EMS Industry Complexities: The Need for a Comprehensive ERP System With Extensive Tools

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Overview

• Firstronic: An Evolving Company
• An Overview of Typical Electronics Manufacturing Services (EMS) Challenges
• Key Plex Benefits for a High Complexity Operational Model
• Plex and Lean Manufacturing
• The Results: Two Years After Implementation
• Lessons Learned in Implementation
• Looking Ahead
Firstronic Global Footprint

- International Purchasing Office (IPO) in Hong Kong through Maxway JV
- JV with FSEG in Pennsylvania
- JV with Dorner Works
  Grand Rapids and Novi Michigan
- Czech Republic (JV)
- Juarez, Mexico (launching new plant)
- Shanghai, China (JV)
- Goa, India (JV)
Firstronic

An Evolving Company

Two Years Ago

- Grand Rapids factory
- 45 employees
- An average of 1.5 product launches (with PPAP) per month
- BOM line items managed: Thousands
- Systems strategy: Low-end MRP system combined with home-grown modifications
  - MIS highly spreadsheet driven

Today

- Grand Rapids factory, strategic alliances in the Czech Republic and China to support regional manufacturing requirements. Mexico factory planned to open later this year.
- 190 employees
- BOM line items managed: Hundreds
- An average of 3 product launches (with PPAP) per month
- Systems strategy: 24/7 paperless visibility with Plex
The Mid-Tier EMS Challenge

An Atmosphere of Controlled Chaos

Typical OEM Production Environment

- Product lines developed around a specific capabilities model
- High levels of component commonality
- Predictable forecasts (may even be level loading demand by outsourcing variable demand)
- One set of quality standards
- Good long-term visibility into new products and capabilities requirement changes

Typical EMS Production Environment

- 20-30 customers with unique approved vendor lists (AVLs)
- Mission critical product from a range of industries requiring compliance with multiple standards such as ISO 9001, ISO/TS16949, ISO 13485 and AS9100
- High mix, variable demand batch production
- Capabilities requirements driven by customer requirements
Firstronic Electronic Manufacturing Services
Complexity Grows Before Revenue

- EMS is a low margin industry where overhead cost must be minimized through efficient practices
- Mission critical products such as automotive and medical can have long ramp-up periods
  - Volume production can come a year after a series of product qualification runs
- Project launches are more difficult to manage than volume production because of the number of variables that must be watched
- Systems strategy needs to ‘force multiply’ program management and supply chain management resources
Plex Operational Benefits

Working Smarter, Not Harder

**Operational Support**
- Comprehensive enough to support migration to a paperless environment
- Flexible
- Accessible remotely
- “Best practice” user group network

**Customer Requirements**
- Supports traceability and quality data collection requirements for medical & automotive customers
- Accessible remotely
- EDI/Portal Support

**Scalable**
- Allows modules to be added as business grows
- Ability to support multiple sites
Implementation of Lean Manufacturing

- Holistic approach to Lean manufacturing
  - Synchronous Flow Manufacturing
  - Supply Chain Management focus
    - Optimized lot sizes
    - Defined buffers maintained by suppliers
    - Re-stocking triggered by pull signals
    - Vendor Managed Inventory (VMI) limited to maximize production floor space
Firstronic’s Operational Improvement Strategy

Implementation of Lean Manufacturing (continued)

- Synchronous Flow Manufacturing
- Managing Constraints
- Small Transfer Batch Sizes
- Quick Changeovers/Setups
- Standardized Process/Equipment approach to minimize variation
- Workforce cross-trained to enable deployment among the operations having greatest demand
- Continuous Improvement/Elimination of Defects
- Production status highly visible to enable quick identification of bottlenecks
Plex Benefits for Lean Manufacturing

Supply Chain Management

• Integrated ability to monitor our response to customer demand
  • Forecast
  • Customer Portals/EDI
  • Component Inventory
  • Job Scheduling
  • WIP – Production/Inventory Tracking
  • Scheduling Shipping
  • Real-Time
Plex Benefits for Lean Manufacturing

Online Documentation Management

- Operator access directly from Workstation Control Panel
  - Work Instructions
  - Quality Manual
Plex Benefits for Lean Manufacturing

Quality Enhancement through Document Management

- Ties Work Instructions, Control Plan & FEMA
- No More Redlines
- Real Time Updates

Current

Note Polarity
Plex Benefits for Lean Manufacturing

Document Integrity & Continuous Improvement

- Data control through document control system
- Online approval process
- Ability to set review frequency, review actions and retention periods
- Ability to track and store revisions plus create distributions logs
Plex Benefits for Lean Manufacturing

Production

• Enhanced Quality support
  • Verification of start-up activities monitored through Plex check sheets
  • Part-to-part scanning of reels at SMT verifies part numbers against documentation ensuring correct feeders with correct parts are loaded
  • Inspection history with SPC capabilities now available within the system
  • Inventory traceability through each step in the manufacturing process through container serial numbers
Plex Benefits for Lean Manufacturing

Production – SPC Checksheets
Plex Benefits for Lean Manufacturing

Production – Quality Statistics
Plex Benefits for Lean Manufacturing

Production

• Enhanced HR support
  • Integration of time and attendance tracking with automatic points system
  • Training is streamlined and tracked with the System
• Optimized support for customer requirements
  • Inventory traceability through each step in the manufacturing process through container serial numbers
  • Customer portal allows customers to monitor production status including orders and inventory
Plex Benefits for Lean Manufacturing

Production

• Cloud Based Model
  – Minimal IT Staff Requirements
  – Plant Floor Infrastructure Support Focus
  – Focuses our Technical Resources on Core Competencies

• Real-Time System
  • 24 X 7, 4 Shift Model
  • Remote Access

• Continuous Improvement Process
  • Monthly Metrics Support
  • Quicker Fiscal Closing with SCAR process
  • Supplier Scorecard
The Results After Two Years

Plex’s Features Enhance Our Competitive Advantage

- Plex implemented in only 4 months
- Inventory turns have increased from 4-5 annually to 10-12 annually
- 2 buyers manage 400+ parts
- Operational improvement driven by dashboard which measures:
  - Revenue
  - Inventory Levels/Turns: by customer and by program
  - Warranty Returns
  - Labor to Plan
  - Purchase Price Variance
  - On Time Delivery: by customer and by program
  - Backlog
Lessons Learned in Implementation

If we had to do it all over again..

- Understanding how many Plex stations are needed
- More relaxed schedule
- More Training for Plant Floor & Front Office Personnel
- Plex Documentation
- Plex Community
- Plex Functional Champion
Looking Ahead

Future Enhancements

• Intelliplex/ODBC
• Machine Interface
• Serialization Process Efficiency
• Kanban Module?
• Supplier EDI or Portal?
• Mexico Facility
• El Paso Warehouse or 3PL?
• JV Partner Integration/Collaboration
• Waterfall Charts
Questions?