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# One Version of the Truth: Developing a Digital Transformation Strategy



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Matt has over 26 years of experience in the manufacturing industry with a primary focus on information technology and business intelligence.

He has a record of successful leadership in information technology, quality, operations, mechanical engineering, and commercial areas of manufacturing organizations in automotive, heavy diesel, marine, and material handling systems verticals, along with experience in the healthcare and government sectors. As a result, he has a sound cross-functional knowledge base and skill set that enable him to quickly and

effectively evaluate organizational challenges and make recommendations of best practices to improve operational efficiency.

He has 23 years of experience in ERP implementation covering multiple platforms, but primarily focuses on the Plex platform, with a successful

track record in global and multi-facility organizations, as well as single facility implementations and projects.

His primary areas of focus have been across Europe and North America, with Japanese owned, public and private equity, VC, and privately held clients.

Matt has extensive experience in various manufacturing processes and types of equipment, as well as ERP integration, PLC programming, and SCADA/OPC development and mechanical design. Matt specializes in Plex's Production Control, Order Fulfillment, EDI, Materials Management,

Engineering, Quality, Maintenance, Production Requirements Planning (PRP), and Materials Requirement Planning (MRP) modules.

Prior to Plante Moran, Matt served as the Quality Manager for an automotive and heavy diesel thermal controls manufacturer.

Matt is a member of the Society of Manufacturing Engineers and the Project Management Institute.

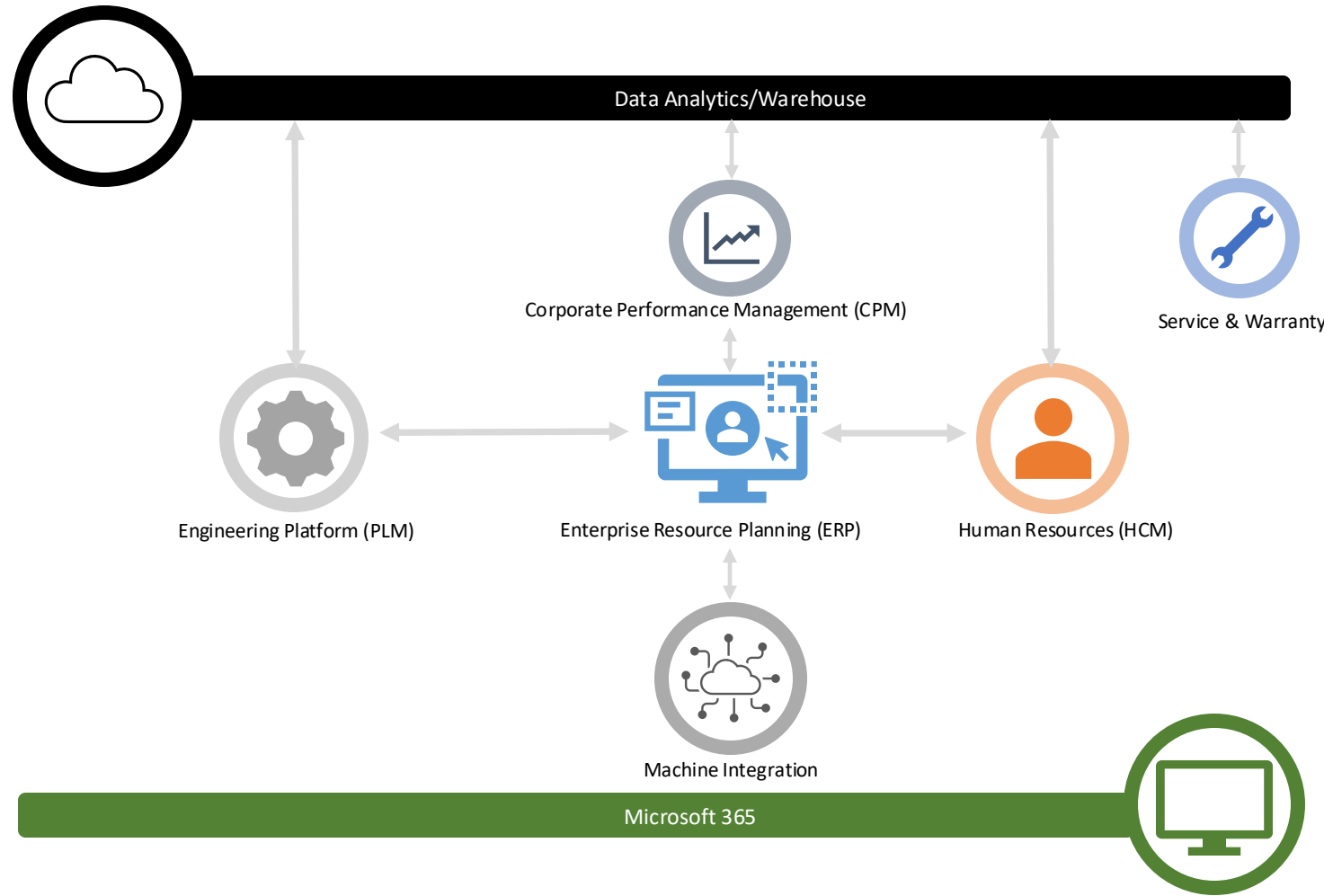
Matt studied electrical engineering and computer science at North Carolina State University.







# Leveraging digital technologies



# Staffing Challenges

- ERP and IOT Projects require a diverse set of skills spanning multiple disciplines within IT as well as in depth knowledge of manufacturing processes, ERP Requirements, and business goals
  - Networking and Security
  - Industrial Controls and PLC
  - Robotics and Material Handling
  - OPC and SCADA
  - SQL and Database Architecture
  - Application Development and Project Management



# Common Issues

## 12 SIGNS YOUR BUSINESS NEEDS TO REPLACE ITS ERP SYSTEM

To respond to market pressures, organizations have to constantly enhance the way they use ERP systems to continue to add value to the business. This could mean significant upgrades, enhancements, acquiring new solutions, or retiring old ones. A limited ERP system can affect ROI, optimal performance, and the overall business strategy of the company. Here are several key signs that indicate it may be time to assess your current situation.

- 1 Inventory and costing inaccuracy**  
Frequent wasteful physical inventory counts and unexplainable adjustments; unclear margin and profitability
- 2 Mergers and acquisitions**  
Unable to integrate new plants or entities
- 3 Business growth and diversification**  
Capabilities of current software will not support additional requirements arising from new types of customers or products
- 4 International expansion**  
Currency, language and new regulatory reporting requirements
- 5 Lack of timely information**  
Data from current system(s) is disintegrated and is days-old or batched
- 6 Material traceability**  
Cannot effectively trace raw materials, WIP or finished goods
- 7 EDI**  
Difficulty meeting new or changing customer requirements
- 8 High reliance on Excel**  
Lack of integration, collaboration and efficiency
- 9 Experienced talent loss**  
ERP champion or power users have left the organization
- 10 ERP vendor viability**  
Current system is no longer supported or functions are limited
- 11 Software modifications**  
Making upgrades is expensive or impossible due to modifications
- 12 Neglected ERP maintenance or obsolescence**  
High costs to upgrade



# Key issues

## Client Pain Points

- Inventory inaccuracy
- Tribal knowledge
- Disintegrated systems, “lacking one version of the truth”
- Manual processes (batch processing), paper transactions, poor reporting
- No real-time data
- Long month-end close process
- “We don’t know what our costs are”

## Improvement opportunities

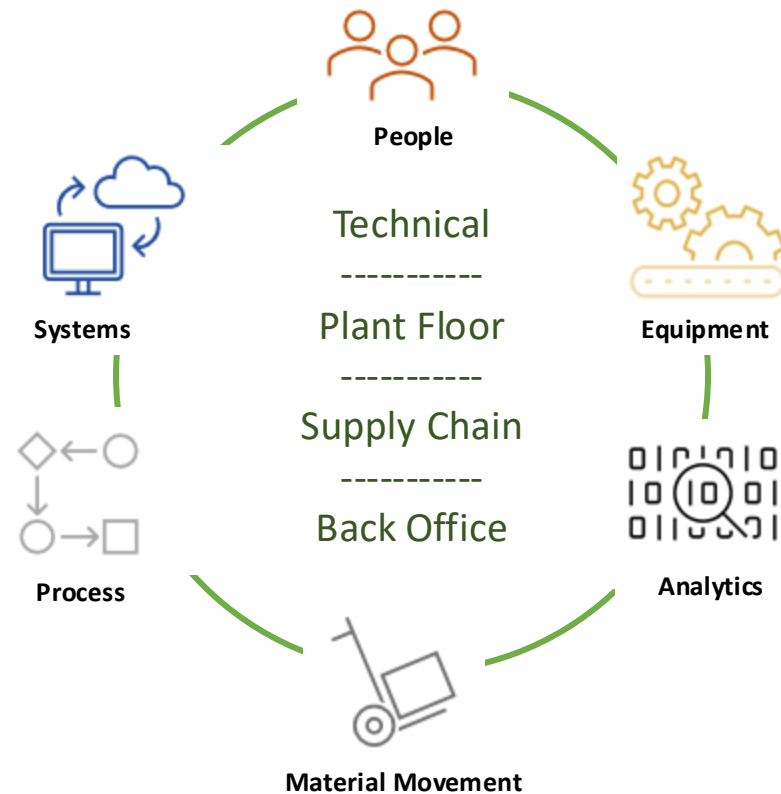
- Integrated systems
- Transactional traceability/real-time data
- Software as a Service (SaaS), improved cybersecurity
- Strategic roadmap
- Common model for M&A activities
- Automated processes, more efficient workforce
- Improved planning, reduced inventory



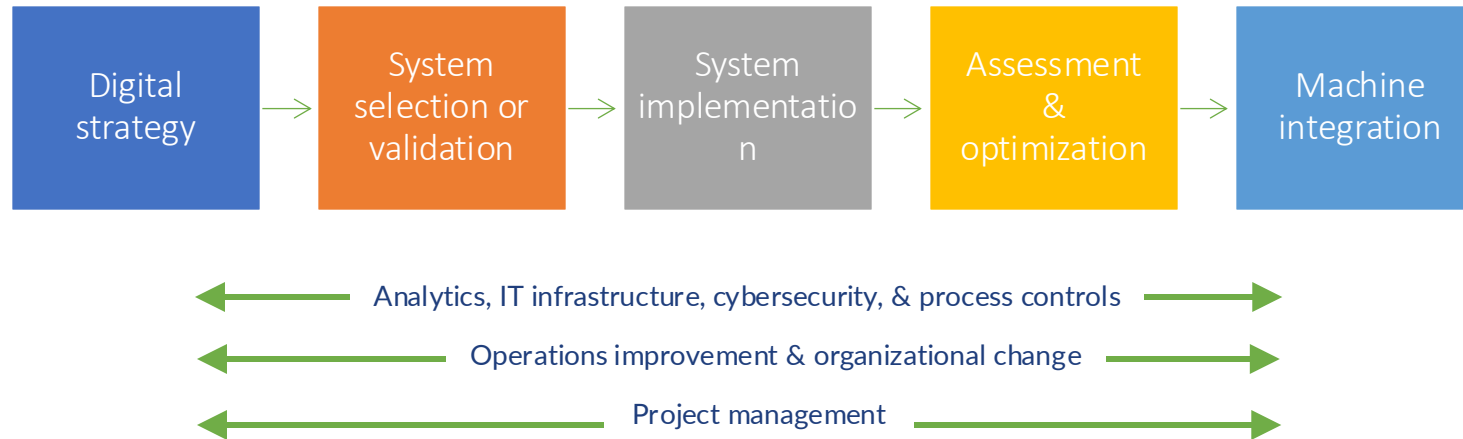


# Digital Transformation Services

- Our team works with manufacturing and distribution clients to optimize their use of digital tools. We focus on the relationships between people, processes, and technology to drive improvements across the organization.



# Lifecycle of services



# Success Factors

SUCCESS FACTOR	DESCRIPTION
<b>Business case</b>	Clearly defined and understood; demonstrates need for change.
<b>Planning</b>	For the initial assessment and beyond, get experienced help; demonstrate success early.
<b>Executive sponsorship</b>	Must be active upfront and throughout; supports business case.
<b>Staffing</b>	Appropriate participation from the right user and IT resources.
<b>Preparing the organization</b>	Training for users and the IT function on how to run the project, the features of the software, and the ultimate solution.
<b>Communication</b>	Establish methods for frequent communication with all stakeholders.
<b>Managing scope</b>	Establish upfront and stick to it; define process for documenting and evaluating change.



# Success Factors

SUCCESS FACTOR	DESCRIPTION
<b>Managing risk</b>	Know what to look for, how to avoid the pitfalls, and how to deal with them if they occur.
<b>Managing knowledge</b>	Standardization of approaches across teams, facilitating reusability of work products, and sharing of lessons learned.
<b>Data quality</b>	Start on it as soon as possible; determine what to clean up and convert and what to create.
<b>Modifications</b>	Avoid and perform only to support unique requirements.
<b>Testing approach</b>	Apply structured approach to validate readiness for go-live.
<b>Business/solution alignment</b>	Keep it simple — focus on the business change, not the technology; an appropriate solution implemented on time and on budget is better than a perfect solution that is late and costly.
<b>Measuring success</b>	Establish measures and targets to gauge success.



# Current Common State

- Very few organizations use a monolithic application to manage Production, Accounting, Engineering, HR, Maintenance, Quality, Tooling, and Inventory
- Even when you purchase an “All In One” application, it usually turns out to be at least five or six applications that have been integrated
- When you allow your different functional areas to source and implement their own applications without centralized leadership and oversight, you can wind up with dozens or even hundreds of applications



# VOLTRON™



# VOLTRON™

- A combination of machines and systems that was intricately crafted and engineered to work together in such a way that the combination is greater than the sum of its parts
- Requires intelligent design, and an architect or architects behind the system structure



# Modes of Enterprise Application Growth and Integration

## Organic

- Functional area champions source and implement the software that works for them
- Heavy focus on budget and timeline often leads to lack of attention to inter-departmental functions
- Champions may not be capable of evaluating impact to global business goals and objectives





# Modes of Enterprise Application Growth and Integration

## Reactionary

- Systems choices may be thrust upon you through an acquisition, software end of life, regulatory requirement, or customer requirement.
- Systems must be implemented quickly to be in compliance or maintain support, and this rarely leaves time for effective cross functional business process and role and responsibility analysis



# Modes of Enterprise Application Growth and Integration

## Architected

- Establish a clear picture of current state and future state before starting work
- Empower key parties to make decisions necessary to reach the end goal
- Establish needs, wants, and “don’t wants” before the sales cycle starts



# Principle Concepts for Application Architecture

- **Store data once**
  - Reference it via views or integration
  - Processes involving keying the same information into two systems are a missed opportunity
  - This automatically creates a data conflict and is always non-value add
- **Map business processes first, then shop for software**
  - Map roles and responsibilities, inputs and outputs, along with critical factors
  - Doing this during the sales cycle results in rushed decisions



# Principle Concepts for Application Architecture

- Map existing software ecosystem before evaluating new applications
  - Establish which application will be used by which group
  - Find and eliminate any areas where stored data will overlap
- Ensure that you have proper resource to support effective analysis and decision making
  - Engage third parties for additional support and guidance if necessary



# Questions to Ask

- How will this new application fit within the architecture of my existing application suite?
- Will this system duplicate data that already resides within another database or application?
- Will implementation of this system have implications to the roles and responsibilities of my employees?
- Will my old standard procedures need to be revised to avoid non-value add activity?



# Sistine Chapel



# Sistine Chapel

- Michelangelo didn't paint this ceiling while also keeping a dozen servers, firewalls, routers, wi-fi controllers, and hundreds of desktops, printers, scanners, and mobile devices working.
- Why would your IT manager be able to?



# Questions

Raise your hand if you  
regularly see two different  
reports with contradictory data





# Client Example

- \$2B annual revenue stamping, welding and assembly
- 17 facilities across North America, Europe and Asia
- Japanese owned with corporate mandate for financial reporting
- Corporate mandate for SAP as an accounting package
- Plex selected as shop floor ERP/MES system
- Minimal integration during the implementation process due to budget
- Receiving, Production, and Shipping all have to take place in both systems
- Hundreds of man hours per week in non-value add activity
- Due to data entry process issues, systems are never aligned, generally off by 5%-10% overall day to day



# Client Example

- Stamping facility with 50 presses running 3 shifts 7 days
- Purchased MES system through Machine Integrator
- Migrated to new ERP with full overlap in MES functionality
- Decided to use both systems, one for shop floor visuals and one for production recording, inventory and efficiency monitoring
- Hard coded rates in MES are not updated with changes in ERP
- Same work center has two different efficiency rates
- One shows work center is making money, other shows losing



# Client Example

- Implemented new HRIS/Time and Attendance System
  - Used to track employee hours, training, and absences
- Legacy ERP includes work center labor tracking
  - Employees log in to work centers to correlate labor with production
- HRIS is the data source for payroll
- ERP is the data source for production efficiency and labor capacity
- HRIS and ERP direct labor hours are off by 11%



# Client Example

- Which system is accurate?
  - Are you sure?
- Are employees “buddy punching” causing you to pay extra hours?
- Are the employees wandering away from their work centers for long breaks?
- What do you do when you should have sufficient production capacity based on HRIS hours but ERP shows over 100% efficiency and you are not meeting your production goals?



# Questions

Raise your hand if your shop  
floor schedule is in Excel



# Client Example

- Demand received via EDI and automatically loaded to ERP
- ERP Scheduling module used to automatically generate production jobs based on EDI demand
- List of production jobs exported to Excel and loaded to MASTER SCHEDULE Excel file
  - 415 MB Excel file
  - Takes six minutes to open
  - Regularly gets corrupted when Excel crashes during edits
  - Has to be restored from backup by IT 10-15 times per week



# Client Example

- Three full time employees spend six hours per day manipulating MASTER SCHEDULE Excel file
- Once it is completed today for tomorrow's production, the schedule is printed on a plotter, four feet high and twelve feet long, and this is posted on the wall in the "war room".
- Supervisors then have to come into the war room and copy down their production schedule for the day.
  - Supervisors are not allowed to open the Excel file because they might corrupt it if it doesn't open correctly



# Client Example

- ERP has automated scheduling tools that everyone admits could replace the effort of the three FTEs running automatically over night
- Can't use because WE DON'T TRUST OUR INVENTORY.
- Full inventory 1X per month to try to improve inventory accuracy
- Root cause? Company decided not to invest in mobile devices for material handlers. Forklift drivers write down all of their inventory moves on a clipboard, and then transact in the system at the end of the day.





## Questions

Raise your hand if you would  
bet \$50 that any given  
container in your inventory is  
really where your ERP shows  
it to be



# Trust your inventory

- That's a low estimate of the cost every time someone has to go searching for a container that's not where it's supposed to be
- If you wouldn't bet \$50 of your own money, why is it OK for your company to lose that much dozens of times a day?



# Batch Labeling

- Operators print all labels needed for a job or for a shift at the beginning
- A great way to create hours of headaches trying to save seconds of time
- Results:
  - Inaccurate Inventory
    - Thought we would complete 500, but only finished 450.
    - This leaves an additional “live” label lying around that has to be “Production Corrected”
    - Source material is depleted even though it’s physically still present, this also has to be adjusted back in
  - False productivity data
    - Operators appear to be extremely efficient for a short period of time, and then much less so
    - Creates misleading capacity data
    - Incorrect actual cost
  - Mislabeled material
    - That label that was created earlier that didn’t get applied to a container is going to wind up on another container later, either in addition to another label, or showing the incorrect traceability / Mfg date



# Plex Clients: Operational improvements delivered



## Quality improvements

- Accurate real-time inventory control
- Lot traceability with serialization
- Improved scheduling capabilities
- Line-side labeling
- Supplier scorecards
- Improved traceability



## Cost reduction

- Reduce obsolescence
- Reduce scrap and rework
- Reduce premium shipping costs
- Reduce excessive WIP
- Real-time reporting of labor efficiency
- Real-time production reporting via machine integration



## Overall improvements

- Visibility throughout the supply chain
- Improved security and process controls
- Fully integrated EDI with customers and suppliers
- Plant floor/process improvements
- Executive KPI dashboards



# DTS client successes

## Client

- \$1.5b manufacturer of structural car components with stamping, welding, and press quench capabilities. 7 plants located throughout the U.S., Canada, and Mexico.

## Services

- Plex Implementation -> USMCA Regulatory Requirement Support -> RPA development

## Operational Improvements

- Real-time production/scrap/downtime reporting via machine integration
- Reduction in raw material inventory by \$1.6M
- Real-time inventory traceability from OEM to raw material mill lot/heat certification
- Supported migration to financial shared service model

