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**Strong, Rudolph, E. *Video Banking ICT Adoption***

**Abstract**

In this research report I will provide a literature review of video banking ICT technologies and provide a critical analysis of factors that contribute to the success and failure of implementing a widely consumer accepted solution. Research analysis will be utilized to present a historical perspective of past technology, evaluate current technologies and review future trends and opportunities for large scale successful implementations.

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## Chapter I: Introduction

Information Communication Technology (ICT) has played an important role in the financial industry. ICT advancements have made banking Alternate Delivery Channels (ADC) such as Automated Teller Machine (ATM), Telephone Banking, Online Banking, Mobile Banking and Social Media Banking possible. ADCs are important because they lower the cost per transaction often used in calculating return on investments and they can also provide a competitive edge in the market place. Since the invention and successful implementation of the ATM banks have been looking for the next big ADC opportunity.

Many financial industry professional once believed that Video Banking would be the next big ADC to revolutionize the banking industry. In November 1993 it was reported in the Des Moines Business Record that the primary ADC opportunity expressed by Kent Frankenfeld, vice president of technology and operations for Midland Savings Bank, was that in the future a bank customer could use a video kiosk to calculate amortization rates for mortgages and then get information on a bank's mortgage program (Chase, 1993, para. 1). Midland bank also piloted a video kiosk that provided information on new cars and car loans at three of its locations. Frankenfeld stated that “customer response to the car loan kiosk has been mixed” (as cited in Chase, 1993, p. 12) and Midland officials seem to indicate that the low consumer acceptance to their video solutions were due to ineffective marketing, and poor choices made on kiosk locations (Chase, 1993, para. 12).

The ADC video technology discussion and pilot implementation at Midland bank was focused on interactive-video kiosks and interactive television technology. In the Midland pilot customer response to the technology was reported by Midland officials to have yielded mixed results. Midland bank officials felt that product offerings, marketing and location may have

played a significant role in the low customer demand for their solution but they did not indicate if they had also considered whether failed technology was a factor as well in the low consumer acceptance. Since the Midland pilot in 1993 there have been many developments in video kiosk and television ICT but neither technology has yet to yield significant improvements in the consumer banking experience.

In 2012 some industry analysts still predict that Video Banking is the next big ADC that will capture the consumer hearts and minds but the technology has yet to obtain widespread diffusion (“Video banking are you ready”, n.d.). “Banks that have not organized themselves for video processes will struggle to keep up with the rapid demand for change” (as cited in “Video banking are you ready”, n.d., p. 1 ). ICT implementers and banking professional are still searching for the right video banking solution that will revolutionize the next big ADC expansion.

In order for Video Banking ADCs to be a success banks must first identify the problems that have impeded its widespread proliferation and then evaluate current technologies and market opportunities. Some of the primary ancillary issues and concerns that will also need to be considered with a video banking solutions would be that they often require a substantial upfront investment in ICT infrastructure, changes in policies and procedures may be needed, dedicated staff resources may be required, and regulatory issues and concerns may also need to be addressed.

Time to market planning is also important in any evaluation and implementation of new technologies. If the solution is implemented too early before an organization’s customer base is ready to accept this technology any expected or planned achievements resulting from project implementation may never materialize.

## **Statement of the Problem**

The main problem today when considering a video banking implementation is that there exist no clear and proven path to a successful widespread consumer accepted video banking solution. Video Banking solutions have been talked about for over a decade but no bank or ICT implementer has been able to solve the problem of selling this technology to the masses.

## **Purpose of the Study**

The purpose of this research paper is to provide research data of past video banking implementations and collect consumer and industry data on factors that contribute to the consumer acceptance of video banking technology. The goal will be to identify the problems with implementing video banking ICT technology and provide data that will assist bank managers and executives with evaluating the business case on if video banking ICT will yield a successful implementation and deliver a strong ROI. For banking professionals to capitalize on market opportunities they must be able to evaluate ICT technologies and determine if the implementation of the technology will yield a cost effective long term return on investment (ROI) for their organization.

## **Definition of Term**

**ICT.** ICT as defined by the World Bank Group consists of hardware, software, networks, and media for collection, storage, processing, transmission, and presentation of information in voice, data, text, or images ("Information and communication," 2003, p. 3).

**Video banking.** Video banking is a term used for performing banking transactions or professional banking consultations via a remote video connection. Video banking can be performed via purpose built banking transaction machines (similar to an Automated teller machine), or via a videoconference enabled bank branch (Video banking, n.d, para. 1)

**Videotex.** Videotex is a two-way text and graphics service providing a variety of computerized data bases accessed over phone lines by a personal computer or via a separate coaxial cable by a terminal that attaches to the TV set (Allen, n.d., para. 12)

## **Chapter II: Literature Review**

The main problem today when considering a video banking implementation is that there exist no clear and proven path to a successful widespread consumer accepted video banking solution. Video Banking solutions have been talked about for over a decade but no bank or ICT implementer has been able to solve the problem of selling this technology to the masses. The literature review of ICT video banking technology will explore the historical significance of relevant video banking solutions and implementations. As part of this review another additional primary goal will be to identify key components of video technology evolution and highlight past and current important achievements and challenges that may prove to be critical contributing factors in the success or failure of modern day large scale video banking implementations.

### **Video Banking History**

In the early 1980s video banking was loosely defined as banking at home with a personal computer. At the 1984 Video Banking I, American Bankers Association's (ABA) home information and financial services symposium, financial industry analyst and professionals expressed early concerns about the industry's ability to implement a video banking solution ("Are banks really," 1984). Participants at the 1984 symposium also voiced their beliefs that if they could successfully implement video banking it would revolutionize the financial industry by reducing transaction costs and eliminating significant amounts of paper handling that was currently required to complete many financial transactions. CSP International's Jane Henry suggested the following:

Banks could save \$0.50 per check processing transaction and that the greatest potential for cost savings from video banking would be in switching the paper-based loan

application process from branches to home terminals, which would bring a 90% reduction from current cost levels ("Are banks really," 1984, p. 75).

Videotex technology was prominent in the early 1980s and it involved ICT technologies that provided interactive banking services in text and high-quality graphics. Videotex banking services received and processed input from the customer. The services were delivered to customers over the phone line and used a television equipped with a set top box, a personal computer, or a proprietary terminal (Shapiro, 1999). Videotex solutions were used in the United States and France but these systems were proprietary systems and with no established industry standards each implementer developed their own version of how a videotex banking solution would work.

**Early implementers.** One of the early videotex banking solutions implemented was the Pronto system. Pronto was created in the mid-1980s in a joint venture by Chemical Bank (now Chase Bank), American Telephone and Telegraph (A.T. &T), and Time Inc. The primary stated objectives of the joint venture was to process electronic bill payments for merchants who participated in their system and allow bank customers to transfer funds between accounts, reconcile their checking accounts and view account balances (Sloane, 1989). In Sloane 1989 some Industry analysts and banking professionals at the time expressed hope that videotex technology would be the foundation of successful home banking initiatives and would eventually make paper obsolete. In addition to the pronto systems other banks and ICT implementers also ventured into this technology.

Bank One Applause video banking system technology worked by allowing the Bank One customer to leave instructions or get information from the Dallas-based Video Financial Services (VFS) via CompuServe's network ("When Video Banking", 1986). At night, VFS would

transmit the data to Bank One and each morning, Bank One sent updated balance information to the VFS computer. Bank One did not charge users of its Applause video banking system, but customers had to pay a \$4.50-per-hour line charge to CompuServe (“When Video Banking”, 1986). “When Video Banking” 1986 found that in the 1980s video banking solutions were, in hindsight, seen as costly and non-revenue generating endeavors, based on this finding one could conclude that the \$4.50 per line charge along with the high cost of personal computers and dumb terminal hardware at the time may have proven to be a detriment to the adoption of video solutions. Nevertheless, three other notable videotex ventures also emerged in this era; Viewtron, Knight-Ridder's videotex effort in Florida; Gateway, a Times Mirror effort in Southern California; and Keyfax, a Chicago joint venture sponsored by Honeywell and Centel (“When Video Banking”, 1986). Telecom companies and Banks were the early dominate players in producing video banking solutions and often formed joint ventures in an effort to find a niche market that would accept this new technology.

No dominant video banking solution emerged out of the early adopters in the 1980s and in the 1990s others began to also try their hand at video banking implementations. In 1997 PictureTel Corporation launched a video conferencing system that allowed customers to have a face-to-face conversation with bank employees (Gore, 1997). PictureTel officials also were reported as stating that video call centers will become more popular as banks begin to use more video-enabled technology to serve customers. Pat Manion, first vice president of direct banking at Peoples Bank, Bridgeport, Connecticut stated at the time that “With video banking, we can bring our expertise to our customers when they want” (Gore, 1997, para. 3). Peoples Bank placed PC’s in branch locations in an isolated area away from the teller line that allowed their

customers to use video technology to talk with bank staff, while still being able to open new accounts or apply for loans.

Diebold Corporation a longtime provider of ATM hardware and software solutions also began to explore video banking technology implementations in the 90s. In 1998 Johns Hopkins Federal Credit Union (JHFCU) implemented for their customers Diebold's teller-assisted walk-up banking RemoteTeller System (RTS) (Diebold, 1999). The RTS system was marketed as a transaction delivery system that could increase productivity, improve security, and reduce the amount of space required for teller-assisted transactions. JHFCU placed eight RTS units in a new branch location instead of the traditional lobby teller counter and Diebold still offers a version of this system for sale today (Damiano, 2008).

In addition to the joint venture video banking efforts attempted by Diebold/JHFCU, and the PictureTel /Peoples Bank implementation, PictureTel also partnered with other industry professionals in a joint effort (Kiesnoski, 1998). Old National had spent time over the past two decades watching the advancements in video banking technologies and decided in 1998 that the time was right to implement video banking in their organization. In May of 1998, Old National Bank of Evansville, IN., implemented a PictureTel based video banking system designed by Zibex Corporation. The Zibex system used video technology from PictureTel, paired it with a pneumatic tube-based video teller solution from Diebold. Old National Bank installed the system in a shopping mall with the stated goal of having a full-service bank at the mall location (Kiesnoski, 1998).

Webster Bank's also worked with Zibex to implement their video teller machine (VTM) as part of its planned branch expansion into both grocery stores and shopping malls (Cohen, 1998). Cohen 1998 found that banks were beginning to see Video banking as a viable alternative

to traditional expansion initiatives and were hoping to capitalize on their expansion opportunities by utilizing new video ICT. After customers had completed and signed a new account application, the Webster bank VTM implementation allowed the customers to scan the form to remote bank staffed at mall locations (Cohen, 1998). In order to verify identity, the customer would also scan a copy of their driver's license. The consumer could fund the new account opening by depositing cash, credit card payment, or with a check (Cohen, 1998). The Zibex VTM solution certainly allowed and offered a full set of the routine and common bank transactions that most consumers would normally accomplish at the teller line. If Webster Bank's mass consumer adoption and diffusion rates of video banking were to be achieved, they would realize a real return on investment (ROI) on their branch expansion goals and objectives. Dawn Harpin Webster Bank's vice president of technology development for direct banking stated that "the VTM opened more than 300 new accounts in its first month at the mall" (Cohen, 1998, para. 6). The ability to open a significant number of new accounts in new markets utilizing a lower cost channel would be a win for any bank. The ability to also move other transactions and processes to the video channel was also an attractive feature that lured bankers to this new technology.

Customer service initiatives soon led others to try out video banking solutions and in 1999 Peoples First Community Bank (PFCB) also installed Zibex Corporation's video banking solution (Amato-McCoy, 1999). PFCB wanted to shorten lines at their teller window and improve customer convenience so they implemented the Zibex solution. The PFCB implementation also set out to prove that video banking in smaller non-traditional bank locations such as in a mall or retail store would prove to be a more successful low profile and low cost alternative than establishing a new traditional brick and mortar bank branch. An Internet front-

end on the system also enabled their customers to log on to the bank's web site to conduct other bank transactions. At the video banking kiosk, customers could open checking and savings accounts, get CDs and apply for loans, debit cards and credit cards (Amato-McCoy, 1999). PFCB customers used a scanner to duplicate and transmit required documentation and if customers needed additional help from bank employees, they would then need to press the Video Call Button to receive traditional face-to-face service.

The Zibex solution of the late 1990s proved to be a popular option for banks seeking to capitalize on this new technology. Tri Counties Bank of Chico, CA installed Zibex video banking units in Raley's Supermarket and as cited in Amato-McCoy 1999, Addison Woods, chief operating officer of Zibex also expressed much like Webster Bank executives that the expectation would be that video banking system could yield up to 300 new accounts each month (Amato-McCoy, 1999). One of the primary goals of the Zibex system was to eliminating traditional brick and mortar branch costs as a way to capture ROI with video banking ICT implementations (Cohen, 1998, para. 8). The Zibex systems seemed to have been one of the early video banking system to provide potential to utilize new video ICT to develop a successful ADC that would deliver product and services to bank customers. Other banks that implemented the Zibex's video banking system included EAB, Citizens Bank, Frost Bank and National City Bank (Amato-McCoy, 1999).

**Early technology.** The early Video Banking systems of the 1980s used dial-up modem technology and thus had all the advantages and disadvantages associated with a dial-up solution. The Pronto dial-up video banking solution allowed customers to send email to other Pronto users, and electronic statements along with monthly printed statements that were made available for customer retrieval (Burns, 1989). Privacy and security was addressed by allowing each

family member to have their own personal system access code. The Pronto software was a multi-featured financial management system that also provided screens with forms for budgets and enable users to produce and maintain tax records (Burns, 1989).

The Viewtron Knight-Ridder system was a joint venture between AT & T Knight Ridder a newspaper publishing firm (“The Viewtron System”, 2012). The system was designed to run on a television when customers connected the Sceptre terminal and a modem to their phone line to use a teletext graphical interface with color graphics. In addition to offering video banking Sceptre users could also access current news stories and email.

The Diebold RTS system technology was a walk-up kiosk type system that was designed to operate like a drive-through teller window (Diebold, 1999). The RTS had a two-way audio and video connection, cameras, microphones, monitors, and speaker or a handset. Documents were exchanged between tellers and customers using a pneumatic tube.

The Zibex Video Banking System videoconferencing technology of the 1990s was an improvement on the ICT technology used in the Pronto system as it was comprised of a Video Teller Machine (VTM) and a Video Banker Workstation (VBW). The system supported full-motion video and utilized faster TCP/IP-based transmission to enable voice, data and video communication (Amato-McCoy, 1999). The employee VBW contained a computer, video camera, printer and speakerphone or headset. Zibex’s VBW enables the bank employee to communicate via video with the customer and was linked to the bank's back-office systems for data input and retrieval.

The Zibex VTM customer kiosk utilized a Windows 3.1 based touchscreen that allowed the consumer to connect to the bank employees at a distant remote location (Kiesnoski, 1998). The VTM kiosk has a touchscreen, a video camera, a microphone, privacy handsets, a printer

and a scanner. The technology was thought of as innovative for its time as it provided customers with an alternative to standing in long teller lines (Kiesnoski, 1998). Since Windows 95 was on the market the choice to use the older Windows 3.1 technology may have been made due to the level of experience and confidence the developers and designers may have had with Win 3.1 operating system versus implementing a new hardware and software solution on the newer Win 95 OS. Considering the initial \$50,000 investment banks would need to deploy one set of the Zibex VTM and VBW hardware and software video banking solution, most likely Zibex developers did not want to also have to deal with the nuances of a new operating system while piloting new and emerging video banking integrated solutions and technology (Cohen, 1998).

**Early challenges.** One of the early challenges of implementing a video banking solution was the concern that back office processes were still too manual and laborious to keep pace with a large influx of customers using front-end video banking systems. Mark Holthouse, vice-president and product manager for Chemical Bank's Pronto video-banking system, stated at the 1984 ABA symposium that "it's an onerous task to back out a video banking payment because of insufficient funds once the payment has gone to the merchant" ("Are banks really," 1984, p. 75). None of the research found clearly identifies how any of the early systems attempted to address this challenge and little is said about seamless integration with the core banking systems often used and responsible for conducting, securing, documenting and tracking the actual consumer bank transaction.

Security concerns were very prevalent in the early days of computer based home and video banking solutions and in an effort to address security concerns Chemical Bank implemented several safe guards into their solution. In the Pronto system the safe guards included having terminal identification embedded in the software, household identification that

must be entered when signing onto the system, each user had a "handle" or what we would call today a user name or "userid", and a personal identification code was required to access the system ("Are banks really," 1984). Regardless of the thoughtful features, functions and technological efforts put into the Pronto solution to attract consumers, and the millions of dollars reported that Chemical Bank spent to develop the Pronto system; by 1989 Chemical Bank's Pronto video-banking system was slated for removal due to low customer acceptance (Sloane, 1989).

The AT &T Knight Ridder Viewtron Sceptre system also offered several different types of features and services in addition to video banking but the service was slow and expensive with a high price terminal and it also required monthly and hourly fees to deliver a suitable ROI ("The Viewtron System", 2012). In 1986 the system was pulled from the market due to low consumer acceptance.

In the early 1980s the prevailing thought among many financial industry analysts was that home banking or video banking would become a vastly acceptable way for consumers to conduct bank transactions and videotex technology was the ICT to make it all happen. By the late 1980s some began to realize that the proliferation of home computers had not yet materialized and video banking solutions were not meeting the expectations of bank and technology professionals. Eileen McNamara Raisch, the consumer laboratory director for A.T. &T stated that "The acceptance was fairly low" among bank customers in the target market, the market for videotex services never seemed to materialize the way we envisioned" (Sloane, 1982, para. 5). Sloane 1982 also found that in the 1980s computer banking had no options for a customer to get cash or anyway to deposit cash or checks which also contributed to the low customer adoption of the technology (Sloane, 1982).

William Cornfield, of Pronto, maintains that the industry lost sight of the fact that it had to create a market for the product. "When video banking didn't take off as quickly as originally predicted, it was labeled a failure" ("When Video Banking", 1986). Cornfield may have had a point about technology and market timing since Home Banking did eventually evolve into Online Banking, which today is rather popular as the technology improved and the diffusion of computer based ICT became more immersed into modern society.

By the late 1990s the Zibex system had begun to also fail to meet previous industry expectations. Pamela Schneider, retail delivery systems manager at Old National Bank found that limitations of the Windows 3.1 operating system and technical challenges with the telecommunications vendor's hardware were contributing factors as to why their Zibex video banking implementation was problematic (Kiesnoski, 1998). Bandwidth infrastructure problems, numerous shutdowns, lockups and failures prevented moving forward with a widespread implementation. Some research suggests that Zibex was planning on upgrading their system but a Win95 version seems to never have materialized (Kiesnoski, 1998). Schnieder stated that "What we found out too late was that we were running the Zibex system through our network and because the video banker is running on Windows 3.1, it just kept crashing," (Kiesnoski, 1998, para. 8). Despite all the glowing analysis and industry expectations and after 20 years of piloting various video banking solutions diffusion of this new ICT technology was unable to effectively overcome the consumer acceptance barriers.

**Initial consumer acceptance.** Early video banking implementers understood that in addition to providing a solution that was technically capable of conducting banking transaction they would also need to address consumer acceptance issues and concerns with using new technology. Shapiro 1999 states that for videotex solutions to succeed they will need "open

standards of the system that gives both consumers and banks the certainty that they will not be tied to one company, will not be left with unusable systems, and will have access to a multitude of services” (p. 17). Financial institutions in the 1980s and 1990s that implemented video banking solutions tried to entice consumers with feature rich systems that could accomplish some of the most common banking transaction conducted at a traditional teller window.

Webster bank wanted a system they could build on and that made their customers feel comfortable with video banking technology and addressed any privacy concerns (Harpin, 1999). They also emphasize the importance of implementing a user friendly system that would not intimidate the consumer. Ultimately Webster chose the Zibex system and by locating the system in high traffic convenient retail or business locations it also offered customer advantages in that bank staff did not have to be physically located close to the kiosks to meet their customer needs (Harpin, 1999). The Zibex feature rich system was capable of handling complete transactions as it was equipped with a full set of peripherals such as a document and driver's license scanner, credit card and bankcard reader, printer for checks and other documents, and an ATM card or bankcard dispenser.

Although most of the early video banking solutions could effectively accomplish the task they were designed to do the proprietary nature of the early solutions was one of the aspects that seem to may have contributed to their downfall. Often with early ICT implementations many separate vendors latched on to the underlying concept and then proceed down the road of their own technical implementation in an effort to achieve their own individual goals and objectives. Lack of standards, consistency, and familiarity with a new emerging technology can sometimes make it difficult for society as a whole to choose which one is best. Proprietary system utilized by few can also be costly to acquire and maintain which can also be a determinant to widespread

consumer acceptance. Some industry professionals state that they have learned from the mistakes they made. "When Video Banking", 1986 states that Roderick Heasley, a Banc One Assistant Vice President points to the AT & T Knight-Ridder system as an example of video banking technology being too expensive at the time to achieve mass consumer adoption. The Knight Ridder system required a Sceptre terminal that customer had to purchase and Heasley stated that the "Sceptre cost \$600, it was too expensive" (as cited in "When Video Banking", 1986, p. 178). The fact that Sceptre offered color graphics as part of its system features turned out to be another error early implementers made as they assumed that customers wanted a system with color graphics. The technology at the time utilized in the dial-up transmission protocol needed to deliver color but it was slow and added time and cost to the user experience. As cited in "When Video Banking", 1986, consultant Gary Arlen states that "The system actually drew a check on the screen for the user to fill in, but people didn't want to wait for the screen to fill in" (When Video Banking", 1986, p. 176).

"When Video Banking" 1986 found that the technology offered in the early systems has proven to be one of the problems that contributed to low consumer acceptance (When Video Banking", 1986). In addition to technology issues banks may have also failed to provide the right product and services via their new alternate channel or the marketing efforts may have been misguided and not properly focused on the products. Scott Clyde, manager of financial services for CompuServe, stated that the reason banks failed to deliver on video banking technology was that "the problem was that a technology, not a product, was being sold and that for banks to successfully sell video banking, they must concentrate only on the segment of the market that a service of this sort appeals to" ("When Video Banking", 1986, p. 176). After years of unsuccessful video banking implementations some industry analyst began to lose faith in the

ability for this new technology to deliver a ROI and achieve any significant level of penetration into the consumer banking market. As cited in Cohen, 1998, Martin Molloy, a senior analyst with The Tower Group, Durham, NC, says that while video banking may confer benefits, it will take about five years before this technology sees significant growth among financial institutions (Cohen, 1998, para. 10). Even Molloy's statement may have been overly optimistic as in 2005 there were still no significant successful wide spread implementations of video banking technology.

### **Current Video Banking Technology**

What was perceived as Video Banking or Home Banking in the 1980s eventually evolved into what we consider today as Online Banking. As home PC proliferation became more evident in society and smart phone use begins to penetrate the masses, banking online has become less of a commodity and more of a routine experience for many households in 2012. Paying bills, checking balances, and transferring money between accounts are now considered routine online banking tasks offered by any and all banks seeking to compete in the 21st century.

Video ICT has also improved significantly over the past 20 years. The improvements in bandwidth and transmission media technology now allow for low cost, high speed, high quality video streaming to home PCs and mobile handheld devices. Recent research shows that consumer acceptance of video technology is growing in all areas of video usage. Rainie 2010 found in a Pew survey that:

74% of American adults are internet users and, among those internet users, 23% have participated in video calls, chats, or teleconferences. The survey also found that 85% of American adults have cell phones and, among those cell owners, 7% have used their phones for video calls, chats, or teleconferences. Overall, that means that 19% of

Americans have either used the internet or their cell phone to participate in video calls – and in many cases, people have used both technologies for video chats (Rainie, 2010, p. 3).

Current research indicates that enhancements in video quality ICT and the availability of low cost solutions have contributed to the current expansion of consumer acceptance of video ICT products and services. Hislop & Morland, 2011 in a Cisco sponsored case study state that current video ICT enabled discussions are a cost-effective alternative to traditional face-to-face conversations when used as a tool to engage customer in an effort to improved revenue and achieve customer service goals (Hislop & Morland, 2011). With the proven success of the video ICT some industry analyst are now starting to again predict that opportunities for ROI in Video banking solutions are now available to achieve. Hislop & Morland, 2011 believed that these advancements in high quality, low cost video has again sparked the interest of bank executives as they continue to search for the next big ADC solution. Some financial analyst also predict that in coming years video ADCs will transform the industry by utilizing the channel to give consumers wide spread access to bank subject matter experts thus increasing revenues and lowering cost (Hislop & Morland, 2011 ). Joint ventures are again beginning to spring up between video technology vendors such as Cisco Corporation and financial industry professional both hoping to capitalize on the current growing consumer passion for video technology. Both parties anticipate that they can develop this interest into an eventual widespread consumer acceptance of a modern day video banking implementation.

**Modern implementations.** The video banking modern day definition is usually defined as video systems that allow customers to have a face-to-face conversation with bank professionals. Several banks and technology companies are piloting and using these modern day

Video ICT systems to develop and implement video banking solutions. One present day theory on how banks can capitalize on this opportunity was presented by Hislop & Morland, 2011.

Hislop & Morland, 2011 stated that banks can focus on four major use cases that will provide opportunities to use video banking to transform retail banking: (1) remote adviser, (2) remote private banking, (3) remote concierge, and (4) remote business-to-business (B2B) meetings (Hislop & Morland, 2011). Hislop & Morland, 2011 also concluded that regardless of the area banks will choose to focus their video banking efforts on they will still need a long term strategy as it will still take time for consumers to evolve and adopt video banking solutions.

Some banks and credit unions seem to be focusing their solutions in the areas of remote adviser services while others are also engaged in delivering on a fifth area of opportunity in remote retail banking. Johns Hopkins Federal Credit Union (JHFCU) deployed their first video banking system in 1998 and today still have fully utilizes remote teller systems (RTS) at three of its five locations (Pugh, 2011). JHFCU utilized video banking to improve security in their branches and provide faster transaction to their customers. In March of 2008 at the IBM Innovation Lab in Bari, Italy, IBM unveiled its Interactive Bank Kiosk that allowed for a teller to interact with bank customers at the kiosk via a video monitor (Damiano, 2008). Mid-Hudson Valley Federal Credit Union installed four uGenius video banking Personal Teller Machines (PTM) in its headquarters branch to give customers in their market 24 hour a day service (Wollenhaupt, 2009). While the JHFCU, IBM, and Mid-Hudson systems seem to be an implementation more aligned with the remote retail banking model the Citizen Bank implementation appears to be an effort in the remote advisor market. Citizens Bank currently has 16 branches participating in a video banking pilot that allows their mortgage and wealth management services customers to interact with bank subject matter experts working from

remote locations. As cited in LIBN, 2011, James P. Gaspo, president of Citizens Bank, N.Y., stated that:

We believe this advanced video banking technology brings great value to our customers at participating branches, allowing them to instantly connect live with lending and wealth management specialists in other locations, putting our customers in control of when and how they bank (LIBN, 2011, para. 5).

Other banks that have recently conducted remote adviser branch pilots using desktop videoconferencing solutions include Bank of America Corporation (BAC), HSBC, Umpqua Bank, and Nordic banks Danske and DnB NOR (Hislop & Morland, 2011 ). Banks are beginning to see value in remote banking and remote advisor video ADCs and many bankers are beginning to test this new video ADC with their customer but few have chosen to go all in with a 100% branch penetration strategy in all of their markets. One bold credit union has decided to do just that, Coastal Federal Credit Union.

Coastal Federal Credit Union was the first financial institution in the world to implement video banking in all of their branch locations (Pranger, 2011). Coastal executives state that their video banking strategy has reduced teller staffing needs resulting in over 40% staff reduction. Other benefits they have seen as a result of their video banking strategy include an increase in teller hours by 86%, open 7-7 x 7, branch platform sales increased 49%, teller turnover under 15%, typical customer teller interaction is 1 minute faster and Coastal opened a 300 square foot branch at Lenovo (Outi, Ross, & Calman, 2012). Coastal Federal Credit Union has been able to reduce labor costs by approximately 40% by replacing 100% of their traditional tellers with uGenius video banking Personal Teller machines (PTMs) and moving tellers to a video enabled call center (Pranger, 2011). As cited in Pranger, 2011 Chuck Purvis, COO of Coastal Federal

Credit Union stated "That is the magic of Video Banking," (Pranger, 2011, para. 17). The uGenius technology seemed to be a good fit for the Costal Credit Union business model. The Costal Federal implementation could provide the financial industry with a practical business model to build upon for achieving a wide-spread consumer accepted video banking solutions. By integrating existing video technology seamlessly into banks business processes bank may be able to overcome the slow consumer adoption of the video banking ADC.

**Existing technology.** Several Banks and technology firms are still building and piloting new video banking systems. John Hopkins Federal credit union one of the early adopters in video banking is still using their remote teller systems (RTS) technology today. In today's JHFCU branches employees are able to use the RTS to improve safety and efficiency at the branch. Tellers in a secure back room are able to serve 2 video banking customers simultaneously (Pugh, 2011).

IBM another industry technology leader launched an Interactive bank kiosk in March of 2008. The IBM Self Service Banking Kiosk 1.2 is distributed in the Middle East. Luigi Di Pace, leader of the IBM Innovation Lab describes the IBM Interactive kiosk technology as a webcam set up at a live teller's workspace that connects a teller with a customer at the kiosk (Damiano, 2008). The operator's desktop has a J2EE application installed to remotely control the virtual teller, the audio/video stream and the remote devices (Damiano, 2008). The application runs on the teller's desktop as a toolbar, so the operator could work in their actual banking application thus no custom integration is required with the core banking application.

Cisco Systems, a leader in network infrastructure technology is now using its expertise in video ICT to help banks deliver Video Banking solutions. Citizens Financial Group (CFG) is partnering with Cisco using its Remote Expert solution to enable face-to-face customer

interactions over high definition video. CFG is using Cisco's TelePresence technology to implement a Remote Advisor banking solutions offering remote Subject Matter Expertise (SME) to their customers (Citizens, 2011). CFG is also using Syngrafii Corp.'s LongPen Signature Solution to allow customers to sign documents. LongPen integrates with Cisco technology and supports secure original wet signature document signing. As cited in Citizens 2011, OJ Winge, SVP and GM, Cisco TelePresence Technology Group states that "This solution showcases how immersive Cisco TelePresence experience can play a major role in the future of retail banking by providing customers timely, personalized access to experts who can help them make solid financial decisions" (Citizens, 2011, para. 8).

uGenius Corporation is also a current industry leader in Video Banking Technology. In October 2011, Coastal Federal Credit union used uGenius technology to convert all of their branches to Video Banking Personal Teller Machines (PTM) (Outi et al., 2012). uGenius technology utilizes their proprietary hardware and software solutions to implement their PTS system. The PTS system provides two-way communication between a remote call center teller and the customer while accepting cash, checks, check deposit (Check 21), dispense coins and cash, supports bill pay, account transfer/payments, customer service inquiries, and new account/loan opening and origination. As cited in O'Sullivan, 2011, Jed Taylor, executive vice president for uGenius Technology stated that "The Personal Teller System is the only solution in the marketplace that allows the teller to complete a bank transaction for the consumer" (O'Sullivan, 2011, para. 6). The teller can use the uGenius teller application to take control of the PTM and assist the customer with initiating or completing a transaction.

The uGenius Teller Enterprise application is integrated with the FI's core processing system and manages all transaction data processing between the uGenius system and the core

platform (Wollenhaupt, 2009). Pranger 2011 states that “the uGenius TellerNow! Application is a stand-alone application that enables the same system functionality as the enterprise application. The PTM technology can conduct more than 95% of all traditional teller transactions and allows tellers to be staffed in a safe and centralized video-based call center up to 24 hours a day, 7 days a week” (Pranger, 2011, para.4 ). In Pranger 2001 research by Brigham Young University’s Graduate School of Business shows that “current video banking users have more than a 90% satisfaction and acceptance rate of this new technology” (Pranger, 2011, para. 5).

Although uGenius and Costal Federal Credit Union can point to a wide array of statistics and facts to persuade bank executives to adopt their video banking technology, the proprietary nature of the system design may cause some concern with larger and midsize FI’s. Many larger and midsize organizations have made a considerable investment in their internal IT departments so that they can be able to customize and deliver timely market driven solutions to their customer. As sited in Wollenhaupt 2011, Bob Meara, senior analyst with Celent said:

uGenius delivered on the concept but they didn’t have the credibility and scalability to satisfy large FIs, which buy ATMs by the hundreds, big FIs need suppliers that have a credible track record of scalable delivery for equipment, service and maintenance (Wollenhaupt, 2011, p. 7).

The inability for an organization to adapt a new technology to its particular needs may cause pause in implementing such technology. Even with the proven successes of video banking ICT by established companies like IBM, Cisco, and uGenius challenges to widespread consumer adoption still exist today.

**Current challenges.** Banks in the United States have not had great success with implementing video banking solutions. First American Credit Union in Wisconsin implemented

a remote teller system in 2004 but had to remove it nine months later due to low customer acceptance of the solution (Damiano, 2008). In a 2011 Cisco sponsored case study Hislop & Morland found that banks that implemented Cisco video pilots believed their implementation are successful and have plans for expanding their pilots but other banks have discontinued their efforts to implement a video banking solution because they failed to achieve customer adoption of their solution, or because other projects promised higher ROIs and priorities (Hislop & Morland, 2011).

Although U.S. banks have struggled foreign banks and organizations also have not yet overcome the challenges of widespread video banking consumer adoption. In the United Kingdom HSBC, Barclays, and Nationwide, all tried and experienced failed attempts in selling mortgages through branch-based video links. These attempts were reported as failures due to neither the technology nor the customers being ready to deliver what the consumer wanted (Hislop & Morland, 2011).

ABN AMRO a Netherlands Eindhoven bank branch offered branch and remote experts video services to its customers. The pilot implementation had high goals of becoming the preferred method of banking for consumers but five years later it was still considered as an experimental pilot implementation (“Video Banking”, n.d.). Monabanq bank in France and New England Credit Union (NECU) in Australia have also piloted video banking with no widespread consumer acceptance.

Current literary research seems to support a hypothesis that consumer adoption of Video Banking solutions is not just a U.S. problem and challenges seem to span the globe as consumers regardless of nationality seem to be rejecting this new technology as a banking ADC. Although FIs also have regulatory, risk and compliance concerns about implementing a new video banking

ADC, the primary reason for past failures seems to be the inability to overcome the consumer acceptance challenge. Hislop & Morland, 2011 found that video banking solutions required changes in some current business processes to be successful. They recommended that video banking staff be trained on the technology and how to be prepared and dress professionally to respond to short notice ad-hoc video enabled customer appointments. Hislop & Morland also recommend that banks with video banking solutions coach customers on using the system and provide incentives to encourage them to use the banks new Video ADC (Hislop & Morland, 2011).

**Consumer acceptance today.** Banks have tried different methods to improve video banking consumer acceptance with mixed results. Some have achieved varying levels of success in small deployments while others have failed to meet their goals and objectives. There are several reasons FIs have voiced on why they believe video banking has yet to reach an acceptable level of consumer acceptance. As cited in Damiano 2008, Ariel Bilskey stated that while the First American Credit Union hoped to decrease staffing costs and improve security with their video banking solution, "Our members overwhelmingly wanted the face-to-face teller line back." The system had "too many faults," she says (Damiano, 2008, p. 18).

Johns Hopkins attempted to address member acceptance by promoting the safety and speed of their RTS while emphasizing that the essence of performing the most common transactions remain the same. When JHFCU launched its RTS system in branches locations they offered lunch bags to 100 first-time users and also staffed additional greeters in the branches to help customers come away with a positive user experience (Pugh, 2011). Even faced with some consumer resistance to this new technology as cited in Damiano, 2008 Lynn Gregory, VP of marketing at the credit union stated that the company has installed RemoteTeller stations in two

more branches in August 2007 and “Our customers are very happy with the solution” (Damiano, 2008, p. 18). Three years later Gregory opinion on video banking seems to have not changed much. The JHFCU implementation remained in place and operational in 2011 as credit union officials seem dedicated and invested in the technology and maybe willing to take a long term approach before abandoning their video banking goals and objectives. As cited in Pugh, 2011 Gregory added that the credit union uses focus group to provide valuable feedback used to continuously update the RTS system and that the feedback they receive from members is “almost 100% positive” (Pugh, 2011, para. 12). Gregory also stated that although JHFCU doesn’t have expansions planned in the near future he predicted that any new branches will use RTS technology.

Although JHFCU, Costal Federal Union and a few others may seem to be committed to a long term strategy to video ADC, low consumer acceptance in the financial industry as a whole still remains as a major hurdle to overcome. In the Hislop & Morland, 2011 study, they found that some of the video banking pilots focused too much of their emphasis on the remote advisor business model or on the video technology. They also concluded that running targeted digital media videos in the branch contributed to the increased consumer acceptance of pilots deemed successful (Hislop & Morland, 2011). For banks looking to build on past successes or avoid past failures current trends in video technology may offer some assistance in this area. Banks with new or future pilots could find consumer acceptance hurdles easier to overcome if consumers are already comfortably engaged in interactive video based services utilized successfully in other industries. Usage trends in video ICT are on the rise and even with the history of many past failed attempts usage trends in video banking may also be impacted by the overall advancement being made in video technology.

## **Trends in Video Banking**

The recent mixed results of video banking solutions may be due to as Wollenhaupt, 2009 stated because Video Banking is still in its infancy (Wollenhaupt, 2009). Even though Video Banking may be still in its early stages video ICT has grown over the years and businesses are using more video solutions for meetings and other processes with inexpensive PC video products like Skype. One reason some allude to for the success and popularity of video products like Skype is that the quality of video communications has grown significantly over the last few years. Hislop & Morland, 2011 found that 45 percent of the January 2011 international video calls were being made via video (Hislop & Morland, 2011). Research also shows that as ICT improvement occur in mobile, tablet and PC hardware video usage among consumers is also growing. Analyst predict that this trend will continue over the next 5 years and with this increased consumer acceptance of video technology video banking solutions may begin to take hold with consumers. Juniper Research forecasts that:

The number of mobile video users globally will grow from near zero a few years ago to 29 million by 2015 and newer consumer devices such as the second generation iPad 2 tablet PC with advanced video-calling capabilities will only set video usage and adoption ablaze (Hislop & Morland, 2011).

The question remains can banks ride the wave of consumer video ICT acceptance and capitalize on this enthusiasm and channel it into wide spread video banking ADC acceptance. The future certainly looks promising for opportunities to emerge in video ICT and if banks can develop a solution that meets consumer needs video banking ICT could finally be the big future ADC banks have been looking for since the success of the ATM.

**Technology opportunities.** In the early implementations of video banking banks tried to deliver video content over expensive leased line or slow dial-up 56 kbps phone lines. The quality of the video was poor due to the fact that the infrastructure in-place at that time was not well suited for video transmissions. Today the readily availability of fast broadband connections makes delivery of quality video content affordable. Since 2005 major tech firms such as Apple, Microsoft, Cisco and others all begin launching video based applications and services that were able to take advantage of the advancements made in telecommunications infrastructure (“Video Banking”, n.d.). Programs like iChat, embedded video services in websites, internet based TV, and video conferencing services all contributed to the widespread success we see today in video ICT.

ATM and Kiosk vendors have begun to also take advantage of low cost high speed broadband connections to deliver video services to consumers. Banks looking to spread the risk of a video banking implementation can look to partner with ATM Independent Service Operators (ISO) who have already begun investing and developing video service technologies (Wollenhaupt, 2009). uGenius recently partnered with ATM manufacturer NCR to develop the NCR SelfServ ATM line in to a video banking solution using uGenius “Interactive Teller” technology. As cited in Wollenhaupt 2009, Jed Taylor, executive vice president for uGenius Technology stated that “We will have full ATM and PTM functionality combined into one hardware and software package” (Wollenhaupt, 2009, p. 13). Now that uGenius has scaled their technology off their proprietary design to industry standard technology bank may find their solutions more attractive. The new NCR APTRA Interactive Teller ATM was designed to allow consumers to choose between self-service ATM transactions or video assisted transactions in a 24 x7 remote location.

In November 2011 Citibank won the BAI – Finacle Global Banking Innovation Awards for its Smart Banking technologies implementation in 30 global locations (“Citi Wins”, 2011). Originally piloted in Singapore and Japan and Hong Kong, Citi now has Smart Bank solutions in New York and Washington D.C. Citi’s Smart Bank technology allows their customers to view interactive sales information on large 46-inch touchscreen that are embedded in the walls (Media Walls). Customers can also utilize free online access and Wi-Fi and take advantage of 24/7 access to customer service experts via video chat services. In Citi videoconferencing facilities customer can discuss investment strategies with Citi experts in other locations. Although the Citi solution most likely would not be classified as a video banking ADC it does utilize video ICT as part of its bank of the future strategy.

Video technology has vastly improved over the last 10 years and consumers now have experience and interest in video technology. Consumer interest and use has peaked due to the popularity of video content and services now available on internet based services like YouTube and social media sites (Ginovsky, 2010). Video banking ICT is now starting to move away from proprietary vendor implementations and into more mainstream standard solutions. These recent progressions in technology and usage could finally enable banks to achieve the consumer acceptance levels needed to deliver real ROI in the video banking channel.

**Consumer acceptance trends.** According to the National Information system data in 2011 the top 5 US banks were Chase, Bank of America, Citi, Wells Fargo and Goldman Sachs (Federal Reserve, 2011). Only Citi Bank has taken the lead in the implementation of video banking. Big banks tend to deliver a wide array of product and services to a large market of consumers. With such a large consumer base it can be difficult to develop product and services that will gain the consumer acceptance of a large regionally dispersed population consisting of

varying demographics. Post, Kalgan, & Kin-Nam 1995 found that large banks will tend to implement new technology as part of a focused strategic initiative, while small banks focus on costs when considering new technological implementations (Post, Kalgan, & Kin-Nam, 1995). Presently there is no big consumer demand for video banking that will push large financial institutions to aggressively pursue this technology. Now that the cost of video technology has decreased small and mid-size banks may begin to look to adopt video ADC technology as a way to distinguish themselves in their local markets and as a tool to help compete against big banks. Hall and Kahn, 2003 stated when weighing this kind of decision the most important thing to consider is that at any point in time the choice being made is not a choice between adopting and not adopting but a choice between adopting now or deferring the decision until later (Hall & Kahn, 2003). It seems that large and small FIs have deferred any video banking implementations until they can confirm that consumer acceptance levels are at a sustainable point that will support any cost of deploying a new video ADC. As cited in Ginovsky 2010, David Stern a global video services leader for IBM stated that "it's taken a while but retail organizations are starting to figure out how to leverage the technology in an affordable way to generate revenue... I think it's coming" (Ginovsky, 2010, para. 6). Research suggests that the current consumer environment may be poised to accept a video banking solution. Now may be the time for FIs to capitalize on the fact that new video based products such as Apple's Facetime for the iPhone, Skype and Oovoo video chat for broadband internet, video services on websites like Google and YouTube, HDTV via broadband all are now as popular as broadcast TV ("Video Banking", n.d.). In a July 2010 comScore press release it was revealed that:

178 million US internet users watched online video content during the month for an average of 14.7 hours per viewer. Google and its subsidiary YouTube are the top video

sites, with 143.2 million unique viewers, although Facebook is catching up with 46.6 million viewers (comScore, 2010).

These results indicate that consumer acceptance of video technology is on the rise. Now may be the time for FIs to reach out again to consumers with targeted products and services delivered via a video ADC. Citi bank found in a 2010 case study that consumers preferred a video banker's expertise in helping solve a complex issue versus having to leave, schedule a later appointment or go to another branch location for resolution (Ginovsky, 2010, para. 10). There may be a digital divide between consumers who may prefer a video banker over the traditional face-to-face transaction but if the technology can meet the needs of the consumer there may be a significant number of the population willing to accept this technology. As the population ages and millennial generation consumers born after 1980 becomes the primary target market for FIs consumer acceptance of video ADCs may become less of an issue and more of a standard for attracting these consumers (Case, 2011). In a Cisco IBSG study on consumer attitudes toward video, results showed that 53 percent of U.S. Generation Y consumers born between 1980 and 1992 use desktop video to communicate with friends and family, and 41 percent use mobile video (Hislop & Morland, 2011). Hislop & Morland 2011 also found that video is popular among the over-50 group, with 28 percent using video to interact with others.

The Gen Z population, born in or after 1990, is the next big market of consumers banks will be looking to attract ("Consumers of tomorrow," 2011). This generation has embraced technology some since their pre-school and elementary years, and it may prove to be sound business strategy to prepare today for the customers of tomorrow by building systems that deliver products and services to them in a technology platform they already are using. Some industry analyst and FI executives have recently expressed that now is the time to begin video

banking implementations, as cited in Wollenhaupt, 2011 Bob Meara, senior analyst with financial research firm Celent stated that “The macro trend here is there is more use of video and it’s not as strange or scary as it once was” (Wollenhaupt, 2011, p. 7). Five County Credit Union opened two new branches using uGenius Personal Teller Machines and Mike Foley vice president of sales and business development, for Five County Credit Union also stated that “The feedback we’ve received has been mostly positive but the folks that aren’t as comfortable using those machines or say they prefer a real person tend to be a little older” (Wollenhaupt, 2011, p. 8). Joint ventures between developers and manufacturers are beginning to form that may further boost industry and consumer acceptance. In 2012 NCR took a minority equity stake in uGenius Technology in an effort to boost their strategic position in the ATM market. NCR's plans to allow their APTRA Interactive Teller solution to use the uGenius video banking technology to give consumers a choice to conduct teller transactions with the assistance of a live, remote video teller, or, they can use the NCR SelfServ solution for traditional ATM transactions (“NCR Makes Strategic Investment”, 2012).

If the FIs, application developer, hardware manufacturers, and video ICT are all primed for a wave of consumer adoption of video technology, bank executive will still need to look closely at past and current trends of other ICT consumer adoption patterns to help determine how soon they may wish to venture into this new video ADC technology.

### **Technology Adoption**

Research studies suggest that many factors can impact technology adoption and this paper is not an exhaustive study of the diffusion of ICT but a restricted review of past research that seem pertinent to 2012 video banking implementation in financial institutions. One particular study on technology adoption conducted in 2003 by Bronwyn H. Hall and Beethika

Khan in a National Bureau of Economic Research working paper looked at the adoption of new technology. Hall & Khan 2003 reference several previous studies on technology diffusion in their working papers. On the topic of consumer adoption some notable references would include Harald Gruber and Frank Verboven who found that competition increases adoption by lowering prices, Philip Parker and Lars-Hendrik Röller found similar results as well in the diffusion of mobile telecommunications (Hall & Khan, 2003); economists Paul Stoneman found that adoption should not take place the instant that benefits equal costs, but should be delayed until benefits are somewhat above costs as part of Avinash Dixit and Robert Pindyck real option framework theory (Hall & Khan, 2003); Nathan Rosenberg identified factors that can impact diffusion rates such as the improvements made to the technology after its introduction, the invention of new uses for the technology, and the development of complementary inputs such as user skills (as cited in Hall & Khan, 2003).

The adoption of video banking technology can be analyzed using past and current diffusion of innovations theories and models to assist financial industries professionals in making modern day decisions on when and how to implement the technology.

Hall & Khan 2003 found that a stable and secure customer base is an important factor for technology adoption and in order to reduce the risk on new technology implementations, organizations will look to achieve a strong return on investment (Hall & Khan, 2003). This theory is a common approach most financial institutions utilize in their approach to innovation.

Research that studied the adoption rates of past ADCs such as the ATM and online banking found correlations with bank size and technology adoption rate that may no longer hold true today. As cited in Hall & Khan 2003, Timothy Hannan and John McDowell found in 1984 that market concentration, bank size, whether or not the bank is owned by a holding company,

and market conditions all significantly affected the adoption of the ATM by U.S. banks during the period 1971-1979. Sullivan & Wang 2006 found that the primary four factors that significantly affect internet banking adoption include mean bank size, per capita income, household access to the Internet and average bank age (Sullivan & Wang, 2006). Although big banks have traditionally taken larger risk than smaller FIs and have been early adopters of new technology, in the current economic environment they have not made any significant and substantial investment in video banking ADCs. Big banks today are struggling with risk and reputational issues and concerns and may not be well positioned to take the innovative operational risk they once took in the past.

### **Summary**

Research suggests that since the early 1980s banks and ICT implementers have been working toward a Video ADC solution for consumers. After decades of several failed pilots some banks and industry professional have abandoned their efforts but some have continued their attempts to advance the technology. With lukewarm consumer acceptance and adoption of Video Banking implementations the vision of widespread Video Banking channels has not been achieved. Recent advancements in Video ICT has again sparked interest in the Video Banking ADC implementations and companies like uGenius has present empirical data with their credit union clients showing a real ROI on implementing video banking solutions. As large banks such as Citibank also enter into the realm of providing video based services to their customers the diffusion of the technology may be starting to move from an innovation phase to an early adopter phase. With the growth of video technology usage among our society, fostered by Internet based services such as YouTube, now may be the time for small and mid-size banks and other FIs to begin piloting and implementing their own solutions.

### **Chapter III: Methodology**

The problem when considering a video banking implementation is that there is no clear and proven path to a successful widespread consumer accepted video banking solution that exist today. Video Banking solutions have been debated for over a decade but no bank or ICT implementer has been able to solve the problem of selling this technology to the masses.

The purpose of this study is to present a model of consumer technology acceptance that will provide empirical data on acceptance and usage behavior of video banking by consumers. By using consumers actively participating in the financial industry market place as subjects a thorough understanding of the model may help FI industry professionals to determine the reasons for resistance toward video banking and also help in deciding on what effective actions can be taken to improve user acceptance and usage of video banking ADCs.

The research methodology for this study was chosen in an effort to also attempt to identify the consumer video technology adoption social influence (SI) variables that are also prevalent in contributing to the modern day mass adoption of social media technologies. If a significant correlation can be found between SI and other various measured variables (determinants) that may influence video banking consumer adoption behavioral intention (BI), then video banking ADC decision makers can make data driven decision on how, when, and if to implement video banking ICT. The justification and reasoning behind the methodology will be discussed in this chapter as the research method and design, instrument development, sample and data collection, and data analysis are also explained.

#### **Technology Acceptance Model**

Over the years many models have been developed to assist researchers in evaluating technology acceptance as seen in figure 1. In 1985, Fred Davis proposed the TAM model

suggesting that user motivations can be explained by three factors: Perceived ease of use, Perceived Usefulness, and Attitude toward using the system (Chuttur, 2009). The TAM model became a popular tool among researcher seeking to analyze and present data in various industry areas related to technology adoption.

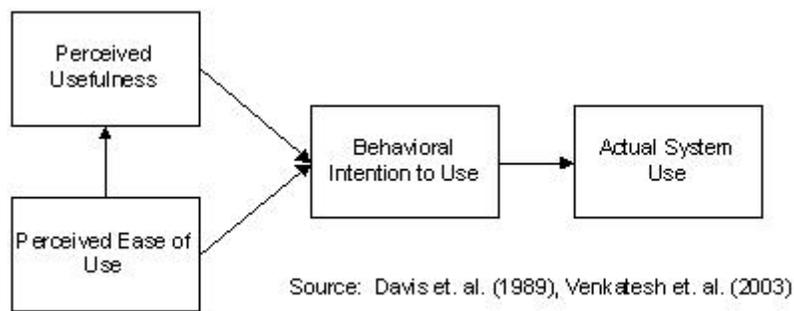


Figure 1. The TAM Model. Retrived From

<http://www.istheory.yorku.ca/Technologyacceptancemodel.htm>

Davis and others have made modifications to the original TAM model in efforts to improve its ability to predict technology adoption and answer some of the questions of critics of the model. Chuttur 2009 found that the Behavioral Intention (BI) factor was added to the TAM model used by Davis, Bagozzi, & Warshaw in 1989 and that Venkatesh and Davis 2000 proposed the TAM2 model adding antecedents variables to the perceived usefulness (PU) variable in an effort to provide more detailed explanation for the reasons participants found a given system useful (Chuttur, 2009).

Despite efforts to improve TAM some researcher still find fault in the model. Chuttur 2009 points to criticisms that remain concerning TAM's dependence on self-reported use instead of actual use data (Lee at el, 2003); needs for additional attitude variables (Yang & Yoo, 2003); and intent may not be representative of actual use (Bagozzi, 2007). Rocker 2010 found that factors like ease-of-use might not be appropriate anymore and that new factors, which are not

integrated in any of the existing models, might play crucial roles in the adoption decision (Röcker, 2010).

One particular model that attempt to address some of the previously stated TAM concerns would be the Pervasive Technology Model (PTAM). PTAM attempts to extend TAM by being able to analysis adoption of technology that becomes pervasive in our lives whether we are at work, study or play (Mohd, Ahmad, Samsudin & Sudin, 2011). PTAM adds three additional factors to TAM: Social Influence (SI), Trust (TR), and Integration (IN).

### **Research Design**

This study aims to test how the Pervasive Technology Acceptance Model (PTAM) applies to the use of video banking technology. The research methodology and methods for this research were selected in order to capture data on determinants and variables beyond what researcher have explored in the past when using the traditional Technology Acceptance Model (TAM). For this study, the focus will be on the major constructs (determinants) of the PTAM model. The independent determinants in the proposed research model in this study are perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), trust (TR), integration (IN), and attitude (A) with behavioral intention (BI) as the dependent determinant. The hypothesis that will be tested will be to identify how each determinants influence each other and specifically what correlation exist between other independent determents and the determinant variable behavioral intention (BI). Measurement items used in this research have been adapted from the measurement used in the PTAM study conducted by Mohd et. al 2011 as in figure 2.

The following are the design considerations for this research adapted from the guidelines suggested by Sekaran (2003) as cited in Kripanont 2007: (a) The Purpose of the Study. The purpose of this study is to provide exploratory research on the consumer adoption of video

banking technology; (b) The Type of Study. This is a correlational study because the research is intent in describing the important factors (determinants) that are associated with the problem of low video banking technology adoption rates; (c) The Study Setting. The study will be conducted in non-forced settings in online environments; (d) Unit of Analysis. For this study, the unit of analysis is an individual consumer within the financial industry market each respondent will be treated as an individual data source; (e) Time Horizon of the Study. This research study is classified as a cross-sectional study and will collect data once over a 30 day period to achieve the research purpose; (f) Extent of Researcher Interference with the Study. This research was conducted in the respondents chosen online setting and environment thus minimal interference by the researcher was controlled my lack of physical access to the respondent; (g) Data Collection. Data collection will be accomplished by using the questionnaire method to develop and deliver an online descriptive survey research instrument; (h) Data analysis. PTAM data will be utilized in the Pearson correlation analysis to measure and explain consumer video banking usage behavior.

### **Subject Selection and Description**

The sample will consist of adults with current banking relationships. The population sample will be chosen from the FIs customer base targeting the entire online and mobile banking customers. Typical size of a mid-size banks online and mobile community could be between 25,000 and 50,000 consumers.

The participants will be invited to complete an online questionnaire measuring the factors of the PTAM research model. The banks online community should be a good sample of various demographics representative of their target market. Participants will be contacted by the email

address the bank has on file for their customers and incentivized by the bank to participate in the service with either small dollar incentives or trial offers for additional products and services.

By selecting online and mobile population for the sample banks can be reasonably certain that the sample consist of consumers with enough technology literacy and experience to provide pertinent feedback on the consumer perception on what value is or is not present that would enhance or hinder consumer acceptance of video banking technology.

### **Instrumentation**

The instrument (questionnaire survey) was developed based on the determinants to be used as items to measure the correlation between variables in the proposed PTAM research model. The survey can then be used to collect data. The survey respondents can be asked to rate their agreements with the statements for measuring perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), trust (TR), and integration (IN), attitude (A) and behavioral intention (BI) by choosing a answer based on an 7-point Likert scale (1 = Strongly Disagree, 2 = Slightly Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Slightly Agree, 7 = Strongly Agree). The survey questionnaire is adapted from Davis 1989 as cited in Kripanont 2007 (see sample survey in Appendix A).

### **Data Collection Procedures**

Respondents will be asked by email and mailers to go to a website and complete an online questionnaire. Respondents will be presented with an online consent form (see sample consent form Appendix B) to review and accept prior to being presented with the survey. All respondents will be entered into a drawing for a chance to win a prize. Respondents email address will be obtained to send respondents who win the drawing notification and a prize redemption coupon. Respondent email address will not be stored with their survey answers in

order to maintain confidentiality and privacy. The survey questions were structured and separated into 8 sections starting from A-H. All but the Demographics Section H use a 7-point Likert scale a common research practice utilized for measuring attitudes.

**Section A** focused on perceived usefulness and consist of 5 items designed to determine if the respondent sees video banking technology as a useful service.

**Section B** focused on perceived ease of use and consisted of 6 items designed to determine if the respondent believes that video banking technology would be easy to use.

**Section C** focused on social influence and consisted of 6 items designed to determine if the respondent social interactions and social environment may influence the adoption of video banking technology.

**Section D** focused on trust and consisted of 5 items designed to determine if the respondent believes and trust in that using video banking technology and services will not comprise there sense of security and privacy when conducting banking transactions.

**Section E** focused on integration and consisted of 5 items designed to determine if the respondent believes that video banking integration into their daily environment is essential to adoption of the technology.

**Section F** focused on attitude and consisted of 5 items designed to determine if the respondent has a positive attitude toward the use of video banking technology.

**Section G** focused on behavioral intention and consisted of 4 items designed to determine if the respondent has intention on actual use of video banking technology.

**Section H** focused on demographics and consisted of 5 items designed to gather data to see if certain demographics trend toward any specific variable correlations, such as is age a factor in determining consumer video banking adoption rates.

## Data analysis

Data obtained over a 30 day period customer survey process can be analyzed to see what factors influence video banking adoption behavior. Data analysis can be used by financial industry professionals to better understand the variables that may influence consumer behavioral intention (BI) to diffuse wide spread adoption of video banking ADCs. The Predictive Analytics Software (PAWS) version 17.0 (formally SPSS) or Microsoft Excel can be used to analyze the data to calculate a correlation between variables (determinants) perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), trust (TR), integration (IN), attitude (A) and behavioral intention (BI), as the dependent determinant. The Pervasive Technology Acceptance Model (PTAM) can be used to analyze consumer motivation to use video banking ADCs. Survey instrument data can be used in the PTAM model to produce measurable data that can then be utilized in the Pearson correlation matrix to describe the range and strength of associations of the video banking variables, as well as provide correlation scores on the positive and negative associations and a p value score defining the significance level of each correlation. The formula for the Pearson correlation is computed as in figure 2.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Figure 2. The Pearson's r correlation formula. Retrieved from

<http://www.statisticshowto.com/articles/how-to-compute-pearsons-correlation-coefficients/>

**Data correlation significance.** Data correlation significance can be achieved by regression testing to test the significance of the  $r$  correlation calculated in the Pearson correlation matrix. The significance of the correlation conveys whether a correlation occurred due to chance and not due to an actual relation. The Predictive Analytics Software (PAWS) version 17.0 (formally SPSS) or Microsoft Excel can be used to calculate the level of significance.

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## Appendix A: Sample Survey Questionnaire

The purpose of this survey is to examine a Pervasive Technology Acceptance Model of Video Banking Consumer adoption within the Financial Industry. All responses will remain anonymous and be kept completely confidential.

<p><b>Video banking</b> is a term used for performing banking transactions or professional banking consultations via a remote video connection. Video banking can be performed via purpose built banking transaction machines (similar to an Automated teller machine), or via a videoconference enabled bank branch</p>		
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Statement	Strongly Agree	Agree	Slightly Agree	Neutral	Disagree	Slightly Disagree	Strongly Disagree
<b>Section A: Perceived Usefulness Toward Video Banking (Please select only one answer)</b>							
Being able to Video Chat with a bank teller to avoid standing in line and waiting for a live teller would be an option I would use.							
Being able to Video Chat with a bank loan officer to avoid waiting or having to making an appointment would be an option I would use.							
Being able to Video Chat with bank subject matter experts while I am in retail locations like in a grocery store or a mall would be an option I would use.							
I would use a video banking service if offered in a bank branch location.							
I would use a video banking service if offered in a Retail location like a grocery store or a mall							
<b>Section B: Perceived Ease Of Use Toward Video Banking (Please select only one answer)</b>							
I am comfortable using new technology							
I am comfortable using Video Chat technology							
I sometimes use self-service technology like ATMs and Self-Checkout terminals at the grocery store and I find them easy to use.							
I believe I could quickly learn on my own how to use a Video Banking ATM or Self-Checkout type video banking terminal.							
I believe I could quickly learn how to use a Video Banking ATM or Self-Checkout type Video Banking terminal after being helped by staff once or twice.							
24 x 7 Video Banking services will make accomplishing bank transactions easier and more convenient.							

<b>Section C: Social Influence Toward Video Banking (Please select only one answer)</b>							
<b>Statement</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Slightly Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Strongly Disagree</b>
Most of my friends would use Video Banking.							
Most of my coworkers would use Video Banking.							
Most of my family would use Video Banking.							
Most people today would use Video Banking							
I have or would use video chat services like Skype to speak with friends and family.							
I have or would use Video Services on the Internet like YouTube.							
<b>Section D: Trust Toward Video Banking (Please select only one answer)</b>							
I trust big banks to deliver secure Video Banking Solutions to consumers							
I trust my bank to deliver secure Video Banking Solutions to me.							
I trust community banks and credit unions to deliver secure Video Banking Solutions to consumers.							
Privacy needed for a Video Banking terminal would be the same as when using a ATM.							
I would trust a Video Teller as much as I would trust a branch teller.							
<b>Section E: Integration Toward Video Banking (Please select only one answer)</b>							
I would use video banking terminals located in places where I shop.							
I would use video banking terminals located in movie theaters, concert halls, and at sporting events.							
I would use video banking terminals located where I work.							
I would use video banking terminals even if the same service is not available on my mobile phone.							
I would use video banking terminals even if the same service is not available on my home PC, Tablet, or Laptop computer.							
<b>Section F: Attitude Toward Using Video Banking (Please select only one answer)</b>							
Video Banking terminals would work well for deposit transactions.							
Video Banking terminals would work well for withdrawal transactions.							
Video Banking terminals would work well for check cashing transactions.							
Video Banking terminals would work well for submitting loan applications.							
Video Banking terminals would work well for discussing and solving complex problems with bank subject matter experts.							

Statement	Strongly Agree	Agree	Slightly Agree	Neutral	Disagree	Slightly Disagree	Strongly Disagree
<b>Section G: Behavioral Intention Toward Video Banking (Please select only one answer)</b>							
I intend to use my banks video banking terminal if available in local branch locations.							
I intend to use my banks video banking terminal if available where I shop.							
I intend to use my banks video banking terminal if available where I work.							
I intend to use my banks video banking terminal if available in movie theaters, concert halls, and at sporting events that I attend.							
<b>Section H: Please Tell Us About Yourself (All responses will remain anonymous and be kept completely confidential.)</b>							
<b>Gender:</b>	<input type="checkbox"/> Male			<input type="checkbox"/> Female			
<b>Race:</b>	<input type="checkbox"/> African American <input type="checkbox"/> Asian <input type="checkbox"/> Hispanic			<input type="checkbox"/> Other <input type="checkbox"/> Native American <input type="checkbox"/> White			
<b>Age:</b>	<input type="checkbox"/> < 25 <input type="checkbox"/> 25 - 30 <input type="checkbox"/> 31 - 40			<input type="checkbox"/> 41 - 50 <input type="checkbox"/> 51 - 60 <input type="checkbox"/> > 60			
<b>Education:</b>	<input type="checkbox"/> Less than High School Diploma <input type="checkbox"/> High School Diploma or GED <input type="checkbox"/> Some College			<input type="checkbox"/> 2-Year Degree <input type="checkbox"/> 4-Year Degree <input type="checkbox"/> Graduate or			
<b>Marital Status:</b>	<input type="checkbox"/> Single, never married <input type="checkbox"/> Married <input type="checkbox"/> Separated			<input type="checkbox"/> Widowed <input type="checkbox"/> Divorced			
<b>Your Yearly Income:</b>	<input type="checkbox"/> < \$10,000 <input type="checkbox"/> \$10,000 – \$19,999 <input type="checkbox"/> \$20,000 - \$20,999 <input type="checkbox"/> \$30,000 - \$39,000			<input type="checkbox"/> \$40,000 - \$59,999 <input type="checkbox"/> \$60,000 – \$79,999 <input type="checkbox"/> \$80,000 - \$99,999 <input type="checkbox"/> More than \$100,000			
<b>Additional Comments:</b>							

## Appendix B: Sample Video Banking Online Survey Consent Form

### **Reason for the Study:**

This is a study in video banking consumer adoption that is being conducted by First Bank, New York, NY. The purpose of this study is to provide exploratory research on the consumer adoption of video banking technology.

### **What you will be asked to do:**

You will complete an online survey, which will take 15-20 minutes to complete. The survey includes questions about your attitudes and expectations toward video banking services and technology. Other survey questions will address some demographic information (e.g., age, marital status, race, etc.) to see if certain demographics trend toward any specific variable correlations, such as is age a factor in determining consumer video banking adoption rates. After you complete the questionnaire, we will score the survey and analyze the answers to measure and explain consumer video banking usage behavior.

### **How you may benefit from this Study:**

You will be entered in a drawing for one of 10 prizes to receive a 30 day free trial of one of our current product or services. The data collection period will last for 30 days. Within 30 days after the data collection period has ended the drawing will be conducted. Winners will receive the gift certificate via e-mail.

### **Risks or discomforts you may experience:**

No risks or discomforts are anticipated from taking part in this study. If you feel uncomfortable with a question, you can skip that question or withdraw from the study altogether. If you decide to quit at any time before you have finished the questionnaire, your answers will NOT be recorded.

### **Your confidentiality and privacy will be maintained:**

**Your responses will be kept completely confidential.** When you respond to the Internet survey we will not track your IP address. We will ask you to include your e-mail address when you complete the Internet survey so that we can enter you in the drawing. Your name and address will not be stored with data from your survey. Only the researchers will see your individual survey responses and the results of our content analysis. The list of e-mail addresses of our participants will be stored electronically in a secure network location.

### **You can decide to quit at any time:**

Your participation is voluntary; you are free to withdraw your participation from this study at any time. If you do not want to continue, you can simply leave this website. If you do not click on the "submit" button at the end of the survey, your answers and participation will not be recorded. You also may choose to skip any questions that you do not wish to answer. If you click on the "submit" button at the end of the survey, you will be entered in the drawing. The number of questions you answer will not affect your chances of winning.

### **How your survey responses will be used:**

The results of the study will be used for market research purposes only.

### **Who to contact for additional information:**

If you have concerns or questions about this study, please contact Mr. Rudy Strong at [Rudy.Strong@FirstBank.com](mailto:Rudy.Strong@FirstBank.com). By beginning the survey, you acknowledge that you are 18 years of age or older and have read this information and agree to participate in this research study, with the knowledge that you are free to withdraw your participation at any time without penalty.