OUTSTANDING SCIENTIST OF THE YEAR 2006

Rogel Patawaran, BS

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ABSTRACT: Rogel Patawaran is cofounder of iQSecure Solutions, Inc., a secure web mail company, which began in 2002 and is currently based in Santa Monica, California. Its unique service enables hospitals, clinics, and doctors' offices the opportunity to have secure web-based video and telephone conferencing by simply switching online services offered by this innovative company.

In addition, he is cofounder of AuthoTecq, based in Long Beach, California, and inventor of the AuthoTecq system in 1999. The AuthoTecq system is an online credit card processing company. Rogel Patawaran sought to remedy one of the problems facing users of internet transactions. Because internet merchants act as their own gateway for financial transactions, they have been storing credit card numbers in their own databases, thereby failing to address the necessary security provisions involved in the storage of such sensitive information. AuthoTecq removes this responsibility from the merchant by processing financial transactions on behalf of the merchants. Its system dramatically reduces credit card theft, and thereby decreases the amount of credit card fraud.

In his landmark book Saving Lives & Saving Money, Newt Gingrich, former Speaker of House of Representatives, describes a new approach to the challenge of creating a better system of personal health and health care for the 21st century, a system that saves lives and saves money. He indicates that you could be visiting a

clinic with electronic medical records, electronic laboratory reports, and electronic drug prescriptions. This entirely electronic clinic saves money and lives because it is far more accurate than a paper system. Such clinics exist at the Kaiser Permanente Hospitals, the Mayo Clinic in Jacksonville, Florida, the Cleveland Clinic, many Harvard hospitals, and all Veteran Administration hospitals in the US. He indicates that healthcare is the only industry in America that can give you a disease and then charge you to cure it. He further reports that out of 100 hospital patients, five or six will be the victim of a preventable error. He states that medication errors alone kill 7000 people each year, adding $2 billion to the overall cost of healthcare. He stresses that these 7000 needless deaths are not only unacceptable but un-American as well.

During the 1990s, the pharmaceutical industry sought help from the Food and Drug Administration (FDA) to develop a standard by which a paperless system could be adopted for healthcare. In March of 1997, the FDA issued its final ruling, which established the criteria for which the FDA will recognize the transmission of authenticity within electronic data as well as establishing standards of authenticity for electronic data equivalent to the validity of signatures on paper documents and records. The FDA also recognizes the growth that can be experienced by converting healthcare technology to a paperless system, such as the expediting of patient files in a more organized manner, increasing the speed of file transfer of such documents, reducing prescription errors, enabling computer-generated data analysis and statistics, and reducing storage space.

Rogel Patawaran and his colleagues also realized that electronic healthcare technology using the highest standard of data encryption to transfer data could also dramatically improve the safety of patients in our nation and the world. To answer the needs within healthcare technology, Rogel Patawaran created a system for healthcare providers using the most superior encryption methods, and in the process creating iQSolutions, Inc. Its web mail system uses the Public Key Infrastructure (PKI) format, which is the strongest known encryption format. PKI is used in combination with the Advance Encryption Standard (AES) digital encryption algorithm, which is the current algorithm used by banks and government agencies, thereby protecting the privacy and accuracy of the information. Rogel Patawaran's remarkable contributions to the encryption process will aid in the number of lives saved as well as helping to avoid medical malpractice by ensuring the accuracy of medical records, as well as reducing the number of medication errors or inappropriate prescriptions being filled.

These remarkable accomplishments in patient safety are accomplished at a rapid speed that ensures that data-sensitive patient files can be securely transmitted between and within hospitals. Finally, with the growing need for an electronic system within the medical field, doctors will be able to securely access all such data from anywhere and at any time, thus reducing the age-old problem of time constraints that a paper system presented doctors and hospitals alike. In recognition of Rogel Patawaran's contributions to the medical field through the use of encryption teamed with the transferring of sensitive data such as hospital records, Rogel Patawaran has been selected as the Outstanding Scientist of 2006.

I. INTRODUCTION

Rogel Patawaran is cofounder of iQSecure Solutions, Inc, a secure web mail company, which began in 2002 and is currently based in Santa Monica, California. Its unique service enables hospitals, clinics, and doctors' offices the opportunity to have secure web-based video and telephone conferencing by simply switching online services offered by this innovative company.

In addition, he is cofounder of AuthoTecq, based in Long Beach, California, and inventor of the AuthoTecq system, a system invented by Mr. Patawaran in 1999. The AuthoTecq system is an online credit card processing company. Rogel Patawaran sought to remedy one of the problems facing Internet transactions. Because internet merchants act as their own gateway for financial transactions, they have been storing credit card numbers in their own databases, thereby failing to address the necessary security provisions involved in the storage of such sensitive information. AuthoTecq removes this responsibility from the merchant by processing financial transactions on behalf of the merchants. Its system dramatically reduces credit card theft and thereby decreases the amount of credit card fraud. What separates Authotecq from other processing companies is that with the Authotecq system no credit card or personal identity information is seen or stored by anyone. Along with the expertise and knowledge from new products consultant Susan Champion, AuthoTecq has been able to expand, and in February of 2004, the company was certified by Vital Processing Services (Tempe, Arizona), one of the nation's top technology-based commerce-enabling services. AuthoTecq is currently being maintained by the joint efforts of both Mr. Patawaran and Jim Litzinger.

Prior to his involvement in the aforementioned projects, Rogel Patawaran became involved in the development of an onboard computer system used at Rockwell International. His contributions at Rockwell were instrumental in the development of the high-speed transfer of avionic data to flight control.

Continuing his work in the field of onboard air-craft software, Rogel Patawaran worked for Northrop Corporation, a leading manufacturer of United States aircrafts. At Northrop, he assisted in the development of software for the revolutionary B-2 Stealth Bomber. His contributions were instrumental in the development and testing of flight control and delivery systems.

During the late 1980s, Patawaran became involved in the national Bulletin Board System that was a precursor to the development of the World Wide Web. He was a pioneer in co-writing RIPscript, which is used as graphical development software for PC-to-PC communication.

Rogel Patawaran received a BS degree in electrical engineering with an emphasis on computer applications from Cornell University in Ithaca, New York. During this time, he developed alternative energy applications, as well as the then embryonic science of artificial intelligence (AI). After his studies at Cornell, Patawaran sought to understand the blending of applied science with the business of aerospace, thereby continuing his education and obtaining a BS degree in industrial technology with an emphasis on computer hardware manufacturing and distribution from California State University in Long Beach (CSULB).

II. THE NEED FOR AN ELECTRONIC COMMUNICATION SYSTEM

In his landmark book Saving Lives & Saving Money,[1] Newt Gingrich, former Speaker of House of Representatives, describes a new approach to the challenge of creating a better system of personal health and healthcare for the 21st century, a system that saves lives and saves money. His goal was to establish principles of transformation that are successfully trailblazing this process. He points out that there is an enormous gap between the health and healthcare that you and your family should have and the health and healthcare you most likely will have if we do not transform the current system.

Gingrich points out that it is a simple, stark fact that we could have a dramatically better system, and

that such a system would save hundreds of thousands of lives and billions of dollars every year. It is also a fact that mechanisms to achieve this system are already saving lives and saving money.

He indicates that you could be visiting a clinic with electronic medical records, electronic laboratory reports, and electronic drug prescriptions. This entirely electronic clinic saves money and lives because it is far more accurate than a paper system. Such clinics exist at the Kaiser Permanente Hospitals, the Mayo Clinic in Jacksonville, Florida, the Cleveland Clinic, many Harvard hospitals, and all Veterans Administration hospitals in our country.

Today, you could visit a hospital that has dramatically fewer medication errors. These institutions insist their doctors use computerized physician order entry with an expert electronic system that checks for inappropriate prescriptions and ensures the pharmacist receives the correct information in a readable form. You and your family would experience fewer medication errors and unnecessary hospital-induced illnesses, saving you pain, time, and money. Electronic physician order entry is being used at Vanderbilt University Medical Center in Tennessee, Danville Regional Medical Center in Virginia, Latter Day Saints Hospital in Utah, and virtually the entire Veterans Health Administration. [2]

He indicates that healthcare is the only industry in America that can give you a disease and then charge you to cure it. He further reports that out of 100 hospital patients, five or six will be the victim of a preventable error. He states that medication errors alone kill 7000 people each year, adding $2 billion to the overall cost of healthcare.[3] He stresses that these 7000 needless deaths due to medication errors are not only unacceptable but un-American as well.

To date, studies have generally been conducted only in individual facilities and rarely in the outpatient setting; moreover, only a few types of technology have been well tested. However, the large benefits found in the improvement of fundamental aspects of patient care[4-9] indicate that information technology can be an important tool for improving safety in many clinical settings.

Tools that can improve communication, make knowledge more accessible, require key information, and assist with calculations and clinical decision making are available today and should provide substantial benefits. More research is needed on such questions as how best to perform checks, how best to assist in monitoring, and especially, how most effectively to provide decision support in complex situations. In today's systems, many important warnings are ignored,[10] and there are too many unimportant warnings. Approaches have been developed to highlight more serious warnings—for instance, by displaying skull and crossbones—when a clinician tries to order a drug that has previously caused an anaphylactic reaction in the patient. However, many efforts directed at complex targets such as the management of hypertension[11] or congestive heart failure[12] have failed. Overcoming these difficulties will require bringing cognitive engineers and techniques for assessing and accommodating human factors, such as usability testing, into the design of medical processes.

If an electronic system is used in the 21st century in all healthcare centers, it will be a dramatic change in the process of care from a paper-based system to a modern electronic-based system. Because paper and the telephone remain the primary means of communication in our outdated healthcare system, our current system is both inadequate and dysfunctional. A transformed 21st century system of heath and healthcare will have its foundation in secure electronic information sharing that maintains an individual's right to privacy. Paper-based records and hand-written prescriptions would be obsolete in the new 21st century system. Every hospital, long-term care facility, and doctor's office would be required to use an electronic system to order prescription drugs. Medical schools would include electronic software and internet-based systems in their curriculum. The current system's reliance on paper is costing lives, increasing needless suffering, and unnecessarily inflating costs. It is impossible to argue against the immediate implementation of an electronic system for our healthcare facilities that will save lives and save money.

III. PATAWARAN'S CONTRIBUTION TO AN ELECTRONIC HEALTHCARE TECHNOLOGY

Rogel Patawaran's most recent project, iQSecure Solutions, Inc., addresses the current issues surrounding security within data transmission over the Internet. Patawaran has used his past training and experience with encryption to create a system that is able to maintain the complexity and strength of the most superior known encryption processes. iQSecure is a collaboration of efforts. Mr. Patawaran, along with Mr. Greg Chapman, started iQSecure in February of 2003. Today, iQSecure is maintained by the joint efforts of its CEO, John Alexander, along with Director of Technology of the Telemedicine and International Department at Cedar Sinai Health Systems, Ronnie B. Riley.

The core of the encryption process dates back to the most fundamental of warfare tactics. Encrypted messages are created to be understood only by the cryptographers themselves and those for whom they are intended. The very essence of encryption is fundamental to the complexity and secrecy inscribed within each code and is only to be understood by the users themselves. Therefore, all programs that deal with encryption are far too enigmatic and vexing to someone without knowledge of cryptography.

During the 1990s, the pharmaceutical industry sought help from the Food and Drug Administration (FDA) to develop a standard by which a paperless system could be adopted for healthcare. In March of 1997, the FDA issued its final ruling,[13] which established the criteria for which the FDA will recognize the transmission of authenticity within electronic data as well as establishing standards of authenticity for electronic data equivalent to the validity of signatures on paper documents and records. The FDA also recognizes the growth that can be experienced by converting healthcare technology to a paperless system, such as the expediting of patient files in a more organized manner, increasing the speed of file transfer of such documents, reducing prescription errors, enabling computer-generated data analysis and statistics, and reducing storage space.

Patawaran and his colleagues realized that electronic healthcare technology using the highest standard of data encryption in order to transfer data could also dramatically improve the safety of patients in our nation and the world. To answer the needs within healthcare technology, Patawaran created a system using for healthcare providers using the most superior encryption methods. Yet he also realized that simplifying the encryption process equates to devaluing the strength of that very process. By contrast, simplification of the system allows the greatest amount of ease and manageability. This can be seen with standard symmetrical encryption, such as the common user ID and password to authenticate a user. Simplifying the encryption process in order to make it more conducive for use by professional healthcare technicians diminishes the strength of the encryption, and thus renders it useless to the data-sensitive transmission necessary in the healthcare sector. Patawaran created an encryption process that was both durable and able to withstand even the most "brute-force" attack, while maintaining the ease of use that most healthcare professionals require. This product must be robust enough to be able to cater to the demands of security standards set forth by the FDA, and yet simplistic enough in function to be seamlessly integrated into existing healthcare technology.

Consequently, Patawaran created iQSecure Solutions, Inc. Its web mail system uses the Public Key Infrastructure (PKI) format, which is the strongest known encryption format. PKI is used in combination with the Advance Encryption Standard (AES) digital encryption algorithm, which is the current algorithm used by banks and government agencies. Therefore, all of the complexities within the encryption process become a non-issue for the user, in that all encryption/decryption happens instantaneously and thus bypasses the need for the user to have knowledge of the encryption processes or training in algorithm scripts. Now, when hospitals need to transmit sensitive data, all they need to do is log into their iQSecure web mail account using a unique user ID and password and easily transmit such data with

the securest of encryptions standards. No additional training or knowledge is necessary in order to use such a sophisticated system.

The manageability by which Patawaran based the iQSecure web mail solution will enable hospitals to transfer sensitive data at speeds much greater than is possible with the paper-based system that many hospitals still use, as well as maintaining the level of security required by current laws.

In addition, Patawaran enabled the iQSecure process to be platform independent to eliminate problems associated with system compatibility or the downloading of specific programs. This independence allows the user the freedom to use any mobile device to access such data. iQSecure's web mail service eliminates the need to conduct work from a specific location or computer terminal, but rather gives the user the freedom of mobility and saves valuable time that can be critical in emergency situations. Hospitals that use the iQSecure web mail service will be at an advantage in time saved from being able to access such data anywhere and at any time.

Rogel Patawaran's contributions to healthcare technology through iQSecure's web mail may also generate an even greater influx of revenue for hospitals because of the accessibility of such data compounded with the issue of time manageability.

IV. CONCLUSION

Rogel Patawaran's remarkable contributions to the encryption process will aid in the number of lives saved as well as help to avoid medical malpractice by insuring the accuracy of medical records, as well as reducing the number of medication errors or inappropriate prescriptions being filled. These remarkable accomplishments in patient safety are done at a rapid speed that ensures that secure transmission of data-sensitive patient files can be shared between and within hospitals. Finally, with the growing need for an electronic system within the medical field, doctors will be able to securely access all such data from anywhere and at any time, thus reducing the age-old problem of time constraints of a paper-based system.

In recognition of Rogel Patawaran's contributions to the medical field through the use of encryption teamed with the transferring of sensitive data such as hospital records, Rogel Patawaran has been selected as the Outstanding Scientist of 2006.

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