyone on the Internet usually has an e-mail address. The amazing thing about e-mail on the Internet is that it reaches other users around the world in only a few minutes.

And the last, though not least important service a provider should give to a user is the Usenet news groups. Usenet news is the electronic bulletin board of the Internet. Users have the ability to post messages to over 5,000 newsgroups or read what others have posted. Unlike e-mail, newsgroup messages are public, not private. Newsgroups are not limited to personal messages. Some newsgroups transmit news from the Associated Press or Reuters news services. There are other newsgroups that transmit information from less conventional news services.¹²

Those four services usually come with something called a shell account. Shell accounts are what most people want when they want Internet access. Some Internet access providers offer menu-based connections. These are easier to use than shell accounts but they are less versatile. Menu-based accounts can sometimes limit the options available. Delphi and BIX both offer menu-based access to the Internet. The large on-line services like Prodigy and CompuServe offer e-mail only which limits users to sending and receiving mail on the Internet.¹³

Having acquired a basic understanding of the Internet, the obvious question was "could a bank become an access provider?" Were there Internet laws governing who could or could not be a part of the Internet? What was the cost to provide access if this were possible?

To my surprise, I learned that anyone could become an access provider. There were many companies out there selling the technology to become access providers. I determined that choosing one that was reliable would be the key. In the western Pennsylvania area, there was a company that provided service for Carnegie Mellon University and the University of Pittsburgh. That seemed to be a place that would not be going away soon. The cost to get hooked up to this system excluding the telephone connection was \$5,200. There were cheaper points of entry but the reliability factor was my great concern.

Becoming an Internet provider means that a very large telephone line has to be run from a site to another site on the loop. Most sites have either a 56K or a T1 line run. These are easily the most popular lines. The difference between the two is bandwidth size. A 56K line can handle 8 callers comfortably through the Internet while a T1 line might be able to accommodate 150 callers easily. The cost of a 56K line run to our site was \$300 per month. The cost of the T1 was \$1,200 per month.

Thus I returned to my original question. Could a community bank develop a cost-effective electronic bulletin board system that could provide its rural community with home banking, interactive communications, a forum for community information, educational files and Internet access? Could a bank BBS be effective with only some of these options?

Recommendation and Implementation

I believed that a community bank with an in-house data-processing system and a talented staff could not only develop a cost-effective electronic bulletin board but could develop a system that would be a tremendous marketing tool for the bank and encourage computer literacy among its local citizens.

Since I had committed myself to this thesis, I had to read a great deal about BBS's and the Internet regardless of whether we actually implemented a bank BBS or not. It wasn't enough to merely study these ideas though. Reading about the Internet and getting an impression of what it was, was very different than using it for the first time. Both a BBS and the Internet are phenomena that genuinely needs to be experienced in order to fully understand and then explain.

A major problem for this thesis was that this was an idea that had never been tried by any bank, let alone a community bank. There were no blueprints. It would have been very beneficial to draw on the experiences of a bank that had done this before. That notwithstanding, I became enchanted with this idea the first time I dialed into a local BBS designed for kids, nine months ago. When I logged on, my eyes saw a world of fun and games. But my mind visualized a possibility for our bank.

To see if this idea had any merit, I went out into the community and simply asked. It was May of 1994 when I attended the Alle-Kiski computer club meeting. At the end of the meeting I explained my thesis. There was enthusiastic support. After the meeting, a few people asked if they could volunteer for the project. One of the volunteers ran his own BBS out of his home that was dedicated to games and his was the first BBS that I ever saw.

I decided to experiment. Our internal auditor decided on the Wildcat BBS software for \$150. He also recommended a program called "Desqview" that would allow the BBS machine to run more than one application at the same time. So I ordered the software and we dusted off an old personal computer that was no longer in service. We plugged a telephone line into the modem and we were ready to begin.

We put together the BBS over a weekend in late May. It really was not that difficult for us. I wanted new callers to provide me with certain demographic information. To illustrate, the following is an actual print screen of our BBS in May. When someone logs onto the board for the first time these are the questions they see for a caller named "John Doe".

```
What is your first name? John
What is your last name? Doe
Looking up your name. Please wait...
Your name "John Doe" was not found in the user data base.
Is your name spelled correctly [y/N]? Y
```

```
Please select a password? [***** ]
Re-enter password to verify? [***** ]
```

Hello! You are a new user to the system and we want to welcome you. There are many features to discover, so please read the HELP files and experiment with new choices.

Check the Bulletin and Newsletter file for additional information. Welcome to Apollo Trust Company running WILDCAT! Version 4.01 MP. For our BBS records we would like to get some additional information.

Please answer as correctly as possible to enable us to provide

the best service and support possible.

What is your COMPANY name? (leave blank if none)

[Doe Enterprises]

What is your STREET ADDRESS? (line 1 of 2)

[300 Main Street]

What is your STREET ADDRESS? (line 2 of 2)

[]

What is your CITY?

[Apollo]

What is your STATE?

[PA]

What is your ZIP or postal code?

[15613]

What is your COUNTRY?

[USA]

Are you an Apollo Trust Company Customer (Y or N)

[Y]

What is your daytime voice phone number?

[412-999-9999]

You entered 412-999-9999, is this correct?

[Y] - 412-999-9999 is really my home phone number.

[N] - Let me go back and correct it now.

Enter choice? [Y]

What is your BBS or data line phone?

[412-888-8888]

What is your date of birth? (for later verification)

[01/01/70]

Is 01/01/70 your correct date of birth?

[Y] - 01/01/70 is my DOB.

[N] - Let me correct it now.

Enter choice? [Y]

Thanks for taking the time to complete our new user questionnaire.

As you can see, this gave me and continues to give me invaluable customer information about age, sex, location, phone number and computer specifications. Computer specification information was important to me because I needed to understand how to make our BBS fit the needs of our customers. For example, if the majority of users had color monitors, I needed to put together some colorful menus.

This little survey also told me if a user was a bank customer which provided outstanding data in measuring the effectiveness of this idea. It should be pointed out that users answered this survey only once. When users logged onto the system a second time, they went directly into the public use area.

Of course, the BBS had to have something distinctive to offer or people would not call. As previously discussed, I wanted that distinctiveness to be files that promoted the area businesses and volunteer organizations. I also wanted to furnish files that promoted the beauty of the Apollo area. So I collected file information like the Apollo Trust Company annual report, the Chamber events and Leechburg School District Board minutes. Anything publicly available on disk was a candidate for the BBS.

After only a few weeks, I had approximately 50 area people logged onto our experimental system. From the survey information I determined that callers were mostly between the ages of 18-35. Most callers were male. Over 80% were our customers, and almost all had color monitors. The callers eagerly downloaded the information available about our area. The software kept track of which files were downloaded, who downloaded files and when they were downloaded.

The initial results were better than I had anticipated. But there was a lot of work that needed to be done. Next I wanted to market the bank. Our internal auditor compiled a series of screens that displayed the banks interest rates.

The experiment was beginning to succeed. Customers and non-customers were curiously calling into our new BBS. By July of 1994, two months after the BBS was up and running, the demand exceeded one telephone line. I decided to put in another telephone line.

Also in July, our internal auditor suggested purchasing and installing a satellite dish on the roof of the bank to receive files called "shareware" and "freeware" that were being distributed by an innovative company. Shareware and freeware files were files that were attractive to the BBS subculture. Shareware is software that can typically be tried for free by a user and if it is found to be of use then he/she sends the required fee to the vendor. Freeware is software that a user may use without paying a fee. For the cost of \$30/month, we could provide our customers with all these files plus an electronic version of the USA Today.

I took the auditor's suggestion and with the approval of our President, we installed the dish. The response was excellent. It gave the community one more reason to call our BBS. Literally hundreds of new files were transmitted onto our BBS each week through the dish. The satellite transmissions were an amazing new technological application.

As time marched forward, local high school students began to volunteer to help with the project. A 14 year-old wrote a loan application program that brought in an \$80,000 mortgage. A 17 year-old wrote a USA Today menu driven reader so that information flowed easily. Another 17 year-old wrote an amortization and payment calculation program. Each of these could be accessed through the BBS.

At the end of July of 1994, we contracted out the work to write the home banking program. By the end of August we added this feature to the BBS. This popular application allowed the customer to look at any of his/her deposit account information including a computer generated statement that detailed all the checks that had been cleared since the last mailed statement. It also allowed customers to make transfers between one account and the other. Security was strict for this procedure. A password and a pin number assigned by the bank was required. After three failed attempts, the caller was forced off the entire system.

On August 24, 1994, the American Banker highlighted our BBS in their newspaper. A variety of people were interviewed expressing enthusiasm for the project. The good news for our customers was that all the services on the BBS were not only free, but they could get access with a local phone call. Deborah Williams, a technology analyst at Tower Group of Wellesley, Mass. said, "It sounds like a free CompuServe, in which case it's really more in competition with a paying service."¹⁴

Apollo Trust Company has four branches all within a radius of five miles. As one might expect, we had few customers outside that radius. By September of 1994, we had over 300 registered users on our BBS of which 270 were from the local community. Our internal auditor and I had conducted house to house combat in installing modems and software for interested citizens.

With home banking, I knew that our customer base would have the potential to go beyond our physical branch locations. We had done no advertising of our BBS. The marketing campaign for this project was done simply by word-of-mouth. We called the BBS, the Apollo Trust Company electronic bulletin board system. That was a mouthful and intimidating to the uninitiated. Our outside marketing firm suggested that we simply call the system the "B". They suggested a newspaper advertisement in the Fall of 1994. We advertised the "B" and the response increased our user base by one-third.

By October of 1994, I had enough feedback to know that the BBS experiment was a good success. It was now part of my daily wake-up routine to log onto the BBS from home and answer customer questions or requests. I was even fielding questions seeking financial advice.

There was one more challenge to consider and that was access to the Internet. As previously discussed, rural communities were and are being left off the information superhighway. If access can be obtained from these areas, it is almost always with a long-distance call and that becomes expensive, if not prohibitive for most. Apollo is located in an economically challenged area. The average citizen does all he/she can to make ends meet.

I knew that the best way to become an Internet provider was to duplicate the way the Pittsburgh universities were providing access to its students. For approximately \$5,200 for access, \$4,000 a year in phone service and \$8,000 in additional computer equipment, we could tap into the same access as Carnegie Mellon and Pitt universities. Apollo Trust Company could become the only public access provider in Armstrong and Westmoreland counties. But would all that be beneficial to the bank? And would the bank be able to recover that cost.

In November of 1994, the Board of Directors approved a one year trial, allowing the bank to become an Internet provider. After a month of hard work from the bank and area volunteers, we managed to put together a system that allowed users to have Internet access. Even more satisfying, Internet users from around the world could come into our BBS and read what the Apollo region had to offer. In fact, home banking could be done from a local call in New Zealand if the New Zealander had Internet access. In addition, one of our fine computer people was able to convince Carnegie Mellon University to donate access to their newsgroups so that people in Apollo could have access to this important service.

Today

As an aside, I chose the domain name "apollotrust.com" and I called our E-mail server "bankswith". What this meant was that anyone that had access through us paid for an E-mail address that read in part @bankswith.apollotrust.com. For example, my address is raymuth@bankswith.apollotrust.com. Whether users really banked with us or not, it sure looked like they did, and each address traveled around the world to wherever the user went.

To date, the bank has received excellent publicity for its ingenuity. Armstrong County is currently in discussion with the bank about subsidizing the effort so that access can be free to all the citizens in the county. I am currently putting together a "home page" for the Apollo area that includes digitized pictures of the bank and the area. This means that someone sitting in Australia can read, see and hear what our proud community has to offer.

High school students have continued to contribute their enthusiastic active support. Today a 15 year-old is in charge of maintaining the file areas and a 14 year-old walks around from local business to local business.

I am now undertaking an ambitious home page project with all the Christian churches of the towns of Leechburg, Vandergrift and Apollo. This project also involves the University of Pittsburgh and the Pittsburgh Theological Seminary. The possibilities with the Internet seem to only be limited by the boundaries of the imagination.

One of the surprises of this undertaking was the interest from the college community. As word spread about a little bank providing access to its citizens, I began to get E-mail message after E-mail message from professor after professor not only praising our effort but also offering their help.

Yes, a community bank could utilize an electronic bulletin board system. In fact, one day, it may become a necessity. It has provided Apollo Trust Company with a competitive edge, a challenging and creative banking tool and educational and economic opportunity for its customers.

Footnotes

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