Data Without Boundaries™

XML Transfer of Tagged Barcode Data

In 2004, Tripletail Ventures, Inc., received patent #6,764,009, "Method for tagged bar code data interchange." In 2006, Tripletail received two subsequent patents, #7,070,103 and #7,118,040 "Method and apparatus for bar code data interchange." These patents cover the process for transferring tagged data via XML using barcodes and the display and use of barcodes on video screens.

What is the significance of this patent? How is data transferred via barcodes using XML data tags? And how can this technology change the way business is done? To begin, let's look at the key components of this patented technology:
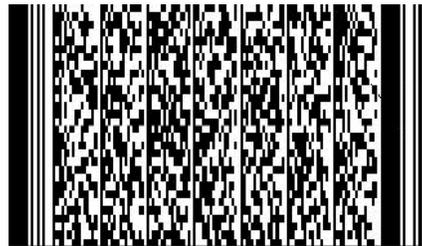
> 1) Barcodes
> 2) XML
> 3) Data Tags

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).
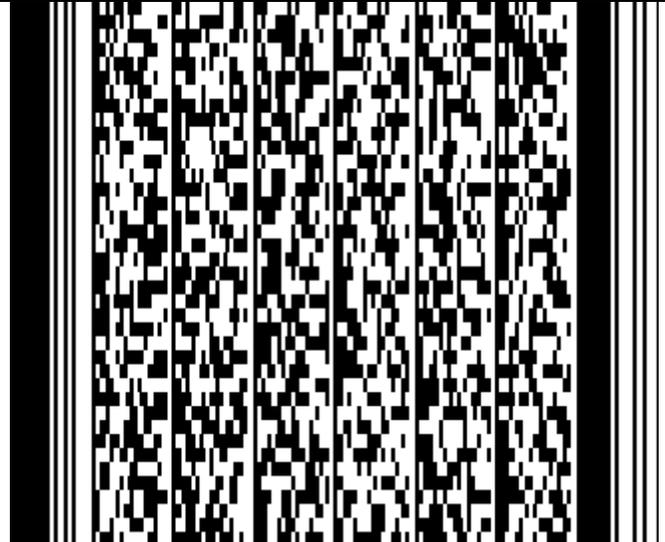

1-dimensional barcode

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.[1] 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.[2] 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.

Whilst it is prudent to minimise the number of data characters encoded in the barcode this example shows what can be achieved with PDF417. The barcode opposite encodes the following rhyme from Lewis Carol's Alice in Wonderland. 249 characters in total, including punctuation and line-end characters...

Tweedledum and Tweedledee
Agreed to have a battle;
For Tweedledum said Tweedledee
Had spoiled his nice new rattle.

Just then flew down a monstrous crow,
As black as a tar-barrel;
Which frightened both the heros so,
They quite forgot their quarrel.

This illustration of the capacity of a 2D barcode is provided in the "2D Barcodes Explained" section of the Barcode Man website, http://www.barcodeman.com/faq/2d.php

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.

Data Without Boundaries™**: XML Transfer of Tagged Barcode Data**

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,

<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.

Forms Processing Using Tagged Barcodes

Forms processing is a major workload for many types of business. Transferring XML data using tagged barcodes can expedite many types of data transfer. Electronic forms can be created which encode the input data automatically into a barcode. When the form is decoded, the data appears to the receiving system as keystrokes, with 100% accuracy.

Invoice Processing

A common business task that is improved by using barcodes with XML data tags is invoice processing. If an invoice is set up as an e-form, and if the receiving system is configured with an electronic style sheet to accept the XML data, then the invoice can be scanned, and the data can be received quickly and easily.
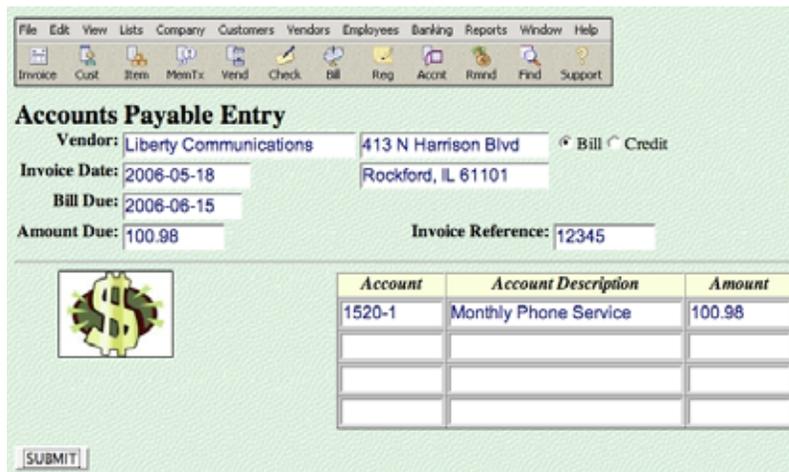
Processing an Invoice with a 2D Barcode and XML Data Tags
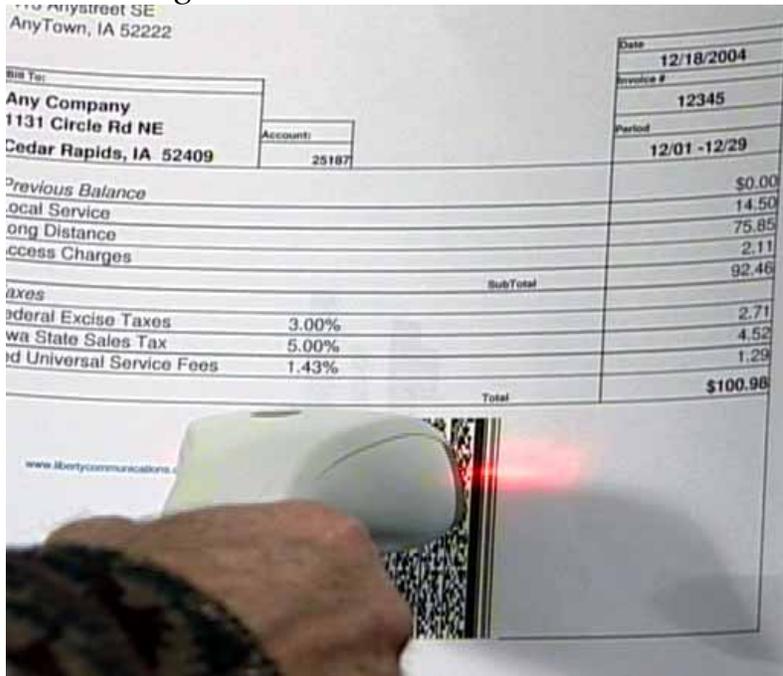
An invoice created using an e-form with a 2D barcode and XML data tags is received by a business. The barcode is scanned.
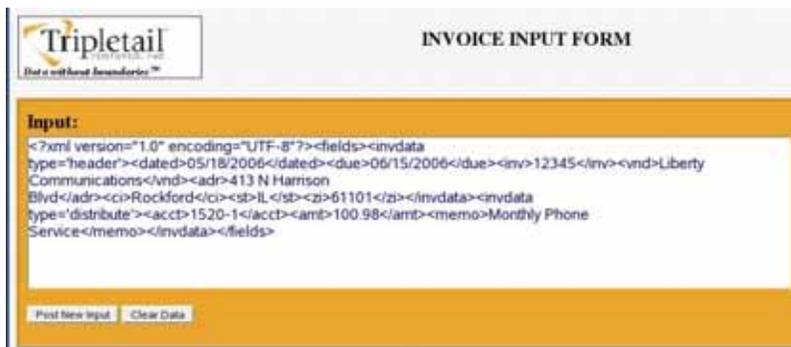
The raw data is decoded from the barcode and is input in the Invoice Input Form.

The user posts the data to the invoicing application, where the information is sorted, by means of XML tags, into the appropriate fields.

Data Without Boundaries™**: XML Transfer of Tagged Barcode Data**

Insurance Application Processing

When a policy applicant fills out an insurance form in longhand, the insurance company has to re-key the data into their system—a time-consuming process with a high degree of inaccuracy.

If the policy applicant fills out a bar-code enabled electronic form, the insurance company simply scans the barcode, and the data enters the receiving system, which has been set up to interpret the tags and parse the data accordingly.

This partial capture of a standard insurance form shows how a barcode can be created on the page to encode the form's data. The insurance company scans the barcode as an accurate and efficient means of inputting the data into their system.

Video Barcodes

When a customer fills out an electronic form with a tagged 2D barcode, the receiving company saves time and money by processing the form electronically. This makes the process of submitting an application quicker, more accurate, and less expensive.

Now, consider taking the process one step further and making it paperless. In this example, an invoice e-form is received as an electronic document. The invoice barcode is scanned directly from a computer display. The data is automatically input to the accounting software of the receiving system.

Scanning and Inputting Data from a Video Barcode

A 2D barcode is scanned directly from a computer's video display.

The data is transferred instantly on the display of a second computer, which may be running a different operating system. At this point, the data is "raw," not yet having been parsed into the receiving computer's accounting application.

The XML tagged data is parsed and input automatically into the recipient's accounting application.

Industry Applications

This patented technology has the potential to transform many industries which rely on forms to transfer data from one location to another. Examples include healthcare, insurance, banking, education, government forms processing, manufacturing, safety

reporting, and all standardized industry reporting. Any type of repetitive forms processing can be expedited by this method.

Industry Reporting
Industry trade associations regularly collect data on industry trends. Association members regularly report their activities. The industry association's data analysts compile the data, analyze it, and publish the results for members, who can study industry trends.

How can the XML transfer of tagged, bar-coded data facilitate this process? The industry association can create an electronic reporting form and post it on a public website. Members complete the form each month, submitting the bar-coded form on paper or electronically. The industry association's data system receives the form, interprets the barcode, and receives the form data automatically.

Standardized E-Forms
Industry associations like ACORD, in the insurance industry, publish standardized types of forms for industry members. This is an excellent example of how adding barcodes with XML data tags could revolutionize an industry. If each of the ACORD forms were set up with XML data tags, and if the form data were encoded in a barcode, then insurance companies around the world could set up their data systems to receive these forms, scan the barcodes, and parse the data.

On an industry-wide basis, such an approach could create incredible economies, virtually eliminating the need for re-keying of data already keyed once into a form, and achieving an accuracy rate of 100%, far higher than that of manual re-entry or Optical Character Recognition.

For More Information
Contact Paul Staman at Tripletail Ventures, Inc., (319-622-5178), or e-mail info@tripletailventures.com.

Data Without Boundaries™**: XML Transfer of Tagged Barcode Data**

NOTES
1 Barcode Man home page, http://www.barcodeman.com/faq/2d.php
2 "About the 2D Barcode and Your Driver's License,"
http://www.turbulence.org/Works/swipe/barcode_faq.html

Data Without Boundaries™**: XML Transfer of Tagged Barcode Data**