

VeriChip™

Implantable RFID for
The Health Industry

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Executive Summary

VeriChip Corporation markets the world's first sub-dermal radio frequency identification device (RFID). This invention can be used in many healthcare, emergency, financial, and security applications. Medical applications, possible since FDA approval in November 2004, are the focus of this analysis. The VeriChip Health Information System consists of the implantable chip (about the size of a grain of rice), a proprietary hand-held scanner, and a secure database containing the patient's medical information. Target markets include trauma centers, hospitals, physician's offices, and nursing homes, in an attempt to improve the quality and safety of healthcare recording for those with chronic health problems.

VeriChip's strengths lie in their resources and capabilities, and their potential to develop a significant competitive advantage. Due to an existing patent for the implantable chip, VeriChip is the first to market this technology, giving them a first mover advantage. A large R&D focus will ensure that VeriChip continues to develop additional capabilities, to include medical monitoring and eventually GPS tracking. This technology has the capabilities of use to the security and finance industries (domestic and international) due to its modest cost and unique features. Significant expertise exists in research and development, as the parent company (Applied Digital) owns Digital Angel and eXI Wireless, firms that have successfully marketed animal-implantable and external RFID tags for years. VeriChip can take advantage of this access to established distribution networks. VeriChip has no direct competition, their indirect competition (substitutions) is, however, fierce and includes numerous alternative technologies that may prove perfectly adequate to customer needs.

VeriChip's product is both innovative and controversial, which may prove to be detrimental to the firm. Hospitals need to be aggressively engaged to increase the size and viability of the VeriChip network. A focused marketing campaign must be delivered to the public to address the safety and efficacy of the implant. The company also faces concerns from rights groups, those afraid of "Big Brother" watching, privacy advocates, and identity theft concerns; all of which must be addressed directly and openly. Additionally, VeriChip must clearly differentiate their product from available substitutes if they expect to become a genuine option for the 9 out of 10 Americans who think the whole idea of computer chip implantation is "creepy". International markets may provide better opportunities for VeriChip to establish use patterns and acceptability that can eventually ease widespread deployment in the United States.

VeriChip revenue will come from three sources: sales of the microchips, scanners, and subscription fees. Using an analogous firm, this report estimates demand for the product using three potential growth scenarios, from years 1 through 15. Based on a cost structure derived from benchmarked companies, an analysis of VeriChip's expected profitability for years 1, 5, 10, and 15 is also provided. Under the most optimistic scenario, VeriChip will only break even after year 10, and end year 15 with positive earnings of \$49,350,000. Based on a "reasonable" scenario, the break even point will occur after year 15. A "conservative" scenario suggests VeriChip will end up losing \$35,250,000 at year 15.

Introduction

RFID Technology

RFID (Radio Frequency Identification Device) is a term applied to any device that can be sensed or detected at a distance by radio frequencies. RFID technology consists of four principal components: a “tag,” a reader, a computer network, and the related business applications software. The tag contains a microchip with identification data and an antenna for transmitting that information. The reader uses radio waves to “read” the tag, with the reader’s signal (i.e., a radio wave at a specific frequency), “exciting” the antenna and causing the microchip to transmit its data. The data must be connected to some type of computer system or database to process the transmitted data.

Although RFID technology has existed for over 50 years, application of the technology can be characterized as in its infancy. Worldwide revenues from RFID tags are expected to increase from \$300 million in 2004 to \$2.8 billion in 2009. During this five-year period, it is predicted that the technology will be implemented in a number of industries, making a significant impact on the efficiency of many business processes.

According to the Boston Consulting Group, about one-third of the cost of healthcare in the United States results from the managing of medical records, such as patient health records. Many healthcare providers are not currently able to track patient data within their facilities, let alone the entire healthcare system. The inadequacies of the healthcare industry’s IT infrastructure and record-keeping system are evident every time one fills out a form detailing his or her personal information and medical history. In an effort to address the situation, the White House announced in January 2005 that it would propose that the federal government spend \$125 million in next year’s budget to test computerization of health records. The government is spending \$50 million on this in the 2004/2005-budget year. RFID technology may prove to be an important component of this initiative.¹

The Parent Firm

Applied Digital (ADSX) operates in three business segments: Advanced Technology (five wholly-owned subsidiaries, which includes VeriChip Corporation), and two majority-owned subsidiaries, Digital Angel Corporation and InfoTech. VeriChip Corporation (the topic of this business analysis) is known for RFID devices that are implantable into the human body. The Digital Angel Corporation focuses on keeping track of fish, livestock, and pets via RFID tags. One of the Advanced Technology segment’s primary objectives in 2005 will be to begin to generate more sales volumes of VeriChip. The firm hopes that the FDA’s clearance (as of October 2004) of VeriChip for certain medical applications will serve as a springboard for deriving increased VeriChip revenues. As part of Applied Digital’s growth strategy, they will work toward developing the markets for VeriChip throughout the world, particularly in healthcare industries. In addition, Applied Digital recently announced their entrance into an agreement to

¹ Applied Digital Solutions, Inc., Form 10-K/A No. 3, Annual Report as filed with the Securities and Exchange Commission on March 19, 2005.

acquire eXI Wireless Inc. (“eXI”), which has developed and markets external RFID patient wandering, infant protection and asset tracking/location systems.²

The Business Model

Product Description

The VeriChip is marketed as the world’s first sub-dermal, RFID microchip (i.e., inserted under human skin), for use in a variety of healthcare, emergency, and security applications. The brief outpatient “chipping” procedure lasts just a few minutes, is done by a medical doctor, and involves local anesthetic followed by a quick, “painless” insertion of the VeriChip (usually in the triceps area of the right arm). Once under the skin, the VeriChip is inconspicuous to the naked eye. The VeriChip Health Information System consists of an implantable RFID tag, a proprietary hand-held scanner, and secure database containing the patient approved healthcare information. The VeriChip microchip, which is about the size of a grain of rice, contains a unique verification number that is captured by passing a proprietary scanner over the VeriChip tag in a doctor’s office or hospital. This data is then linked to the VeriChip subscriber database via encrypted Internet access for use by the registered requesting healthcare provider. The medical personnel can then unlock that portion of a secure database containing the individual’s medical information. The electronic database, not the chip, would be updated with each medical visit (the chip itself contains no medical records). The patient would initially wear a MedicAlert bracelet to call attention to the chip in case of an emergency. In the future, if the VeriChip technology really takes off, emergency rooms may scan for chips as a normal admissions process.³

The VeriChip technology is subject to federal, state, and local regulation in the United States, including the FDA, and is also subject to regulation by government entities in other countries. The FDA ruled in October 2002 that VeriChip is a regulated medical device when marketed to provide information to assist in the diagnosis or treatment of injury or illness. Note that VeriChip is not an FDA-regulated device with regard to its security, financial, or personal identification/safety applications. On October 12, 2004, the FDA cleared the VeriChip for medical applications in the United States. The FDA’s approval limits the use of the VeriChip in medical applications by allowing only an identification number to be included on the chip (which is linked to a separate database as previously described). The recent FDA decision gave VeriChip the green light to begin selling the implantable human microchip in the United States for medical implantations.

Intellectual Property

The company has executed an exclusive eleven-year distribution and licensing agreement dated March 4, 2002, with Applied Digital’s subsidiary, Digital Angel, covering the manufacturing, purchasing, and distribution of VeriChip. The agreement includes a license for the use of Digital Angel’s implantable microchip and RFID technology in VeriChip’s identified markets. This agreement can be terminated if VeriChip does not purchase certain prescribed minimum quantities. Digital Angel is the sole manufacturer and supplier to VeriChip Corporation. Digital Angel® is a registered trademark of Digital Angel and an application for a

² Applied Digital Solutions, Inc., Form 10-K/A No. 3, Annual Report as filed with the Securities and Exchange Commission, March 19, 2005

³ Applied Digital Solutions, Inc., Form 10-K/A

trademark registration is pending. VeriChip technology is produced under patent registrations #6,400,338 and #5,211,129. VeriChip™ is a trademark, and is currently in process at the United States Patent & Trademark Office.⁴

The firm believes that these patents and trademarks in the aggregate constitute a valuable asset and that they offer a competitive advantage and/or a barrier to entry. In large part, the success of the VeriChip segment is dependent on its proprietary information and technology. The company intends to seek patent protection to maintain a competitive edge, to vigorously defend the existing patents as appropriate.³ VeriChip's future competitiveness rests on having a unique product that is not replicated by anyone else, thus creating customer value. They should continue to invest heavily in R&D to meet consumer needs in the future. For example, the firm is in the process of evaluating and increasing VeriChip's memory, temperature sensing capabilities, scanning distance, and developing read/write capabilities, which could create additional potential applications for the product. A GPS long range feature is also currently being researched for tracking via satellite – the scanners now only have a maximum range of about 30 feet.

External Analysis

Customer Analysis

Target Market

The healthcare industry is one of the main areas where VeriChip is focusing attention, and will be the topic of this analysis. Specific targets include trauma centers, hospitals, physician's offices, and nursing homes. Applied Digital believes that their VeriChip product could readily become the electronic front end to satisfy the critical need that has been identified for the centralization and computerization of healthcare records. Examples of the healthcare information applications for VeriChip include, among others: implanted medical device identification; emergency access to patient-supplied health information; portable medical records access - including insurance information; in-hospital patient identification; and disease/treatment management of at-risk populations (such as vaccination history.) The chip will be marketed toward those with health problems, such as diabetes and Alzheimer's, in an effort to provide error-free, timely medical information. The firm believes that these medical applications will be an important part of their VeriChip business model.⁵

Decision Criteria

A customer's decision criteria are based on the desire for a differentiated product. If a consumer simply desires to have RFID tracking capabilities for oneself or a loved one, there are removable tags, biometric cards, and bracelets that can be purchased to accomplish this. The VeriChip has the one-of-a-kind attribute of being implantable, thus a potential customer makes a decision based on what product features are desired (i.e., the permanence of the VeriChip). The fact that the VeriChip cannot be removed makes it especially attractive when caring for the elderly or those impaired by Alzheimer's disease as these patients would have a much harder time removing an implant RFID tag, than an external bracelet.

⁴ Applied Digital Solutions, Inc., Form 10-K/A No. 3, Annual Report as filed with the Securities and Exchange Commission on March 19, 2005.

⁵ Applied Digital Solutions, Inc., Form 10-K/A

Price sensitivity is not felt to be a big issue for VeriChip. The chipping is itself is inexpensive at \$200, which is a patient's cost. The proprietary handheld scanner is only \$650 (a medical facility's expense). The service, known as the Global VeriChip Subscriber (GVS) Registry service is \$9.95 per month, which will provide a predictable and non-cyclical revenue stream for VeriChip. Once the system is implemented, it is felt that even if the price goes up, there will be a great cost for the hospital to switch to another system (interchangeability issues with the data), thus the healthcare subscribers will stay with VeriChip. The patient will probably not want to have another invasive procedure either – to remove the VeriChip and have another brand implanted.

The VeriChip business model for attracting sales is based on product differentiation. This device is marketed as the world's first microchip that can be implanted under an individual's skin. It is very unique and unlike any other product in the marketplace; thus functionality is being provided that is not available anywhere else.

Product Acceptance

Acceptance of the product will be very important to VeriChip's success. Overcoming public (and provider) perception of "Big Brother" watching will be very important and could be a huge barrier to the marketplace. Finding a market will make or break VeriChip. In addition to contacts they have made within the healthcare industry, VeriChip marketing representatives have approached diabetes, Alzheimer's, and other patient and advocacy groups as an option to prevent errors in the care of chronically ill patients.⁶ According to Mike Liard, an RFID analyst for Venture Development Corp., ".....On the animal level, there's a market for this technology (already 1 million animals have been implanted).....But what's the value proposition for the doctors and the human patients? There haven't been any clear answers in that area" This company has been a magnet for social criticism as well. Privacy advocates have argued that its technology is a target for thieves eager to steal personal information. In addition, the fear is that health insurance companies, hospitals, and the government may require individuals to get the implants or face higher costs or reduced services (i.e., life may become difficult for those that choose not to have the implant). In addition, futurists feel that someday electronic devices will routinely communicate from inside the human body, uploading data to the brain from outside sources (although this is very far-fetched). Experts say the furor surrounding the VeriChip may mark just the beginning of a long, intense battle over the role of technology inside the human body. Clearly, marketing and forming the proper image of the firm and product will be very important to VeriChip's future success.⁷

Market Analysis

Product Market Description

The potential niche for the VeriChip product in its introductory phase is the healthcare industry (hospital emergency rooms and private practice doctors). VeriChip's market strategy for acceptance of its product includes giving away the equipment that reads the chips (valued at \$650). This approach is being implemented at 200 trauma centers nationwide, in the hopes that

⁶ Christopher Gearon, *IT's Inside You*, *H&HN: Hospitals & Health Networks*, Feb 2005, Vol 79, Issue 2.

⁷ Charles J. Murray, *Chip for Human a Blessing to Some, a Curse to Others*, *Electronic Engineering Times*, Nov 29, 2004.

other centers will follow the lead. Specific targeting of the chip will be toward those with chronic health conditions who are unconscious or otherwise incapable of communicating, such as Alzheimer's patients. According to a survey conducted by the American Hospital Association, almost half of all American (133 million) live with a chronic condition, so the market pool is very large.⁸ VeriChip technology may also be used for patient safety to ensure that the correct medical procedure and/or medication is being given to the right person. For patients with implants, the VeriChip could be linked to or contain data on the manufacturer of an implant as well as its serial number, recall information, last battery change, etc., which can be obtained without an invasive procedure.

Product Market Population

It is estimated that up to 30 percent of all healthcare organizations currently use an electronic medical record (EMR) system – this is the market that would be the most inclined to take a step further into the VeriChip world. According to a study conducted by the American Hospital Association, there are 5,764 hospitals in the United States, which provides for a large market to choose from. The “Most Wired Hospital Survey and Benchmarking Study”, conducted by the American Hospital Association, asked hospitals to report their use of information technology in addressing safety and quality issues. A listing of the top 100 hospitals that are at the cutting edge of IT usage was then compiled; the demographics are as shown in Appendix 1. Clearly, medium sized hospitals located in the Central region of the United States, in urban areas, that have non-teaching status would be the optimal target market.⁹

Acceptance won't be an easy sell though. Even Scott Silverman, the CEO of Applied Digital, states that the company's own research reveals that 9 out of 10 people find “the whole thing creepy”.¹⁰

One of the first VeriChip customers is the prestigious Beth Israel Medical Center (a Harvard Medical School affiliate). They will begin to employ the RFID tags in an effort to track providers, patients, and equipment over a wireless network in their 48,000 square foot emergency department. This is certainly good news for VeriChip, Corp.

Product Growth

VeriChip is working on developing application evaluation sites to demonstrate the chip's return on investment. VeriChip's Vice President for medical applications, Richard Seelig, M.D. has stated he expects an initial 20 percent ROI in the emergency room. The VP does concede that, “...It will take about two years before we get to the point where (providers will ask) ‘Why aren't we using this?’” This statement suggests that even VeriChip does not expect initial demand to be great.¹¹ VeriChip is running a pre-registration program, where customers can take \$50 off their “chipping” procedure if they are one of the first 100,000 registrants, in an effort to jump start demand.

⁸ http://www.aha.org/aha/resource_center/fastfacts (online), May 16 2005.

⁹ *Health Management Technology, Industry Watch*, July 2003, www.healthmgttech.com (online), May 16 2005.

¹⁰ Christopher Gearon, IT's Inside You, *H&HN: Hospitals & Health Networks*, Feb 2005, Vol 79, Issue 2

¹¹ Christopher Gearon, IT's Inside You

Projected Growth

When comparing VeriChip to Digital Angel (RFID tracking for pets), fifteen years ago, Applied Digital gave away scanners to a few hundred animal shelters and veterinary clinics when it first entered the pet market. They have currently sold 50,000 scanners (over 15 years). Per a company spokesperson, if the procedure proves as popular for use in humans as in pets, that could mean up to 1 million chips implanted in people (over that same timeframe). So far (Nov 2004), just 1,000 people across the globe have had the devices implanted – with very few of them in the United States. Due to the need for FDA approval in America (which was just approved in Nov 04), the United States is behind in the VeriChip process. Organizations in Europe and Mexico have taken delivery of VeriChip systems for diabetes and heart patients as early as 2003.¹²

Distribution

Distribution channels are considered to be one of this firm's critical customer value drivers. To date, VeriChip Corporation has entered into several exclusive distribution agreements, generally with five-year terms, with companies such as Afritrac (PTY) Ltd, Cybertek, DATA, Inc., Sodiacol S.A., and Surge IT Solutions. There are currently eleven authorized VeriChip Centers throughout the United States (Medical Doctors), with VeriChip distributors in Argentina, Brazil, Chile, Mexico, Paraguay, Spain, and Uruguay. Upon signing an exclusive agreement with VeriChip Corporation, a distributor is appointed as VeriChip Corporation's distributor of products in a given territory or for a given customer base. This provides the distributor with exclusive rights to market, promote, sell and provide services for VeriChip. A distributor is expected to achieve certain sales quotas in order to maintain its distribution rights. Going forward, VeriChip plans to offer only non-exclusive agreements to prospective distributors. To date, no distributor has sold more than a minimal amount of the VeriChip product.

On November 10, 2004, VeriChip Corporation entered into a Group Purchasing Program Agreement with Henry Schein, Inc. (HSI). Under the terms of the two-year agreement, which became effective on November 4, 2004, HSI is to distribute the FDA-compliant VeriChip product line to health care professionals on a consignment basis. HSI is a major supplier of generic and branded pharmaceuticals, vaccines, medical and surgical supplies, diagnostic kits, and medical related equipment.¹³

The acquisition of eXI was very beneficial to VeriChip as they brought with them a proven management team and over 200 dealers and distributors in North America. It is intended that these dealers will now distribute all VeriChip Corporation products and services.¹⁴

Competitor Analysis

The point upon which VeriChip has differentiated its product to date has been the FDA approved human implantability of the passive RFID chip. The recent incorporation of eXI Wireless into VeriChip in April 2005 has broadened the product line to include external products,

¹² Josh McHugh, A Chip in Your Shoulder, Should I Get An RFID Implant?, Nov 10, 2004, MSNBC.

¹³ *Heart Disease Weekly*, Nov 7, 2004, via NewsRx.com & NewsRx.net (online), May 16 2005.

¹⁴ Applied Digital Solutions, Inc., Form 10-K/A No. 3, Annual Report as filed with the Securities and Exchange Commission on March 19, 2005.

but the point of emphasis remains on the implants. The FDA approval for the chip is for its use as a patient identification and health information under a class II special controls classification. That means that prescribed guidance must be followed in order to consider the device to be considered adequately effective. No other company has yet attempted to get a similar approval for any implantable tracking device. There are, therefore, no direct competitors currently in the market or on the near horizon. There are however several other technologies and companies that are vying to satisfy the same tracking and identification requirements as VeriChip.

VeriChip's value proposition hinges on the use of the device, on a subscription basis, to tie people and data about them together with a high degree of certainty. The certainty exists because, unlike external devices, the VeriChip cannot be simply lost or easily stolen and used for nefarious purposes. Temporary and external devices while frequently less expensive will sacrifice some degree of the certainty that VeriChip can provide.

In the absence of direct competitor or likely entrants, the market for substitutions also needs to be considered. While substitutions may sacrifice some of the certainty VeriChip offers, they remain a serious and potentially completely adequate alternative to secure positive identification and better controlled access to patient information. Several technologies are currently available that can also be used to tie patient identification to their medical data in near real time. Bar codes are probably the oldest and most common alternative, infrared badging is available today, and external RFID has a number of vendors currently providing hospital services.

External RFID - The most comparable product is an external RFID tagging system that can be integrated with tracking and data services to ensure patient identification and care information are current and correct. VeriChip competes in this space now, though only recently, and many other vendors are also available for these systems. Radianse, Emergisoft, and many others can provide either off the shelf or custom packages for hospitals needing this newer type of tracking mechanism. In some cases the chips can also be reused, though they are frequently retired. VeriChip's eXI Wireless group has a published case study citing a 7 year operating cost of only about \$0.64 per patient for the external RFID component of their pediatric RFID tracking efforts¹⁵. Depending on the vendor the external chips can be passive, requiring workers to scan them to retrieve data, or active, providing data to workers automatically.

Infrared - Similar to external RFID, infrared tracking systems are based on wearable badges and tracking sensors that can be used to identify the wearer and, through the information management system, tie back to pertinent information in the data storage system. Patient Care Technology Systems, Versus, and many others can provide similar types of systems. These are passive tracking systems and they rely on line-of-sight to a reader, frequently in the ceiling, to provide access relevant data.

Barcodes - Barcoding is probably the most ubiquitous and familiar of all technology based alternatives to the VeriChip implants. They have been in use for decades and are easily generated and put into bracelets or printed on stickers that can be affixed as and where needed. These systems seem relatively low tech and they are more prone to human errors, such as mislabeling, but they are clearly one option that has a lengthy track record and can be appropriately managed. Barcode based systems require readers to access data.

¹⁵ "eXI Solutions at Work: St. Elizabeth Medical Center", www.exi.com, March 2005.

Environmental Analysis

The patient identification and record matching market is significant with over 5000 hospitals and many other ancillary facilities that all need to effectively manage patient care. At this time it is an even more attractive market as Health Insurance Portability and Accountability Act of 1996 (HIPAA) requirements regarding data confidentiality force update of many hospital systems and the Joint Commission on Accreditation of Healthcare Organizations has made patient identification through treatment a point of emphasis in its 2005 National Patient Safety Goals.

VeriChip is strengthened in this market by the addition of the eXI Wireless lines but it is dependent on outsourced manufacture for its implantable product line. The applicator is not a sophisticated piece of equipment and can be manufactured by numerous vendors, but the chip is solely produced by Raytheon Microelectronics Espana SA and acquired through Digital Angel. Given the modest product volume and the lack of current options for manufacture, VeriChip is not situated well to drive down their cost per chip at this time.

Potential entrants and direct competitors do not loom as a major threat currently, but ample substitutes exist and do not carry some of the baggage associated with what Applied Digital's CEO concedes is the "creepy" aspect of an implantable chip. Most other substitutes are temporary and rely on institution specific infrastructure for their use. VeriChip's subscription model relies on creating network effects that currently don't exist and appear unlikely in the near term in the healthcare application of the implants. Without broad deployment the chip offers the implantee no actual return on their investment.

VeriChip has, through recent acquisition, established a solid complementary product line and also has security and access control applications that can be associated with the implantable chip. These are, however, recent additions and the ability to link product lines effectively has not yet been established.

Significant controversy exists regarding the use of implantable RFID tags in humans. Privacy, religious, and conspiracy concerns regarding the "big brother" or "mark of the beast" are significant. With the increases in identity theft, the protection of personal information has become a larger concern and the use of data associated with a tracking mechanism creates some discomfort for many. Foreign cultures such as Japan and Western European are more open to new technologies and testing these waters first could give VeriChip a better understanding of how the product can be successfully marketed.

Technological change is a real threat to the long term viability of the VeriChip product. Not only are there technologies available that can replicate many of the security advantages of the implantable RFID, newer and possibly more adaptable and secure technologies could easily become available rendering the slight advantage that VeriChip has irrelevant.

Regulatory changes can become a very real threat as the Food and Drug Administration further develops standards for the use of RFID in healthcare. FDA is currently doing this for use of RFID in tracking drugs and has begun taking comments on what types of RFID (hf/uhf, passive/active, read only/writable) to allow in patient care and what standards to apply to ensure security and any necessary interoperability. The Federal Communications Commission could also impact the VeriChip implantable chips long term marketability through changes to radiofrequency and device rules.

Risks associated with basic healthcare management requirements for patient identification, tracking, and privacy such as those in HIPAA are also potentially relevant for VeriChip. Any future changes could serve either to greatly enhance demand or to mandate an alternative set of technologies.

Numerous lawsuits are currently underway regarding the implant technology, most under sister company Digital Angel, that could ultimately establish someone else's right to use of the device or some control over its future. This could also pose a significant threat should the technology begin to achieve wide acceptance.

Internal Assessment

Core Competencies

As already mentioned, VeriChip is an implantable RFID chip used for accessing important medical information. Based out of Florida, VeriChip Corporation has invented this product in which they have named after their corporation. As this chip is the only of its kind, VeriChip is trying to make their mark in the RFID Industry. In order for them to do this, VeriChip needs to look at the RFID industry's key success factors and implement them into their business model.

Industry Success Factors

VeriChip is has a variety of industry success factors. VeriChip's industry success factors are being strong in research and development, having good brand name recognition, finding the right distribution, getting a larger market size, having the right customer mix, and making their product with the right characteristics.

The first industry success factor that VeriChip has excelled at is Product Development and Innovation. VeriChip has been able to leverage the success of the same kind of technology of Applied Digital's other subsidiary, Digital Angel. Only Digital Angel's product has only been tested and approved for use on several types of animals. VeriChip has taken this knowledge and development and has just tweaked the product so it would be usable in humans. With the product development that has already been done in another subsidiary; this has helped VeriChip keep their costs down as they already have the knowledge to build the product.

Digital Angel has also helped VeriChip use Brand Name and Image as a key success factor. Their animal tracking and identification business has been around since the 1940's and has been very successful in their market.¹⁶ With both Digital Angel and VeriChip being under Applied Digital, the success of one can breed onto the other. If a customer has a chip in their livestock or even family pet, and they have found it to be successful, they may look into the same company when they may be in a need for a chip for themselves. But this could also, backfire on VeriChip. If a customer has not had luck with a previous use of the product, then they may be less likely to go with a similar product made by the same company in the future.

Another key success factor for the RFID industry is Distribution. VeriChip has recognized this factor as one of the most important challenges they have. Since VeriChip is a very small company and they do not have the resources to secure their own distribution channel. Knowing they needed to find other means, they have made alliances with several key distributors all

¹⁶ Applied Digital Corporation, 2003, 2003 Annual Report, Delray Beach, FL

around the world. In the United States, VeriChip has teamed up with Henry Schein, a \$3.4 billion-a-year business that works almost half of the medical practices in the US.¹⁷ They also have distributors in South Africa, Russia, Spain, Chile, Central America, and Mexico, just to name a few. VeriChip understands that these distributors already have a name in the industry, and they can all help introduce their product to the medical world.

Market size and structure is a 4th key industry factor in the RFID Market. As the VeriChip is a new product, the current market size is very small. VeriChip needs to take advantage of being the first-mover and grow the market so their chips are readily available and readily accepted by almost every hospital in the world. If the nearby hospital or medical service does not have the capability of reading these chips, there will be no use for the public to have them.

Since this is an implantable chip, the product and service characteristics that the chip is comprised of are very important to the success of the chip. The main characteristic that VeriChip has is that it is as small as a grain of rice. The chip is also convenient. The chip can be implanted in five minutes by just going to a local doctor's office. It requires only a small amount of numbing and use of a needle to implant the chip in the lower section of the arm.

Since the FDA has just recently approved the use of this chip for in the healthcare industry, VeriChip has been trying to put together the right customer mix to market their product to. They have currently identified anyone with a common chronic illness that an impaired communication may occur. Some of these illnesses are seizure disorders, stroke, diabetes, Alzheimer's, and those with cardiac conditions.¹⁸ VeriChip's main focus in marketing of their product is to focus on the times the individual may be in a situation that they cannot speak for themselves, and the chip can do the talking. VeriChip is also offering proprietary products along with their chips to help market their product. They are giving away these complementary products to hospitals and doctors offices in order to get their name out to the public.

VRISA Analysis

In order for VeriChip to be successful, they need to also look at their strategic assets. These assets at least need to be comparable to their competitors in order to succeed. VeriChip's assets can be broken down into three different assets; tangible, intangible, and human. These assets can, if valued, rare, difficult to imitate or substitute, and if appropriable, help VeriChip achieve a sustainable competitive advantage over their competitors.

VeriChip's tangible assets are limited. The only tangible asset they own is their property and building where they are located. VeriChip's intangible assets are the assets that control their livelihood. First of all, they have a patent to protect their VeriChip technology. This patent prevents competitors from making a chip that is just like VeriChip's. They also have the market research findings. With Digital Angel also being a subsidiary of Applied Digital, VeriChip has the research for the chips without having to do much work. They also have strong distribution channels. As mentioned earlier, they have aligned with some of the top healthcare distributors in the world. Finally, VeriChip has their human assets. They have the experts in the industry on implantable RFID technology working with them. Scott Silverman, Chairman and CEO of VeriChip, has been with Applied Digital off and on since 1995. He leads a wide range of

¹⁷ Charles J. Murray, 2004, Chip for humans a blessing to some, a curse to others, Electronic Engineering Times, Issue 1349, p4

¹⁸ A Revolution in Healthcare Information Access, www.4VeriChip.com, April 18, 2005

executives, in which many have experience in executing business models in the technology industry.

Even with the resources they have, VeriChip does have resource gaps. First of all they do not have client relations. As this is such a new technology, most of their customers know their parent company as for making tags for animals, not for humans. They also have little cash. In 2003, they paid off their debt in full to IBM, but only by negotiating the \$100 million that they owed IBM down to \$30 million and agreed to fire their current CEO.¹⁹ Also, VeriChip has a gap in human assets. Though their executives do have experience executing business plans, they are lacking experience in the RFID market.

Even though VeriChip has only a few resources, those resources can be profitable. In order to determine if their resources are potentially profitable, a VRISA analysis can be used to assess whether or not their current resources can lead VeriChip to have a sustainable competitive advantage over their competitors. Table 1.0 is an analysis of VeriChip's knowledge for making implantable RFID.

Table 1.0 VRISA Analysis: VeriChip's Knowledge for Making Implantable RFID

Attribute	Key Question	Answer	Reason
Valuable	Does VeriChip's knowledge for making an implantable chips give customers something that they value?	Yes	In an Emergency, VeriChip can provide healthcare workers with pertinent personal information when you can't speak, remember, or you're unconscious. ²⁰
Rare	Is VeriChip the only one with the knowledge to make this type of RFID? If not, is VeriChip's level of the knowledge higher than that of competitors?	Yes	VeriChip is currently the world's only implantable microchips for human applications.
Difficult to Imitate	Is it difficult for other firm's to imitate VeriChip's knowledge?	Yes	VeriChip's patent prohibits imitation during the life of the patent. ²¹
Non-Substitutable	Is it difficult for another resource to offer customers the same value that VeriChip's customers get from this Chip?	No	Though there are no other implantable chips, there are numerous non-invasive RFID chips out on the market
Appropriability	Does VeriChip make money from its knowledge of making the VeriChip?	Yes	Only VeriChip has the knowledge to make the chip. Their customers currently have no bargaining power of the firm
Result	Temporary Competitive Advantage		

VeriChip's resources are valuable, rare, and difficult to imitate but are substitutable. Since VeriChip has many competitors that have a substitutable product, they are already at a temporary competitive advantage. These competitors produce various substitutes that are non-

¹⁹ Kris Hundley, 2004, Scannable Humans complicate ideas of privacy, St. Petersburg Times, Nov 28 2004

²⁰ A Revolution in Healthcare Information Access, www.4VeriChip.com, April 18, 2005

²¹ Applied Digital Corporation, 2003, 2003 Annual Report, Delray Beach, FL

invasive which makes them more appealing to the healthcare industry. With these substitutes, VeriChip needs to find a way to make their uniqueness of implantability, non-substitutable in order to sustain their competitive advantage

First-Mover Advantage

Since VeriChip is the first to bring their implantable chip to the RFID market, they are able to take advantage of being a first-mover in the implantable RFID market. VeriChip has an exclusive license and patent for their chips use in humans. They are the only company that is pursuing the implantable RFID market. But being a first-mover has its advantages and disadvantages that come along with it.

By being a first-mover, VeriChip is being the first to offer the product to the market, which can help VeriChip buildup a loyal customer following as well as strong brand name recognition. VeriChip has established a relationship with their customers, and once installed in the customer it makes it difficult for the customer to switch to a similar product. VeriChip has also taken advantage of the economies of learning and scale. Since Digital Angel already has the technology, that knowledge has been passed onto VeriChip and they have learned and can easily move up the experience scale before competitors are able to enter the industry. They are also able to improve on production costs as they are the first to find ways to minimize costs.

There are also disadvantages that come with being a first-mover. As with any first-mover the acceptance of this chip may take some time. Many people are skeptical about having a chip put in their arm as it has never been done before. There is also a risk of a new technology. Since competitors can now purchase the VeriChip they can focus on what the VeriChip does and find ways to make it better. This also leads to higher development costs for a VeriChip. Though Digital Angel already had a similar product on the market, VeriChip still needs to tweak the product to make it their own.

Complementary Assets

There are two things that determine the extent to which a firm can profit from its innovation; inimitability and complementary assets.²² In the VRISA analysis, it was discussed that VeriChip's implantable RFID technology is very difficult to imitate. So that leaves complementary assets. VeriChip relies on their complementary assets that enable them to offer value to their customers.

VeriChip's complementary assets are associated with their position relative to their key industry factors. The main complementary asset that is associated with their key industry factors in brand name and recognition. As VeriChip is a first-mover they will be the first company to get their name out to the public. The third and fourth complementary assets focus around VeriChip's marketing and operational capabilities. In order to help understand these assets, there is a need to explain in more detail.

Marketing Capabilities

VeriChip has several approaches that help them in the market. They first narrowed down their target market in the healthcare industry. Through their distributors, they have then given away

²² Allan Afuah, 2004, Business Models, a Strategic Management Approach, New York, McGraw-Hill Irwin

complementary products to try and market their product out to hospitals and doctor's offices. They are also using this give away to promote their brand name.

Relationship with Buyers

VeriChip's marketing strategy is to form a relationship with their buyers and to narrow down their market to a target segment. They are focusing on those patients that have a common chronic illness that can impair communication at some time. This is because these patients may often have a communication barrier due to loss of consciousness, impaired speech, or memory loss. These symptoms can lead to delays in treatments or contribute to medical errors.

Complementary Products & Brand Equity

VeriChip offers two complementary products along with their VeriChip. The first product is the scanner. These scanners are not for individual use but for use of the emergency medical services, hospitals, or doctors offices. The second complimentary product is Global VeriChip Subscriber (GVS) Registry. This registry is for use of both the end user as well as the medical services.²³ These two complementary products are absolutely necessary to have in order for the VeriChip to work.

There are two types of scanners. First, there is a handheld proprietary VeriChip "Pocket" Scanner. The second kind of reader is the VeriChip Portal Reader. The pocket scanner has been designed for use as a point of contact for medical clinics and EMT vehicles. The scanner needs to be within 6 feet of the chip in order to read the chip. VeriChip is in the process of giving away these \$650 scanners to over 200 medical clinics and EMT's in the US in order to get their name out on the market. VeriChip understands that if the hospitals and clinics do not have the readers there is no need for patients to buy the VeriChips for themselves. The VeriChip Portal Reader is a freestanding "Portal" scanner that has been designed for use at the point of contact with subscribers and can be operated unattended. These scanners can read the VeriChip once the chip passes through the portal.²⁴

Figure 1.0 Pocket and Portal Scanners



The Global VeriChip Subscriber (GVS) Registry is a database that has all of a subscriber's medical history stored in it. Each subscriber is asked to pay a \$9.95 monthly fee for access to their information and to be able to keep their information up to date. Only information authorized by the subscriber will be available for access via the scanners by the medical centers. This can allow instant access to such vital information as allergies to medications, medical device implants, pre-existing medical conditions, and emergency contact numbers.

²³ [VeriChip sets May 1st Launch of New Global VeriChip Subscriber \(GVS\) Registry Service, www.adsx.com/news/2002](http://www.adsx.com/news/2002), April 9 2002

²⁴ [VeriChip Portal Reader, www.findmellc.com](http://www.findmellc.com), May 9 2005

Operational Capabilities

Currently, VeriChip leverages off of Digital Angel's operations. As Digital Angel produces the same chip for their animal division, VeriChip has outsourced the production for their chip to Digital Angel. This function has enabled Digital Angel to offset their overhead costs to VeriChip. VeriChip in return will get a quality production for lower cost than if they would produce the chip themselves.

Outsourcing

VeriChip has chosen to outsource two activities of their business system. The reason they have outsourced these functions is they feel that another business is able to deliver a better customer value. The two activities that they have chosen to outsource are distribution and operations.

VeriChip has chosen to outsource distribution for two main reasons, costs and network size. By having a company such as Henry Schein distribute the VeriChip, VeriChip can keep their fixed costs down. As VeriChip is new to the market it is very expensive and difficult to reach many customers with a small sales staff. By using companies like Henry Schein to distribute the chips, the chips will reach a wider range of customers as well minimize the cost to reach to those customers. Also, Henry Schein has much more knowledge in the area of medical distribution than VeriChip.

The second function that VeriChip has chosen to outsource is their manufacturing, purchasing, and maintenance of the VeriChip and its components. VeriChip has chosen to outsource these functions to Timely Technology Corporation, a company that was recently bought out by Digital Angel. Timely Technology Corporation is also the sole manufacturer and supplier for Digital Angel's chip for animals. They already had the knowledge and expertise in implanted chip technology manufacturing and maintenance.²⁵

Strategy Analysis

SWOT Analysis

VeriChip's resources and capabilities can be best viewed in a SWOT analysis. This SWOT analysis then can be used to leverage their strengths and opportunities to help minimize their weaknesses and threats. VeriChip's strengths are:

- *Patent for Implantable Chip* – VeriChip holds the patent for the Implantable Chip. This patent protects VeriChip from a competitor imitating the product.
- *Research & Development* – VeriChip has extensive R&D. They have the knowledge to make the product, as a similar product for animals has been on the market for several years.

²⁵ Digital Angel Corporation, 2004, 2004 Annual Report, Delray Beach, FL

- *Experienced Parent Company* – Applied Digital also owns Digital Angel. Digital Angel has the experience as an implantable chip company, but focused on the animal market.
- *Success of Digital Angel's Chip* – Digital Angel's implanted chip returns over 6,000 dogs and cats to their owners every month.²⁶ They sell 3 to 4 million chips annual, which generate revenue of almost \$70 million.²⁷
- *Proprietary Complementors* – VeriChip can make money three different ways. They can sell the chip itself, the pocket or portal scanners, as well as the monthly subscription to GVS. Currently the only scanners and subscription that works with the VeriChip is owned by the Corporation.
- *Distribution Networks* – VeriChip has teamed up with some of the top distributors in the world to distribute their product into the HealthCare Industry.
- *Acquisition of eXI Wireless* – eXI Wireless helps VeriChip compete in the external RFID market. The external RFID is much more widely accepted than the implantable kind.

An absence of certain strengths for VeriChip will make up their weaknesses. Here are VeriChip's weaknesses:

- *New Technology* – The VeriChip is such a new technology, that most people have not heard of it. Also, it may take longer for the VeriChip to be accepted by the general public.
- *Lack of Marketing* – VeriChip lacks a clear marketing plan. They are not focused on one industry but are just focused on what the product will do in the future.
- *Lack of Cash/Current Assets* – VeriChip just recently paid of their debt to IBM. As well, the only asset that VeriChip owns in their property.
- *Poor Past Performance* – In 2003, VeriChip only had revenues of \$550,000.²⁸
- *Small Network Size* – As of today, very few hospitals and EMT's even have he scanners to read the chips. If buyers know that their local hospital cannot even read the chip, they are less likely to get a chip implanted.

Table 2.0 SWOT Analysis for VeriChip Corporation

<p><u>Strengths</u></p> <p>Patent for Implantable Chip Research & Development Experienced Parent Company Proprietary Complementors Distribution Networks Success of Digital Angel's Chip Acquisition of eXI Wireless</p>	<p><u>Weaknesses</u></p> <p>New Technology Lack of Marketing Lack of Cash/Current Assets Poor Past Performance Small Network Size Temporary Competitive Advantage</p>
<p><u>Opportunities</u></p> <p>Growth Potential New Technology Movement in Other Industry's International Growth</p>	<p><u>Threats</u></p> <p>Privacy Advocates/Lobbyist High Number of Substitutes FDA Regulations for Other Industries Consumer Negativity</p>

²⁶ Smith, Geri, 2004, These ID Tags Get Under Your Skin, Business Week, Issue 3894, p77-80

²⁷ Murray, Charles J., 2004, Implantable Chips get Under Skin of Security Experts, Electronic Engineering Times, Issue 1331, p4-5

²⁸ Murray, Charles J., 2004, Implantable Chips get Under Skin of Security Experts, Electronic Engineering Times, Issue 1331, p4-5

- *Temporary Competitive Advantage* – VRISA Analysis shows that VeriChip only has a temporary competitive advantage at this point.

Being a first-mover opens opportunities for VeriChip. These new opportunities, if pursued, could generate profit and growth for VeriChip. VeriChips opportunities include:

- *Growth Potential* – VeriChip has a new and unique technology that is only in its beginning stages. If the product takes off, VeriChip will be a very profitable company.
- *New Technology* – VeriChip's constant R&D is leading the VeriChip in a direction to becoming bigger and better. They are looking into GPS capabilities that will allow a person to be found and the chip to be read from a far distance.
- *Movement in Other Industries* – The security and finance industries seem to have very large interest in the VeriChip. The security industry likes the chip because they are very difficult to imitate and with the portals they can easily track employee's whereabouts in a building. The finance industry is looking at these chips as a future replacement for credit cards or just another form of identification.
- *International Growth* – The chips seems to be growing internationally faster than in the US. In Mexico, the Mexican Attorney General at 18 men chipped so he could better control access to these men in his buildings. In Spain, a club owner implants the chips in his VIP members so they don't have to carry around money and can just pay by the scanning their chip.

As there are opportunities for being a first-mover, there are also many threats. VeriChip is in a rapidly growing industry, but an industry that is under a lot of scrutiny. VeriChips threats are as follows:

- *Privacy Advocates/Lobbyist* – There are a large number of privacy advocates and lobbyists against the implantation of the chip. There are many different theories about the chip, in which some believe that the government made the chip and are one going to control everyone's whereabouts, also many believe that this is the "Mark of the Beast" and the end of the world is about to come.
- *High Number of Substitutes* – As there are no implantable substitutes, there are many non-invasive solutions.
- *FDA Regulations for Other Industries* – Currently, the FDA has only approved this chip for use in the healthcare industry.
- *Consumer Negativity* – VeriChip's research states that 9 out of 10 people think the idea of getting implanted is "creepy".²⁹

²⁹ McHugh, Josh, 2004, [A Chip in Your Shoulder, Should I get an RFID Implant?](#), Slate, Nov. 10, 2004

Strategy

After looking at their SWOT analysis, VeriChip now needs to consider which strategies work best for them. In order to do this they need to exploit their opportunities in a way that neutralizes their threats. VeriChip can look into their growth potential, access to new technology, opportunities in other industries, and international growth to determine their next move.

The first alternative strategy that VeriChip needs to look into is their tremendous growth potential. VeriChip needs highly focus on spreading the word of the VeriChip to the healthcare industry. They need to continue to give out their scanners to EMT's and hospitals so it makes it easier for them to spread the word to their customers. By continuously giving away their products it will make it more difficult for hospitals and EMT's to justify buying scanners for a competitor's product.

The second alternative strategy is to improve the product. VeriChip needs to be continuously innovative and coming out with better alternatives for the product. They need to take advantage of the latest technology out there and make their product superior. If they can find beneficial ways to use their product it may limit the privacy advocates and the consumer negativity about the product. The better the media coverage and reputation the better the product will be in the marketplace.

The next alternative is to move into other industries other than healthcare. In order to do this they need to get the FDA to approve use in these other industries. The security and finance industries see many uses of the VeriChip for their purposes. In both industries the chips can act as a form of identification that is very hard to steal. They are also looking into finding a way for police officers to use the chips so that their gun will only go off by having the chip nearby.

The last alternative strategy is to take their growth internationally. Other countries are more open to new technologies. VeriChip could focus their attention to those countries that are more receptive and market their products there. This will help get their product out in the market and give countries that are a little slower to adapt to new technology a little more time to get used to the product.

To be successful and deliver the best customer value, VeriChip should consider all of these alternatives. But they also need to look at getting an immediate return on investment as they are a struggling company. Doing the last strategy of growing internationally combined with pursuing other industries would be their best bet. Foreign cultures such as Japan and Western European are more open to new technologies and testing these waters there first will give VeriChip a better understanding on how the product is going to succeed.

Financial Projections

Annual Revenues

Pricing Considerations

Although VeriChip initially will not have any direct competitors, it will have to substantiate the need for the product. The company has already formed a Medical Advisory Board to educate physicians, healthcare administrators, and consumers in an effort to gain increased acceptance. The board will also help coordinate efforts among regulators, agencies and lobbyist groups to promote the device and protect VeriChip's position.³⁰ VeriChip's marketing efforts will have to highlight product benefits, describe how it uniquely serves specific needs, and explain the advantages of implanted (rather than external) devices.

Since VeriChip will be the first to market with this type of technology, it should consider a skimming strategy to price its chips and scanners. By starting with higher prices, each unit sold will contribute more toward recovering fixed costs. Then, as new competitors enter, VeriChip should be able to lower its prices and maintain a competitive position. For now, as the only player, VeriChip stands to benefit from early learning about markets and distribution of its proprietary system.

Demand for the VeriChip system could also be impacted by complementary products. Medical facilities will need to have adequate information systems to meet the capacity requirements associated with the chips and scanners.

Estimating Demand

VeriChip has stated revenue goals of \$8-10 million for 2005. Revenue will come from three sources: microchips, scanners, and subscription fees. The company plans to sell the chips for around \$200 each and the scanners for \$650. Customers who get implanted will also be charged a subscription fee of \$9.95 per month.³¹

To estimate demand, we reviewed the growth of Digital Angel in the pet market, which sold 50,000 scanners over the course of 15 years. According to VeriChip, 50,000 scanners would translate to 1 million chips implanted in humans over a similar timeframe.³² This suggests a chip-to-scanner ratio of 20:1 for VeriChip. Based on this we projected three potential growth scenarios (see Appendix B). Using these projections, we estimate VeriChip will sell 1 million to 1.4 million chips in 15 years.

Cost Structure

VeriChip's fixed costs will likely be high, especially during the early years. In addition to ongoing research and development, the company will need to protect valuable resources, such as trade secrets, enhancement designs and employee knowledge. Legal and consulting fees could also

³⁰ VeriChip Forms Medical Advisory Board. Wireless News, www.10meters.com, Feb. 16, 2005.

³¹ Applied Digital's VeriChip Corporation Completes Acquisition of eXI Wireless. www.4verichip.com April 14, 2005.

³² McHugh, Josh, "A Chip in Your Shoulder, Should I get an RFID Implant?" Slate, Nov. 10, 2004.

be significant, along with lobbying efforts related to regulatory and activist groups. Finally, marketing costs will be considerable, as VeriChip seeks to forge a leadership position in a new market.

In addition, VeriChip is weighed down by high variable costs. Virtually all of its product-related activities (such as manufacturing and distribution) are outsourced. At the same time, it has yet to achieve learning curve benefits and economies of scale.

To estimate VeriChip's cost structure, we developed a list of benchmark firms to compare costs and margins as a percentage of revenue. Although VeriChip currently has no direct competitors, several firms offer suitable comparisons based on industry classifications, product types and operational structures. The benchmark companies are Digital Angel, eXI Wireless, Applied Digital, AXCESS International, Active Control Technology and Medtronic (see Appendix C).

Digital Angel, eXI Wireless and Applied Digital are most closely-related to VeriChip and provide the best comparisons. Aside from being implanted into animals rather than humans, Digital Angel's microchip identification system is essentially the same as VeriChip's; therefore, we

Table 3.0 Scenario Analysis Summary

	Conservative	Reasonable	Optimistic
YEAR 1			
Variable Costs	65%	60%	55%
Gross Margin	35%	40%	45%
Fixed Costs	75%	70%	65%
EBIT	-40%	-30%	-20%
YEAR 5			
Variable Costs	60%	55%	50%
Gross Margin	40%	45%	50%
Fixed Costs	70%	65%	60%
EBIT	-30%	-20%	-10%
YEAR 10			
Variable Costs	55%	50%	45%
Gross Margin	45%	50%	55%
Fixed Costs	65%	60%	55%
EBIT	-20%	-10%	0%
YEAR 15			
Variable Costs	50%	45%	40%
Gross Margin	50%	55%	60%
Fixed Costs	60%	55%	50%
EBIT	-10%	0%	10%

expect VeriChip's cost structure and growth to be very similar to that of Digital Angel.³³ Prior to becoming part of the Applied Digital family earlier this year, eXI Wireless had established itself as an RFID solution provider for human identification, asset management, and security applications.³⁴ As the parent company of VeriChip, Digital Angel, and now eXI, Applied Digital's strategic planning and overall success (or lack thereof) will significantly impact VeriChip.

AXCESS International and Active Control Technology provide good benchmarks of variable costs and gross margins, but both companies have had extremely high fixed costs (and very negative EBIT) in recent years. AXCESS International designs digital video equipment for security purposes, as well as RFID systems for tracking people, vehicles, inventory and equipment.³⁵ Active Control Technology produces security and access control devices, such as alarm systems, parking gates, and wireless transmitters.³⁶

Finally, Medtronic is less similar in terms of product mix and operational structure, but it provides good targets for costs and margins. It produces implantable biomedical devices, such as defibrillators, pacemakers, spinal implants and drug delivery systems. Clearly, it is a more

³³ Digital Angel Corporation, 2004, 2004 Annual Report, Delray Beach, FL.

³⁴ eXI Wireless Inc., 2004, 2004 Annual Report, Vancouver, British Columbia.

³⁵ AXCESS International Inc., 2004, 2004 Annual Report, Carrollton, TX.

³⁶ Active Control Technology, Inc., 2004, 2004 Annual Report, Mississauga, Ontario.

stable company, with lower fixed and variable costs than the rest of the benchmarks. In recent years, Medtronic has achieved cost reductions through facility consolidation efforts and by bringing certain manufacturing processes (which had previously been outsourced) back in-house.³⁷ This makes Medtronic a good role model for VeriChip, which is heavily outsourced, and Applied Digital, a company with multiple subsidiaries.

Based on these benchmarks and our demand estimates, we have developed a scenario analysis of VeriChip's expected profitability (also see Appendix D.)

Risk Analysis

Like many technology ventures, VeriChip is in a risky position. Its parent company, Applied Digital has struggled in recent years and is now focusing heavily on VeriChip. Both VeriChip and Applied Digital remain enthusiastic, despite a growing social debate. Some groups are mildly cautious, citing concerns about preventing identity theft and protecting personal privacy. Others are more passionately opposed, describing VeriChip as a Big Brother enabler and the "mark of the Beast." Such opposition increases risk, as it has the potential to draw unwanted attention from the media, politicians and regulators.

Addressing risks related to revenues will be a challenge. VeriChip is fortunate to have no direct competitors and carries the first-mover advantage. In addition, it is building barriers to entry through its patent, FDA approval and proprietary chip-and-scanner system. However, external devices continue to be perceived as viable substitutes by health care facilities and consumers alike. Moreover, despite being relatively affordable, VeriChip's products are not viewed as critical components for buyers. Institutional buyers such as hospitals do not see VeriChip's scanners as a key necessity for delivering high quality patient care. As for consumers, many are simply not convinced that "getting chipped" will provide significant benefits. Because of this, many of VeriChip's potential customers exert competitive forces in one of three ways: they do not understand the needs that VeriChip aims to serve; they meet their needs via other means; or they simply let certain needs go unmet.

VeriChip also needs to deal with risks regarding costs. Currently, Raytheon Microelectronics Espana, SA is the sole producer of microchips for Digital Angel and VeriChip.³⁸ This gives Raytheon significant bargaining power, and puts VeriChip at risk if demand increases and Raytheon is unable to produce the required additional quantities. On top of that, VeriChip is placing significant trust in Raytheon by giving it access to "secret" technology. VeriChip also must continue to invest in research and development to improve and maintain a competitive position. Finally, litigation and regulation could kill demand and/or drive costs up considerably.

Conclusion

VeriChip Corporation markets the world's first sub-dermal radio frequency identification device (RFID). The healthcare industry is one of the major markets being targeted for implementation of this advanced RFID technology. The very innovation that makes the product unique, implantability also raises a great number of issues that must be overcome if the VeriChip is going to be successful.

³⁷ Medtronic, Inc., 2004, 2004 Annual Report, Minneapolis, MN.

³⁸ Digital Angel Corporation, 2004, 2004 Annual Report, Delray Beach, FL.

Full integration of a product line to include implants and less intrusive external devices also now sold (via eXI acquisition) will be a key to widespread adoption of VeriChips in the United States. Many of the social concerns that surround VeriChip in the United States are culturally strong forces that are less prevalent in other parts of the world. This opens the potential for VeriChip to strongly pursue foreign markets and establish a performance history that can make implementation here more likely.

Financially, as the preceding report has detailed, VeriChip must work diligently to keep costs down and develop realistic market opportunities in order to remain viable in the years to come.

In the end, the success or failure of VeriChip may be more strongly rooted in their ability to develop high security markets where positive identification is crucial and some of the intrusiveness associated with the device appears more justifiable.

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Appendix A

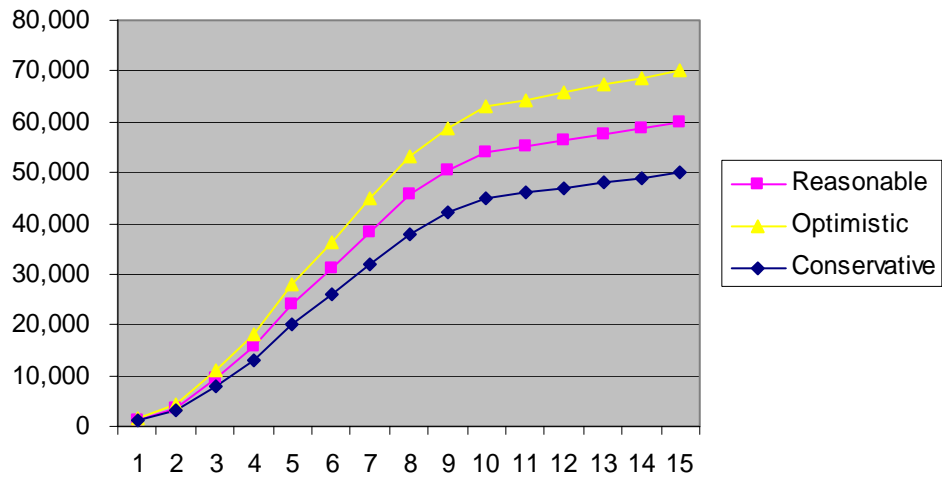
2004 Most Wired Hospitals Survey Results – (Top 100 Most Interested in IT) (Based on sampling of 1,298 hospitals)

<u>By Region</u>	<u>%</u>	<u>By # of Beds</u>	<u>%</u>
New England	4.1	6 - 24	5.2
Middle Atlantic	8.1	25 - 49	11.4
South Atlantic	17	50 - 99	18.8
East North Central	20	100 - 199	21.8
East South Central	8.6	200 - 299	16
West North Central	17	300 - 399	10
West North Central	11	400 - 499	5.7
Mountain	5.2	500 or More	11.1
Pacific	9.3		
<u>By Location</u>	<u>%</u>	<u>By Teaching Status</u>	<u>%</u>
Rural	31	Non-Teaching	65.5
Urban	69	Teaching	34.4

Appendix B

VeriChips Three Potential Growth Scenarios

Yr	Conservative	Reasonable	Optimistic
1	1,000	1,200	1,400
2	3,000	3,600	4,200
3	8,000	9,600	11,200
4	13,000	15,600	18,200
5	20,000	24,000	28,000
6	26,000	31,200	36,400
7	32,000	38,400	44,800
8	38,000	45,600	53,200
9	42,000	50,400	58,800
10	45,000	54,000	63,000
11	46,000	55,200	64,400
12	47,000	56,400	65,800
13	48,000	57,600	67,200
14	49,000	58,800	68,600
15	50,000	60,000	70,000



Appendix C

Benchmark Companies (Digital Angel, eXI Wireless, Applied Digital, AXCESS International, Active Control Technology and Medtronic)

2004	Digital Angel	eXI Wireless	Applied Digital	AXCESS Int'l	Active Control Tech	Medtronic Inc.	AVERAGE
% of revenue Variable Costs	56.6%	29.4%		48.2%	65.2%	24.8%	44.8%
Fixed Costs	46.0%	69.8%	Financials Not Yet Available for 2004	359.5%	134.6%	40.7%	130.1%
Gross Profit	43.4%	70.6%		50.2%	34.8%	75.2%	54.8%
EBIT	-2.6%	10.8%		-309.3%	-99.8%	34.6%	-73.3%
2003	Digital Angel	eXI Wireless	Applied Digital	AXCESS Int'l	Active Control Tech	Medtronic Inc.	AVERAGE
% of revenue Variable Costs	57.2%	28.4%	69.7%	61.4%	65.6%	24.7%	51.1%
Fixed Costs	59.3%	65.2%	73.5%	288.4%	201.7%	42.2%	121.7%
Gross Profit	42.8%	71.6%	30.3%	22.4%	34.4%	75.3%	46.1%
EBIT	-16.5%	10.3%	-42.3%	-266.1%	-167.3%	33.1%	-74.8%
2002	Digital Angel	eXI Wireless	Applied Digital	AXCESS Int'l	Active Control Tech	Medtronic Inc.	AVERAGE
% of revenue Variable Costs	59.7%	27.5%	59.1%	67.6%	55.7%	25.8%	49.2%
Fixed Costs	121.1%	63.0%	74.3%	303.2%	116.6%	45.3%	120.6%
Gross Profit	40.3%	72.5%	31.6%	24.0%	44.3%	74.2%	47.8%
EBIT	-80.8%	19.4%	-40.2%	-279.2%	-72.4%	29.0%	-70.7%

Appendix D

Scenario analysis of VeriChip's expected profitability

	Conservative			Reasonable			Optimistic		
	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue
YEAR 1									
Scanners	650	1,000	650,000	650	1,200	780,000	650	1,400	910,000
Chips	200	20,000	4,000,000	200	24,000	4,800,000	200	28,000	5,600,000
Subscriptions	120	20,000	2,400,000	120	24,000	2,880,000	120	28,000	3,360,000
			7,050,000			8,460,000			9,870,000
Variable Costs		65%	4,582,500		60%	5,076,000		55%	5,428,500
Gross Margin		35%	2,467,500		40%	3,384,000		45%	4,441,500
Fixed Costs		75%	5,287,500		70%	5,922,000		65%	6,415,500
EBIT		-40%	(2,820,000)		-30%	(2,538,000)		-20%	(1,974,000)

	Conservative			Reasonable			Optimistic		
	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue
YEAR 5									
Scanners	650	20,000	13,000,000	650	24,000	15,600,000	650	28,000	18,200,000
Chips	200	400,000	80,000,000	200	480,000	96,000,000	200	560,000	112,000,000
Subscriptions	120	400,000	48,000,000	120	480,000	57,600,000	120	560,000	67,200,000
			141,000,000			169,200,000			197,400,000
Variable Costs		60%	84,600,000		55%	93,060,000		50%	98,700,000
Gross Margin		40%	56,400,000		45%	76,140,000		50%	98,700,000
Fixed Costs		70%	98,700,000		65%	109,980,000		60%	118,440,000
EBIT		-30%	(42,300,000)		-20%	(33,840,000)		-10%	(19,740,000)

	Conservative			Reasonable			Optimistic		
	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue
YEAR 10									
Scanners	650	45,000	29,250,000	650	54,000	35,100,000	650	63,000	40,950,000
Chips	200	900,000	180,000,000	200	1,080,000	216,000,000	200	1,260,000	252,000,000
Subscriptions	120	900,000	108,000,000	120	1,080,000	129,600,000	120	1,260,000	151,200,000
			317,250,000			380,700,000			444,150,000
Variable Costs		55%	174,487,500		50%	190,350,000		45%	199,867,500
Gross Margin		45%	142,762,500		50%	190,350,000		55%	244,282,500
Fixed Costs		65%	206,212,500		60%	228,420,000		55%	244,282,500
EBIT		-20%	(63,450,000)		-10%	(38,070,000)		0%	0

	Conservative			Reasonable			Optimistic		
	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue	Unit Price	Quantity	Revenue
YEAR 15									
Scanners	650	50,000	32,500,000	650	60,000	39,000,000	650	70,000	45,500,000
Chips	200	1,000,000	200,000,000	200	1,200,000	240,000,000	200	1,400,000	280,000,000
Subscriptions	120	1,000,000	120,000,000	120	1,200,000	144,000,000	120	1,400,000	168,000,000
			352,500,000			423,000,000			493,500,000
Variable Costs		50%	176,250,000		45%	190,350,000		40%	197,400,000
Gross Margin		50%	176,250,000		55%	232,650,000		60%	296,100,000
Fixed Costs		60%	211,500,000		55%	232,650,000		50%	246,750,000
EBIT		-10%	(35,250,000)		0%	0		10%	49,350,000