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### Greetings!

Spring is in full swing and tax season is behind us, life is good! We all know life is full of surprises, some good and others not so good. When one of those not so good unforeseen scenarios surfaces, are you ready to react quickly? Have you taken steps to minimize the risk of the unknown?

This month, our article covers the increasing importance of supply chain visibility in manufacturing. If a recall or warranty issue arises, being able to isolate the products affected and pinpoint the source of the problem will greatly impact a manufacturer's cost and liability exposure. Having a Lot Trace System in place provides an insurance policy of sorts to minimize your company's risk and hold your suppliers accountable.

Patti Engineering's team of engineers have been developing and refining Lot Trace Systems for over a decade. Beyond what it can do for you in the event of an unforeseen problem, "Lot Traceability" is critical to the improvement of manufacturing productivity, efficiency and quality assurance. In many cases, the return on investment far outweighs the cost of developing and implementing a good Lot Trace System.

The Patti Personnel spotlight is on Dan Teferi, an exceptional engineer with a very interesting background. Dan speaks five languages and has lived in three countries. Dan has worked extensively on Lot Trace Systems and contributed greatly to our feature article this month.

We always love your feedback. Let us know if there is a specific automation topic you are interested in or if you have comments on what we have covered here.

Thank you for your interest in Patti Engineering!

Best regards,

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## The Importance of Lot Trace Systems in Today's Manufacturing

'Lot trace' in the auto industry became a hot topic back in 2000 when government regulation in the form of the Transportation Recall Enhancement, Accountability and Documentation (TREAD) Act passed into law. The law demands part-level visibility in the supply chain and was brought about as a response to the Ford-Firestone sport utility tire controversy.



In the case of the Ford-Firestone incidents, failures all involved tread separation - the tread peeling off followed often by tire disintegration. If that happened when the vehicle was running above a certain speed, there was a high likelihood of the vehicle leaving the road and rolling over. Many rollovers caused serious injury and even death; it was estimated that over 250 deaths and more than 3,000 serious injuries resulted

from these failures.

While the initial cost to auto manufactures to implement part traceability was a daunting financial and time-consuming task, one could argue the gains in supply chain efficiencies and the ability to isolate a problem and quickly respond to warranty claims and recalls have had a substantial long term savings impact. Outside of the realm of the auto industry, other manufactures could benefit from implementing lot trace applications. Return on investment includes product quality assurance and supply chain visibility and accountability.

In fact, there is a new food safety law known as the FDA Food Safety Modernization Act (FSMA), the most sweeping reform of food safety regulation in many decades, which will be impacting food manufacturers in the same way the auto manufacturers were impacted back in 2000. History repeated itself here. Similar to the Ford-Firestone incidents, the 2009 recall of peanut products from Peanut Corporation of America was the catalyst for the new food industry regulations. Besides the human cost with nine deaths and hundreds that became sick after eating the contaminated peanut products, there are reports the financial losses have topped \$1 billion.

A lot traceability system enables a manufacturer to automate the tracking of the composition of their product through the entire production process. From the purchased lots from suppliers to finished product shipped to the customer. Essentially, a lot trace system (LTS) creates an accurate genealogy of the products composition.

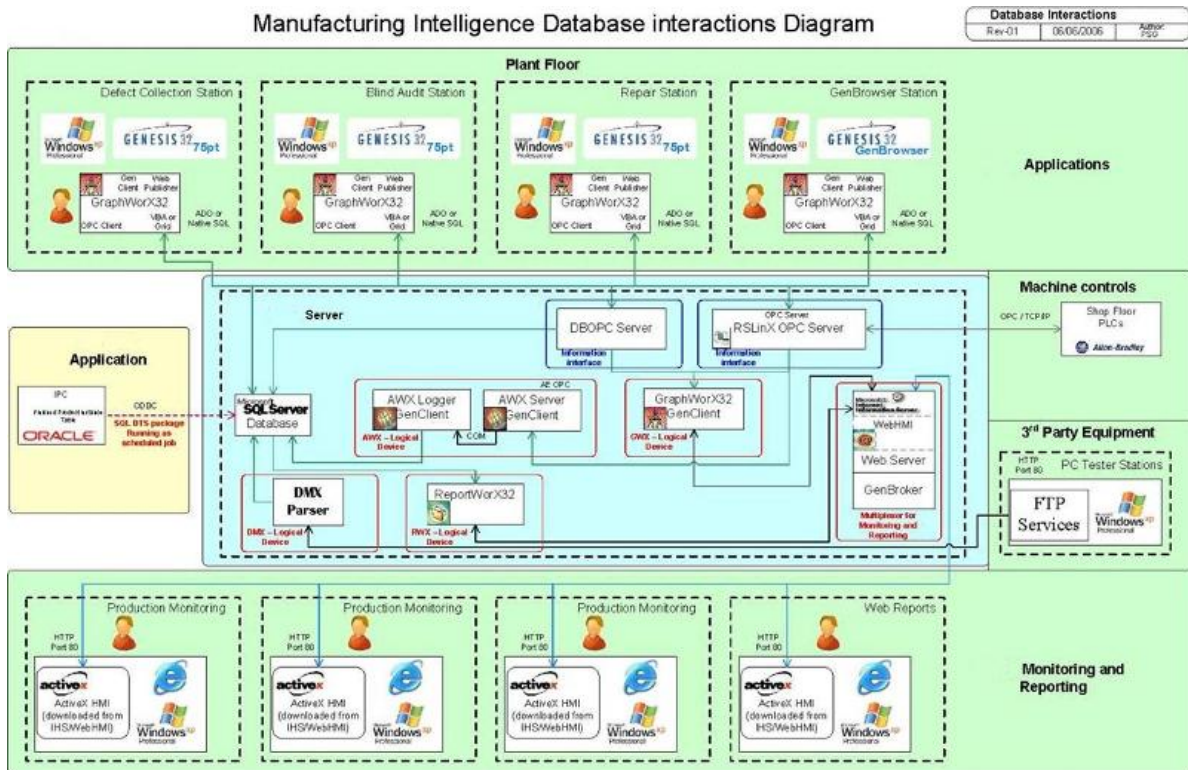
Patti Engineering has been designing and refining Lot Trace Systems from the initial implementation of the TREAD Act back in 2000. To meet the new government regulations, we have designed and implemented LTS applications in plants in the US, Canada, Mexico and China for various clients in the automotive industry.

Patti Engineering collaborates with clients on system architecture and data structure requirements for their manufacturing execution system (MES) applications operating in the space between the front office information technology (IT) and plant floor operations. The LTS application is just one part of the overall manufacturing execution system which we customize to provide our clients with the manufacturing and production intelligence needed to translate manufacturing data into actionable intelligence for decision makers.

ICONICS is one of our technology partners which we have extensive experience with the development of customized, user-friendly LTS applications as part of an overall MES solution. Our solutions have been implemented in manufacturing facilities building engines, transmissions and car interior parts. From an engineer's perspective, the following overview gives more detail related to the ICONICS based LTS application developed by Patti Engineering.

### Patti Engineering Lot Trace System Overview

The LTS applications was developed using VB.NET and it runs in work stations located along the production line tracing critical build data such as serial numbers of each part creating an accurate genealogy of the final products composition. ICONICS Genesis 32 and the BizViz products including graphworks, alarmworks, dataworks and reportworks were used to create the robust tracking system. The LTS is designed to interface with different hardware and software systems such as: PLC's, scanners, databases, and label-printers.



The LTS cycle consist of the following:

- It monitors a PLC bit to find out if the product has arrived at the work station
- When the item arrives in position, LTS reads the PLC register to retrieve the serial number and build code assigned to the finished product - alternatively it also monitors a scanner port to get a scan
- Once the serial number is obtained, the LTS prompts the operator to scan the part number of the components being assembled - multiple components can be scanned within the same station
- It then proceeds to verify the validity of obtained scan against the stored configuration containing the requirement, such as the part number correct format, expected length of characters, duplication errors (i.e. part number not previously used)
- If all conditions are satisfied, the LTS stores the data into a database system located on a server to complete the cycle the LTS, sends a "Release as Pass" signal to the PLC controlling the line
- Upon any error, operators are prompted to take corrective action

Some of the characteristics of the LTS system are:

- Versatility
  - LTS can communicate with different kind of PLCs - SLC, PLC5, Contrologix, Micrologix
  - LTS can obtain scans from different kind of scanners ( Symbol, Intermec, 2d barcodes, fixed and manual scanners)
  - It provides an interface to modify scanned data to fit specific data modification (parse out the scanned data to remove or add more characters)
  - It can communicate with different database systems: Microsoft SQL Server, Oracle and Progress
  - LTS can interface with Intermec printers to generate labels that can be used for verification purpose down the line
- User Friendly
  - It provides step by step easy to follow instructions to the operators
  - Highly graphic and provides intuitive configuration tools
  - It provides clear error messages and offers possibility for recovering from an error by either repeating the scan or resetting the cycle
  - It provides easily accessible, daily generated log files containing relevant steps performed during the cycle
- Secure and Dependable

- The system can run in "Buffer Mode" following network issues and is able to upload buffered data into the server upon restoration of the network
- LTS can be run in manual mode if communication to PLC fails
- It has manual data entry system in case scanners malfunction
- It runs automatic backup to the server saving configuration data, initialization parameters as a contingency plan following a machine failure and the system can easily be restored by replacing the machine

In conclusion, "Lot Traceability" is critical to the improvement of manufacturing productivity, efficiency and quality assurance. The Lot Trace System application was initially developed by Patti Engineering in 2000 and has been continually improved over the last decade. In addition to application development and implementation, Patti Engineering provides clients with 24/7/365 support service.

For more information on Lot Trace Systems and how they may benefit your manufacturing facility, contact Patti Engineering for a free initial consultation.

*Phone: 1-800-852-0994 (US Only)  
(248) 364-3200*



## Patti Personnel - Dan Teferi



Dan Teferi

This month our spotlight is on Senior Engineer, Dan Teferi. Dan joined Patti Engineering in 2001 and has been involved in many challenging projects developing controls and shop-floor applications for clients including Comau Pico, Android Industries, JL Automotive and JCI.

For the last seven years, Dan has been part of Patti Engineering team working for the MIRA project (Manufacturing, Intelligence, Reporting Application) commissioned by Johnson Controls Inc, a leading supplier of automotive interior systems and electronics.

MIRA provides standardized shop-floor processes designed to improve manufacturing productivity and efficiency and enhance quality assurance. Dan has been instrumental in developing front-end and server applications, launching new plants and continually upgrading our software packages to meet customer requirements and expectations.

President of Patti Engineering, Sam Hoff commented the value Dan brings to our engineering

team, "Dan is an excellent engineer and a great communicator. We can always count on Dan to do whatever is necessary get the job done to the highest of standards."

To compliment his engineering talent, Dan has a very interesting life story. He is fluent in five languages and has lived in three countries. Originally from Eritrea, a nation of four million people in East Africa, Dan moved to Rome, Italy in his youth where he completed part of his elementary and high school years. He graduated as an Electrical Engineer in 1998, from Ryerson University in Toronto

Canada and currently lives in Windsor Ontario Canada.

Dan has been married to his wife Saron since 2001. Saron has also lived in three countries, like Dan she is also originally from Eritrea but lived in Australia for fifteen years before moving to Canada. Dan and Saron have 2 children; daughter Mickal (8) and son Adam (6). Dan refers to Mickal as his 'Princess' and his son Adam as his 'super energetic boy'. As you can see Adam in his picture below is engaged in his Star Wars battles! Dan enjoys spending as much time as possible interacting with his kids and he is looking forward for the warmer weather to spend lovely evenings playing outside in the park.



Dan is passionate about learning new languages and different cultures. Dan speaks the native language of Eritrea called Tigrigna and having lived in Italy, he is fluent in Italian. In addition, he speaks Amharic (the language spoken in Ethiopia), English, and his French (ce n'est pas mal) is not bad! According to Dan he is brushing up on his French language skills, "both of my kids attend a fully French school in Windsor Canada and it fascinates me to hear them switch effortlessly between French and English."



Dan with his wife Saron, daughter Mickal and son Adam.

Inspired by his daughter's piano playing skill, most recently Dan has picked up another interest, he started practicing guitar. Dan and his daughter have formed their very own band and have been practicing playing Christmas and birthday songs for small circle of friends and family.

To round out his many interest, Dan follows the NBA and European Soccer Tournaments played in Europe.



#### **Dan shared his perspective on being part of the Patti Engineering team:**

*"I am pleased to be part of Patti Engineering for more than 10 years. Indeed, time has flown very fast to me, continuously immersed in exciting and challenging projects, it feels like yesterday. Patti Engineering strives to promote and deliver innovation and state-of-the-art engineering solutions by investing in new technologies and providing an environment of trust and leadership to its employees. All these years I have been surrounded by amazingly talented, great colleagues whom promote dedicatedly a spirit of cooperation and sharing knowledge. In the coming years, I look forward to continued success and sustained growth by the company."*

