Data Without Boundaries ™

Record Organization, Management and Transfer: Academic Records, Personal Health Records, Official Credentials

Some personal records (such as banking, brokerage accounts, and insurance records) demand and receive a high-level of individual attention. Either in a secure file at home, a safe deposit box, or through an online account, these records are organized, private, and readily available to the individual. However, there are other types of personal records that do not garner the same level of attention, such as Academic Records, Personal Health Records, and Official Credentials (which will be referred to collectively as Vital Records). These other types of Vital Records are often just as important, but are not nearly as organized, secure and available to the individual. Why is there this disparity in how records are used? The simple answer is that it comes down to infrastructure. Banking, brokerage, and insurance companies invested in standards, paper based systems, call centers, back-up systems, and electronic infrastructure to give their customers the ability to have their records available and easily utilized. That same level of commitment is needed to provide an individual-centric storage and transfer of Vital Records.

The Internet has become the standard means for sharing information and transacting commerce in the global economy. Many commercial transactions occur completely on an electronic basis without any paper being transferred (such as software, contracts, news articles, technical designs and specifications, music, video, subpoenas, deeds, stocks, airline tickets, and money). This system of transactions often breaks down when dealing with traditionally paper-based Vital Records. In order to provide easy exchange of Vital Records, several key factors must be met.

1. Individuals need to securely present their Vital Records in paper and/or electronic versions in order to fulfill specific needs or transactions.
2. In paper or electronic form, Vital Records must be easily entered into a database or application.
3. Vital Records must be authenticated, and an audit trail must be available that proves to all interested parties that the records have not been tampered with.

This report intends to explain innovative applications for the storage, utilization, and exchange of Academic Records, Personal Health Records, and Official Credentials that are powered by our *Data Without Boundaries*™ patented technology. The purpose is to spark ideas that can lead to a successful implementation of these applications.

Academic Records

Tripletail's *Data Without Boundaries*™ technology is able to be utilized in a web-based application that collects, stores, protects, customizes, and transfers an individual's validated and secure academic records. A vast amount of time and effort is expended to acquire diplomas, degrees, and certifications, only to leave the records citing those accomplishments languishing, misplaced and unused. Tripletail is in the planning stages of building an individual focused user-centric repository that makes Vital Records

dynamic, readily available, and useful. The Student Record Interchange (SRI) accessed through our web site www.myacademicrecord.com will serve as a secondary archive of academic records. Individuals will compile their own SRI archives by requesting that copies of official validated transcripts be sent to Tripletail's website, secured, and tagged with XML. These barcoded and pin protected official documents will then be posted to www.myacademicrecord.com. SRI validated official records are then ready for use and can be included with other materials and transferred as the individual requires. The user's portfolio will contain a mix of self created demographic and biographical data as well as the official validated records provided by high schools, trade schools, community colleges, universities, professional schools, graduate colleges, and more.

Student records need to be made dynamic and interoperable in order to maintain relevance in the future. *Data Without Boundaries*™ (DWB) technology has the ability to add the customization and interoperability functions needed to fully utilize academic records. This is accomplished by amalgamating and customizing records using data tagging, such as XML, and then embedding these dynamic organizational tags into barcodes for high levels of security and functionality to transfer electronic and/or paper forms. Putting the user in charge of these records will help limit the risk for fraud or alteration. DWB has the ability to lock down and secure each portable database created in the tagged barcode by employing pin protection. When an individual decides to send her records to an academic institution, business, or branch of the military, the recipient of the records will enjoy easy input into their back-end database because of the standard schema, thereby completing the interchange with accuracy, security, and privacy.

Students, alumni, parents, high school guidance counselors and administrators, college admission offices and registrars, scholarship review boards, graduate school and fellowship review boards, military recruiters, and employers will all feel the positive broader impacts of this development effort. Students and alumni will be able to track academic progress and share their accomplishments with friends, colleagues, employers, professional organizations and others. Institutions that provide transcripts, or rely on having validated and secure transcripts, will save the effort and expense of repeatedly handling, re-keying, transferring, and organizing records. Garnering participation in this academic data management enterprise would first focus on the individual user, secondly on institutional users, and eventually on employers. As individuals request records through Tripletail's system, institutions will have first-hand insight into how DWB reduces errors, redundancy, and fraud. The broad positive impact of this technology stems from allowing individuals to harness academic records in numerous new ways for personal use, as well as providing many possible efficiencies to institutions and employers. This technology can make way for a new type of academic record that is easily updated, secure, contains validated data, and has great utility for the individual and institutional recipient.

Health Records
Due to the scattered and disparate nature of Personal Health Records, the burden on the individual to collect and organize pertinent data is far too great for it to regularly happen. Instead of the individual having control over her own records, that duty often falls to

several different care providers who are not equipped to effectively organize and share that vital information when it is most needed. This creates a difficult to answer question for many patients, "Who is keeping track of my health record?"

Public health is in the midst of a fundamental change in how health records are shared and utilized to provide the best possible care to all patients. Through research and development in the realm of portable and secure Personal Health Records (PHR), Tripletail Ventures, Inc. is uniquely poised to accelerate the benefits associated with highly accessible health records. Tripletail's technology offers a novel improvement for healthcare providers using paper documents, digital records, or a combination of both. Our patented data interchange technology allows for an innovative exchange of portable PHR between all sizes and types of healthcare stakeholders using resources that are currently available, resulting in decreased costs and improved patient care. Even in rural or frontier health facilities, with limited IT resources and training, Tripletail's technology can greatly assist the smooth and confidential transfer of patient clinical and/or administrative data files.

Beyond the utility of an individual-centric medical record, there is the added need to create a system that helps save lives. With an estimated 195,000 annual deaths due to preventable in-hospital medical errors, costing approximately $77 billion, healthcare stakeholders are searching for new ways to prevent these errors. Efforts to create a linked system of electronic health records (EHR) to solve these problems are lagging, with only 5% to 13% of healthcare providers using EHR. Tripletail has the ability to enhance Personal Health Records (PHR) that makes them easily transferable between providers. Such records will be made more accurate, secure, efficient, cost-effective, and fully portable. These aims will be reached by applying Tripletail's patented technology utilizing data tagging (e.g., XML, HL7, etc.) in conjunction with barcodes in a novel way to transport information among disparate systems/databases. Moving patient information efficiently from paper to digital and back to paper with barcode-enabled e-forms is a forward thinking solution that is able to work with past and current systems. Tripletail has the ability to create a decentralized process that will allow PHR to be securely exchanged among healthcare stakeholders (patients, general practitioners, hospitals, pharmacies, physical therapists, etc.), with privacy maintained and ease of operation for all users. Benefits of such a standardized process include a decrease in redundant re-entry of data, reduced costs and data entry errors, a decrease in medical errors due to insufficient or out-of-date information, and ultimately improved patient care.

A specific manifestation of Tripletail's Health Records vision is to have a portable personal health record in the form of a small card to fit in a wallet or purse. The individual would be able to enter important health record information into an online form, for instance, print the data in the form of an XML tagged barcode, and slip the information in their pocket. When the time comes to fill out an admittance form, see a new doctor, or receive emergency care, that vital data will be available to be automatically input into the care provider's existing record management system with a quick scan. Tripletail's Video Barcode™ technology enables vital clinical and/or administrative data to be stored as a barcode that is displayed on a cell phone screen.

With either delivery format, individuals will have the ability to take control of their vital health data and care providers will be able to receive accurate information quickly. Administrative data and insurance data will no longer be redundantly entered repeatedly, and baseline clinical data will be accurate regardless of the condition of the patient upon admission or transfer. Identification of patients, their most crucial medical history facts, and key administrative data will all be contained in HIPAA compliant machine readable code using PIN protected tagged barcodes. Having a portable, affordable, and secure electronic data interchange (EDI) system available can reduce errors, save time, reduce costs, and quite possibly save lives.

Official Credentials
Many lessons were learned from the hurricane tragedies along the gulf coast in 2005. In the wake of the storms, volunteers left their homes from all across the country to offer their assistance to people in need. Doctors, nurses, engineers, lawyers, and other skilled people wanted to help, but there was no way to verify that they had the proper credentials to provide the services they claimed. Tripletail sees the need provide a portable and secure means of storing and transferring credential information in this and many other situations. By making available a digital-to-paper-to-digital option for the sharing of such records is a huge advantage over the incongruent methods that exist today.

Blending concepts from both Tripletail's Academic and Health Record visions, it is easy to see how an online repository of Official Credential information could be accessed through the use of a 2D tagged barcode card that the individual carries. As a person achieves new credentials, they could be securely added into Tripletail's online database, and the user could print out a summary of her accomplishments to be carried with her. In addition to hard copy formats, Video Barcode™ technology could be used to display an Official Credential barcode on a cell phone or personal data assistant (PDA). As the user travels to volunteer during a disaster, or moves to a new state, she will be able to quickly and easily prove that she has the appropriate skills and certifications to perform needed tasks. The information can be shared safely and the recipient will have confidence in its validity.

Whether discussing Academic Records, Healthcare Records, or Official Credentials, the foremost advantage of Tripletail's technology and vision is that these records need to be individual-centric, available, easily shared, secure, private, efficient, and accurate. One should have no need to let these vital records languish unavailable, without validation, and unused once they are enabled with *Data Without Boundaries™*.

General Functional Process
Conceptually, a Vital Records system would work as follows. All parties agree on the specifics of a transaction, and create a record of it. Each party receives a copy of the time/date stamped record signed by all parties. The identity of all parties would first be subject to verification by a third-party without knowing the details of the transaction. The party subject to audits then e-notarizes its copy using another third-party which provides its own time/date stamp to allow subsequent audits. Public key encryption would be used to authenticate and verify identity of the parties involved. Encryption

would also secure the details of a record transaction using a one-way hash function, whether the record transaction was in a paper, electronic, or a hybrid of paper and electronic format.

Barcodes

Barcodes are a means of encoding data for input into a computer system. Barcodes encode alpha-numeric, keyboard, or binary information in a machine-readable format. When the barcode is scanned, the data contained in the barcode is decoded, and the device attached to the scanner interprets the scan as standard computer keyboard keystrokes. A simple 1D product barcode contains up to 30 text characters (letters and numbers).

1-dimensional barcode   2-dimensional barcode
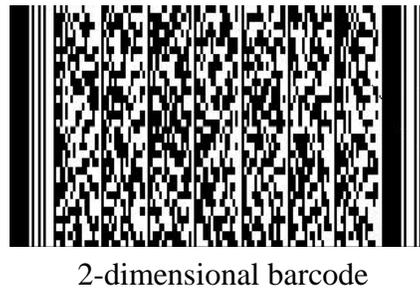
2D barcodes, which are essentially stacked barcodes, can contain significantly more information than conventional one-dimensional barcodes. Conventional barcodes get wider as more data is encoded. 2D barcodes make use of the vertical dimension to pack in more data. Two-dimensional code systems have become more feasible with the increased use of moving beam laser scanners, Charge Coupled Device (CCD) scanners, and Linear Imaging scanners. The 2D barcode stores data along two dimensions and is therefore capable of containing much more information than the 1D barcode (seen on many food products) or the magnetic stripe (seen on credit cards and some drivers' licenses). Depending on the type of 2D barcode protocol used, it can hold from 2,000 up to 7,000 characters, or enough to encode the text of a form. As an example, this particular paragraph contains roughly 1,000 characters. 2D barcodes are used for many applications. Currently 39 states include a 2D barcode on the backside of state issued drivers' licenses. Also, 2D barcodes are a highly accurate means of capturing and entering data because they include built-in error correction that eliminates false positive decodes.

Data Tags

Data tags, enclosed in brackets, are used by software programs to identify the data between them. In this example:

<age>30</age>

the number 30 is the data, and <age> is the tag. Data tags are the key to data transfer because they instruct the receiving data system what the data is, and what to do with the data. For example,

Data Without Boundaries™**: Order Entry and Payment Processing**

```
<firstName>Melinda</firstName>
<middleInitial>B.</middleInitial>
<lastName>Jones</lastName>
<address1>3405 Northfield Ct.</address1>
<address2>Apt. 312B</address2>
<city>Chicago</city>
<state>IL</state>
<zipCode>42050</zipCode>
```

Above is not only the customer's full name and address, but also tags are field names showing the receiving data system where each piece of information needs to be stored.

XML
XML, or eXtensible Markup Language, is a widely used open format EDI system for defining data formats. XML provides a very rich system to define complex documents and data structures such as invoices, molecular data, news feeds, glossaries, inventory descriptions, real estate properties, etc. As long as a programmer has the XML definition for a collection of data (often called a "schema") then they can easily create a program to reliably process any data formatted according to those rules. Self-describing data is the key to XML's rapid and widespread acceptance. The ability to carry metadata (tags) with data is particularly important in integration that involves sharing data within a heterogeneous environment. Here there isn't even a basic common element, such as data types. This "data-typing" information (XML Schemas) allows data to be routed efficiently and processed intelligently. This is a radically different approach to solving the integration problem. Before XML, integration was all about connecting individual systems to each other, in most cases using a proprietary mechanism. Another fundamental reason XML is important (and which builds on the fact that it is self describing) is that by using XML, programmers are able to facilitate a document-centric, loosely coupled model for integration, instead of the more tedious Remote-Program Interface/Application Programming Interface-centric (RPC/API) model. The document-centric loosely coupled model using XML resembles in many ways how enterprises have functioned for years using a paper-based (document) model.

Conclusion
Data Without Boundaries™ is a powerful technology that has the ability to move more types of important and inadequately organized records towards an individual focused user-centric model. DWB is protected under United States Patent Nos. 6,764,009, 7,070,103, and 7,118,040. DWB is considered to be an add-on technology; meaning there is no need to replace existing systems or processes. This technology is hardware and software agnostic, which allows it to interact with many systems easily and in an affordable manner. The use of Video Barcodes™ opens up more options for data interchange of Vital Records beyond paper files. Together, *Data Without Boundaries*™ and Video Barcode™ technology are powerful tools for the future of secure and efficient data management. Tripletail Ventures, Inc. and its accredited integrators are able to design a custom plan to optimize the marriage of DWB with a current system.

For More Information

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