THE ROLE OF MOBILE TECHNOLOGY AND ELECTRONIC HEALTH RECORDS IN THE DELIVERY OF HEALTHCARE

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Abstract:

The passed 10 years have brought about immense change both in the composition of society, and factors (like technology), which function to facilitate our lives. Over this time, technology has seen major improvements in its computational and statistical abilities. These improvements in the abilities of technology, and especially mobile technology have opened the door to a wide variety of software systems and apps that can be used to improve healthcare. Currently apps are being used in conjunction with other devices like sensors and monitors to battle some of societies worst issues, like diabetes, smoking related illness, and even the ever growing geriatric population—and are doing an admirable job. The potential benefit of these devices has even been observed by healthcare providers, who are trying to get patients health records on their mobile devices. This would allow patients to actively participate and monitor their own healthcare. These health records would also benefit the entire healthcare industry by simplifying the transfer of information, and speeding up the overall delivery of healthcare. These improvements are necessary as the population continues to grow, necessitating new ways to efficiently deliver medical care.

Over the course of the last ten years society has experienced an exponential increase in the proliferation of technology, in a wide variety of sectors. Ranging from education, in the forms of electronic textbooks, and online lectures, to getting directions through online maps—technology has integrated itself into a myriad of niches. Perhaps one of the most beneficial sectors technology has integrated itself into, is healthcare. The technological overhaul present in the healthcare industry has been very broad. One example is new software technologies that are allowing hospitals to create better structure, and information monitoring throughout the various hospital sectors. These software technologies have themselves grown so large, that they are now capable of; facilitating the transfer of healthcare information, consolidating patient records, increasing the processing speed of patient information, and most importantly increasing the speed and convenience with which patients receive healthcare. The aim of this paper is to analyze the relationship between different mobile technologies and electronic health records, which are one type of software technologies. It is presumed that in conjunction with mobile technologies like cellphones and tablets, patient health records will be far more accessible to patients and will serve to facilitate the delivery of healthcare as a whole.

In 2005, experts estimated that the United States were at least 12 years behind other industrialized nations, in terms of spending on Health Information Technology (HIT). Canada for example spent the most per capita on HIT, at around $21 whereas the United States lagged far behind at a paltry 43¢ per capita (Hoyt et. al 20). The detrimental effects that result from this lack of spending are evident in terms of inadequate informational training and expertise of the workforce. It has been estimated that to create and maintain information technology, there will be a need of over 50,000 skilled workers over the next 5

years alone. Cost however cannot be ignored, as maintenance of information technology for these 5 years is expected to cost around $156 billion with an additional $48 billion for operational expenses (Hoyt et. al 21).

While computers have evolved to the point of automation and almost independent analysis, why focus on mobile technology in the delivery of electronic healthcare? The answer to that is simple; in the world there are around 5.8 billion cellphone users, with the United States contributing about 326.4 million of those subscribers (Masterson 1). Cellphone usage has become so integrated into our everyday lives, that 44% of cell phone users claim to sleep next to their phone. Even more shocking are the 29% of cellphone users who claim that their cellphones are the one personal item that they could not live without (Mobile Technology Fact Sheet 1). While cellphones have been around for a while, they have slowly developed their market share. Perhaps even more surprising than the cellphone, is the current star in the mobile technology industry: the tablet computer. These tablets possess many of the features present in cellphones, with larger displays and apps that generally have tablet specific optimization. Tablets have also developed a significant market share among consumers, as 50% of US households currently own tablets with this number expected to increase to around 130 million users by the end of 2014 (U.S. tablet owners to increase to 130 million 1). While mobile technology has certainly established itself in society over the passed decade, there are many aspects of this technology that may lead to future growth.

Today, we live in an era where the technological capabilities of phones and tablets are growing at an exponential rate. Moore's Law states that number of transistors on a computer chip doubles every 24 months—leading to much higher processing powers

(Moore's Law Growth and Technology 1). These processors are so powerful in fact, that some of today's top end phones like the Samsung Galaxy S4, have the same computing capabilities as low-end desktops being sold. Having more processing power sounds great, but how does mobile technology benefit from this increased power? Take a second to think about your phone or tablet, these devices now come standard with a wide array of features like GPS, proximity and ambient light sensors, accelerometers, barometers, temperature gauges, humidity sensors, infrared sensor, and even dual cameras (Bajarin 1). The combination of these features allows our mobile devices, to function as much more than just phones or portable Netflix players.

Perhaps the most adaptive features to accompany mobile technology are the wide array of attachments and devices that can work in conjunction with the phone/tablets capabilities. The number of wearable sensors that transmit information to mobile technology is expected to grow to around 400 million by the end of 2014. This growth in wearable sensors has only recently become possible, as mobile technology has become increasingly low-powered. Many of the major phone developers are integrating programming, making devices that are not active most of the time, but only wake up to transmit info and then go back to sleep. It has been estimated that devices that are "awake" 1% of the time and "asleep" 99% of the time last between 12 hours and 3 years longer depending on the device. (Adibi 588-593). Bluetooth is currently being used for many sensors as the standards for transmitting information wirelessly, but it is not thought of as a long-term option due to high transmission powers and high duty cycles (NFC vs. Bluetooth 1). Some alternatives that have been considered are RFID tags, and NFC (near field communication), which is technology championed by Samsung that sends information

via magnetic induction. However even these alternatives are limited in that they have a very limited range of usage, and one must be within a certain distance from the devices to send and receive information.

Technological limitations aside, these sensors are important, because they can use features like a phone/tablets GPS and reminders to keep logs of personal activity and behavior, for monitoring and analysis. An additional and perhaps overlooked benefit these additional devices have is that they assist users in achieving the ultimate goal of Electronic Health, which is to achieve the most benefit in the shortest period of time (Adibi 587)

As is the case with most innovators, there is significant risk to produce a unique product (especially in technology), however succeeding allows the individual to capture a large initial market share in relation to competitors. It is therefore not surprising that many companies over the past few years have been specializing in the production of wearable technology that may transmit information to a user's mobile devices or even online database. While small Kickstarter type companies initially captured the market, enough time has elapsed where the proverbial "Big-Boys" have begun to enter the industry.

There was a lot of publicity around the initial unveiling of Google's Glass eyewear, which was promoted as a device allowing people to live like Robert Downey Jr's Ironman character. While not quite at that level yet, developers have gotten their hand on the glasses and begun to apply their FiberOptic technology to the Healthcare industry. For example Augmendix, which is the largest Google Glass related startup, has integrated hardware that allows doctors to verbally question and access Electronic Health records as well as input information (if the hospital or clinic has installed EHR's). The technology has the potential to be heads up and hands free, facilitating the ease and delivery of medical

treatment (Kutscher 1). One of the major factors making Augmendix a leader in this industry is the fact that their service is HIPAA compliant and is therefore Government authorized. Some Hospitals have even started to beta test with Google Glass and have begun placing QR codes onto the wall of the ER. These codes can be read by eyewear and act as quick responses to patients waiting for treatment. One other company worth mentioning, that is operating in the Google Glass related space is Pristine. This company uses the eyewear to allow physicians to live stream cases to colleagues, which could be especially useful in teaching residents or conducting risky operations. They also use the eyewear through CheckList, which is a patient safety tool that helps physicians cover their bases in specific situations—making sure the right symptoms and conditions are considered before making key diagnoses (Samani 1).

Albeit Google Glass is a relatively new technology that is being adapted to the Healthcare industry, the use of mobile technology to battle societies ailments is not as new. Type 2 Diabetes is one of the most common diseases in the United States, and the incidence rates are only rising as a result of our hearty diets. Type 2 Diabetes is not something an individual is born with, but eventually develops as a result of various factors (diet, exercise, genetics). Currently, about 25.8 million (8.3%) of Americans suffer from this disease with about 2 million more Americans diagnosed every year (Fast Facts: Data and Statistics about Diabetes 1). Perhaps even more staggering than the number of individuals suffering from Diabetes, is the cost is takes to manage and diagnose individuals with the disease. In 2012 it was estimated that the total cost of diabetes was around $245 billion, which included $176 billion in direct medical costs and $69 billion in loss of employee productivity (disability, work loss, premature mortality) (The Cost of Diabetes 1). Overall the cost for

people diagnosed with diabetes consumes $1 in every $5 spent on healthcare. Once again mobile technology has a solution to alleviate some of the financial burden of this disease.

There are now many apps both on the Android and Apple stores that can be used to monitor blood glucose for type 2 Diabetes. These self monitored blood glucose levels can be tracked along with diet, exercise, and medicine and are generally interpreted easily by healthcare providers. In a study of the ten most salient Diabetes management apps, it was concluded that the ability to record, analyze, and simultaneously share/obtain feedback using an iPad or iPod Touch may provide the most benefit for patients. The app that received the best reviews from the study was called Wavesense. One of the crowning features of this app is the 256-bit encryption that is in concordance with HIPAA, there are few diabetes apps on the market that have these qualifications. In addition, for an extra price, the app comes with an external sensor that can independently track blood glucose and can even upload to an online database for physicians/nurses to analyze if the patient is severely at risk (Tran et. al 173-178). These aspects of Wavesense, certainly show potential to significantly decrease the amount of money spent on Diabetes. If patients can get advice on how to alter their lifestyles from apps without having to visit physicians, time can be spent treating patients with other diseases as well as eliminate the useless "5 minute checkup." One of the overlooked aspects of this app, and many like it, is the reminders feature, which sends textual reminders to encourage Diabetes patients to walk at least 45 minutes per day. Simply walking 45 minutes per day can reduce diabetes related healthcare spending by almost $1000 per year (Yogendra 1). On the other hand, monitoring diabetes has also shown to have potential for reducing annual employee related healthcare costs by about $3300 per person. While these decreases in spending seem

paltry compared the total, when multiplying the per person savings with the amount of people suffering from Diabetes, it is safe to conclude that these apps are certainly making a difference. While the effects on Diabetes are considerable, it isn't the only widespread disease for which mobile technology is making a noticeable dent in spending.

Diabetes management is certainly a big step in the integration of mobile health and manageable diseases. Yet Diabetes does not carry the notoriety of one of the most dangerous, yet highly used products around the World—cigarettes. These chemically laced causes of respiratory illness account for almost 440,000 deaths per year, and are considered the number one preventable cause of death on the planet. An interesting statistic that not many are aware of is the fact that one packet of cigarettes averages around $6, but results in $35 worth of Healthcare spending due to wide impact of cigarettes (emphysema, bronchitis, and even diabetes). As a result, just like with the diabetes movement, there has been a concerted effort to reduce the number of smoking related casualties. As a result mobile health technology has once again answered the call, with almost 700,000 smoking prevention app downloads on the Google Play store alone (Moore 1). An analysis of these apps showed many features in common, that could be used to alter the lifestyle and wellness of cigarette users. Many of these features were similar in respect to the features found on diabetes management apps. For example calendars to set quit dates, and schedule reminders that can be texted to users phones. Logs to track daily cigarette usage, along with visual figures showing how much money saved on foregone packs. Some of the most useful features as stated by app users are the phone numbers for cigarette or cancer awareness hotlines, where users can call and talk to people in times of need (HHS.gov 1). While there were varying statistics on the amount of money saved by

Healthcare providers as a result of smoking cessation apps, it was identified that individuals could save as much as $20,000 by stopping smoking (Cohen 1).

Smoking and Diabetes are two ailments whose effects have had significant impact on the quality of human life, however mobile technology can be used to relieve some of these impacts. Another group who may serve to benefit from mobile health technology is the rapidly growing senior citizen community. Estimates have described that by 2030, the population of older adults (65+) in the United States will be double the population from 2007 (The Older Population of the United States: 2012 1). The large increase in elderly citizens coupled with potential shortages in nurses, primary care physicians, and geriatric healthcare employees will certainly strain US healthcare in years to come. Healthcare researchers have been testing sensor technology using passive monitoring in conjunction with clinical information to enhance clinical decision-making. The goal of these sensor systems is use to capture information from the geriatric patients and couple this information with health history from EHR's to identify problems earlier, and offer more timely treatments. The University of Missouri was one of the first research institutes to test these sensors in an assisted care living center called Tigerplace. In this center, the University researchers outfitted the patient's apartments with a video sensor network, bed and motion sensors, along with physiological monitors or heart conditions and breathing (Alexander, Miller, et al 13-15). Though their experiment with the sensors, the researchers found that the mobile technology provided a lot of information about the health of the patients. While many may think the more data the better, the researchers found it difficult to filter out data deemed unnecessary to promoting the health of these patients. However their research did show that isolating key factors or red flags in terms of recurring diseases

certainly allowed physicians to make better diagnosis, and provide faster treatment (Alexander, Miller, et al 16).

As described to this point, Mobile Technology has and will continue to have a momentous impact on society—especially as we continue to rely more on technological advances. In regards to technological advances, none may be more beneficial to users and providers alike than the widespread adoption of Electronic Health Records or EHR's. These are healthcare systems, which are essentially electronic versions of a patient's medical history, maintained by healthcare providers. Essentially all necessary information, ranging from "demographics, progress notes, problems, medications, prior medical history, immunizations, and lab data," are synthesized and stored together in one online database for access (Electronic Health Records 1). These EHR's could be revolutionary for the Healthcare industry as some metrics predict savings of almost $77.8 billion annually, which amounts to almost 5% of total health expenditures (Baron et al. 222).

Based on this description and potential of EHR's, it is fairly easy to see how widespread implementation could ultimately benefit the Healthcare industry. For example if a Nation wide system were established, it would certainly benefit both the convenience and speed of Healthcare delivery both from providers and users. The consolidation of records would also facilitate Doctors and Nurses jobs in analyzing past trends and current ailments. EHR's would also provide much faster processing of patient information and quicker transfer of healthcare information between Healthcare providers—the goal as mentioned earlier is to provide the most benefit in the shortest period of time. On the other hand, as is usually the case, there are also significant consequences about EHR implementation that must be mentioned. Some of the ardent anti-EHR pundits ask

consumers to look at the fidelity of technology and technological systems, and ask whether we can trust these systems with our most confidential information? For example the implementation of EHR's would certainly decrease some of the privacy of medical information, by placing it online. With the quality of hackers and high occurrences of identity theft, this is a major risk. In addition, technology is not 100% consistent (think about anytime a program freezes), and data loss is a vital factor to consider (Hoyt et. al 173). However, many people are in agreement that the biggest challenge faced by the implementation of EHR's is the lack of synergy between Healthcare providers at the start. There is certainly going to be a period where some clinics/hospitals use EHR's while others who are devoid of the system struggle with delivering information between each other, simply due to system incongruence.

System incongruence is an issue that can only be resolved by setting standards for all relevant Healthcare providers to adhere to, thereby making EHR's mandatory. The setting of such standards would certainly expedite the Nation wide switch to an EHR based system. In order to facilitate the implementation of the EHR system, the government passed the Health Information Technology for Economic and Clinical Health Act (HITECH) of 2009. Through this act, the government has authorized payments through Medicare and Medicaid to healthcare facilities, both private and public, when they use Electronic Health Records to develop "specified improvements in healthcare delivery." (Blumenthal and Tavener 501-503). In terms of specifics, the federal government has committed unprecedented amounts of funding for the adoption of EHR's. These payments based on certain incentives are estimated to total up to $27 billion and can be divided to $44,000 through Medicare, and $63,750 through Medicaid per clinician. The legislation of this bill

however, ties the distribution of these incentive payments to determined "meaningful use." During the inception of this act, there were 23 objectives for hospitals and 25 objective for clinicians; with 10 additional objectives to be implemented by 2011-2012, these qualifications have become more refined since then. The qualifications come in three stages, each with increasing requirements for participation such as use of EHR's for 90 consecutive days in stage 1 (which lasts 2 years), and one year straight of EHR usage in stage 2 (ARRA-HITECH Act and Meaningful Use 1). One unique aspect of stage 2 of meaningful use is that healthcare providers must provide their patients the ability to view their health information online within 4 days of the information being available to the physician. An additional mandate is that at least 5% of a practice's patients can access their health information online (Bendix 1). Based on estimations from data collected at the end of 2013, figures show that the government had paid around $15.88 billion through this Act (Conn 1).

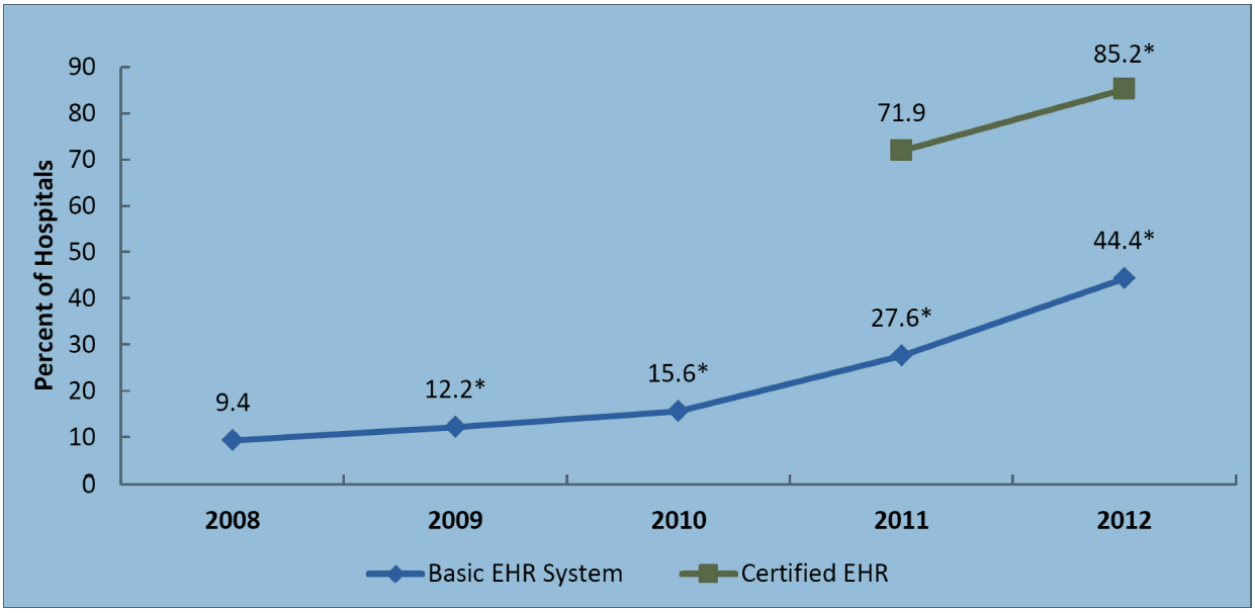
Even though the HITECH act exhibits the governments commitment to expedite the implementation of EHR's, the real question is how effective is this act? In the United States, about 78% of physicians practice in groups of 11 or fewer, in order to effectively integrate EHR's, these small practices must be targeted (A Survey of America's Physicians 13). Based on data provided by a surveyed group of internal medicine clinics from Philadelphia, the average cost of an EHR system, including: hardware, software, training, and 1 year of support, amounted to around $140,000. These clinics also mentioned similar issues they had when switching from a paper-based system to an EHR system. For example, there was a redesign of office workflow especially in the form of prescription filling/refilling, and sending/receiving lab results. Some of these clinics also found compatibility issues in

regards to directly integrating reports from specialty clinics into their EHR system. One clinic that was interviewed explained that it took about 4-6 months of stressful accommodation before patient waiting time improved, and staff were more confident using the system. From a clinical physicians perspective, 35% who were interviewed explained that there were two main benefits to using EHR's (Baron et. al 225-226). One is that the software allows the physicians to see more patients in the same time. The other is that physicians can more reliably delegate work to clinical teams due to the EHR system providing clear, timely, and legible documentation to support team activities. Overall there has been a noticeable increase in the amount of private office healthcare providers integrating EHR's, with the number up to about 39% in late 2011 (How Many Providers have Implemented EHR's 1).

While significant gains have been made by private practices since the passing of the HITECH act, there are some trends to take note of in regards to EHR adoption by these private clinics. For example EHR adoption rises as the number of physicians practicing at each practice rises. Offices with three to five practicing physicians had 69.6% adoption, while offices with 11 to 25 practicing physicians had 78.1% adoption. Adoption rates also rise as the number of exam rooms at each clinic rise. Clinics with one to ten exam rooms had 39.7% adoption, while offices with 11-plus exam rooms had 74.8% adoption. Finally, adoption rates rise as the number of patients seen at each clinic rises. Clinics with 1-50 patients per day had adoption rates of 57.5, whereas clinics with 100 patients or more per day had a 76.3% adoption rate. Finally adoption rates have also been found to vary between different medical

specialties. Physicians specializing in dialysis and kidney function had the highest EHR adoption rates of around 80.6%, whereas pathology was among the lowest in terms of EHR adoption at around 69% (Milliard 1).

In terms of hospitals the trends for EHR adoption are fairly similar to those of private practice adoption, with a year-by-year increase in users. This trend is depicted in the below, courtesy of Dustin Charles, Jennifer King, Vaishali Patel, and Michael Furukawa of healthit.gov.



`The benefits of EHR's in hospitals however are slightly different than those present to private practices. The implementation of EHR's in hospitals have more potential impact than those of private practices, simply due to the discrepancy in patients seen by both Healthcare providers. In hospitals for example, between 44,000 and 98,000 Americans die each year as a result of preventable medical errors (this adds up to total costs of between $17 billion and $29 billion per year for US hospitals) (Altuwajiri 330-335). The integration of EHR's can certainly combat this hefty spending by benefiting various sectors of the

hospital. For example physicians will benefit through electronic orders preventing the wrong interpretation of hand-written orders. While also providing physicians with full control over the ordering process, with the ability to adapt to real time alerts like drug allergies. The Pharmacy will also benefit, as resources will be freed up from administrative tasks and more time can be devoted to the clinical aspect of patient management. Finally, Hospital management serves to benefit as EHR's allow information to move instantly around the hospital. The EHR's also reduce the turnaround time for medication delivery, and scheduling routine tasks and exams—freeing up some of the administrative costs. Finally the EHR's will standardize the healthcare process, allowing health data and knowledge from various hospitals/clinics to be combined to facilitate public health research as well as examine current health trends (Altuwajiri 335-339).

As a result of time constraints and busy schedules, most people don't have the time to get regular checkups, ultimately leading to preventable deaths. While EHR's may seem just like online databases for Healthcare providers to enter information, these systems are far more complicated, with the future holding much more in store. For example researchers are working on an algorithm based on the Analytic Hierarchy Process. This system has had some success assigning disease coefficients and relative weights of certain risk factors in specific illnesses. This would be a game changing system as currently many diagnoses are based on physician's personal biases as they assess certain symptoms to be more important than others (Alepis, Lambrindis 1). While this system, based on the Analytic Hierarchy Process, is not the only system, which makes decisions based on online database information, others have taken it a step further.

Other research teams have taken these automated systems one-step further to

combat new and unique challenges in healthcare. For example work has been put towards improving the diagnosis of internal illnesses using computerized healthcare records and a neural-networks algorithm. Usually diagnosing these internal illnesses takes the most time and money of any type of diagnosis. These artificial neural networks are the key to promoting both efficient, and accurate diagnosis. Striving for efficiency and quality is admirable but only possible through use of physician reports and evaluations to aid in the delivery of healthcare. It's impressive how these neural networks provide more concentrated and specific alternatives that a person may be suffering from—allowing doctors to consider a broader range of possibilities. Due to the amount of information that is analyzed and evaluated by these neural networks, these systems demand a lot of processing power and memory. As mentioned earlier, Smartphone are in an unprecedented era in terms of their technological development. Now that phones have the CPU power, memory, and high networking capabilities to support these neural networks, they are beginning to pop on phones. A few patients were given the opportunity to beta-test this system, their phones with the neural networks had the ability to upload information straight to an online database for nurse/physician analysis. For security purposes, the patients were given unique usernames and passwords where they could login to secure networks to view doctor's diagnosis, or to upload pertinent health information (Bayraker et, al 1).

As mentioned earlier, one of the prime concerns with electronic health, and especially storing confidential information like Electronic Health Records on mobile devices is security. There are few things people consider as confidential as health information, and there are many examples of patient's medical histories being stolen from

online databases. Take Blue Cross, Blue Shield of Tennessee, where 57 hard drives of confidential data were stolen. Or even Healthnet.com, where the company revealed losses of 1.5 million online health records (Hoyt et al. 174). Mobile technology poses unique security issues compared to their desktop rivals. This is because mobile technology is more vulnerable to data attacks due to their large code base and complexity (Dmitrienko, et al 365-369).

One solution to secure mobile technology is using an e-wallet, much like is found for bitcoin users, which would store the user's authentication information and safely connect to ehealth servers for the user. The wallet would run through an application that could only be accessed through the EHR users mobile device, thereby preventing an outside user from accessing the information. In addition, the wallet would store the patient's username and password and automatically log the user in to their EHR thereby preventing the user from entering their access information into fake sites, or malware programs (Dmitrienko, et al 365-370). Another idea that has been proposed but has not gained, as much traction is the notion of developing a secure browser specifically for accessing online medical information. This browser, like the wallet would only be accessible through a patient's mobile device. While both of these ideas are novel approaches, one idea to consider is what happens if the patient's mobile device is lost or stolen. Some sources proposed the idea of adding a unique second layer of encryption, used to login in to the wallet or browser, however there was no consensus on this or even the most effective method to secure mobile technology. Albeit most sources claimed that accessing mobile health records should be done through a Virtutal Private Network, which is essentially a system that isolates users from WiFi network attacks (Marble Security 1).

As mentioned previously, security and interoperability have been the two main issues faced by the rapid and widespread adoption of EHR's. One system that has effectively responded to both of these challenges is the Blue Button initiative run by the United States Office of Veterans Affairs (VA). The main goal of this system is to provide users with easy online access to their medical information, and now utilized by over 500 private and public institutions, and can be accessed by over 100 million individuals (Rupp 1). In late 2013, the Blue Button system was elevated to stage 2 in the meaningful use act and was effectively allowing users access to their EHR's both on mobile and desktop systems. The Blue Button system has some very unique features designed to benefit the Veteran population, and their families. For example, most Medicare patients on average see 7 different physicians per year, with only about 30% of these physicians able to transfer health information between providers (Rupp 1). Because the Blue Button system is operated by Veteran's Affairs, in conjunction with Medicare and Medicaid, the providers using this system have an EHR system that is interoperable and standardized to share information. This allows the patients to quickly see their health information and share updates between primary care and specialty physicians.

Systems like Blue Button are undoubtedly the future of healthcare, and may be the first step in providing efficient healthcare to an ever-changing population. These systems and their benefits are clear, and if not now, will certainly be necessary as society continues to stratify with the aging of baby boomers and the unprecedented population growth currently being exhibited across the globe. Many consumers are taking notice of mobile technology and the potential benefits of systems like EHR's, as 41% of US consumers have expressed their willingness to switch physicians if they could get access to EHR's. This is

not that surprising however, as only 36% of US consumers currently have access to these types of systems (Bendix 1). While this number may be low now, as more private and public healthcare providers permanently make the switch to EHR's, the number of consumer users will also increase. The proliferation of these systems will also answer some of their biggest questions, as security of these systems improves, and interoperability becomes widespread. It is unlikely that society will see its reliance on mobile technology decrease at any point in the near future, especially with the drastically improved capabilities of these devices. Historically speaking, improved technology is generally coupled with improvements to human society (take electricity, cars, or even the internet as examples). The same can be said for the integration of health and mobile technology, as the combination of these systems will certainly facilitate and improve the delivery of healthcare.

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