Emerson Boosts Value Chain Execution Powered by Oracle Solutions from Infosys

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Safe Harbor Statement

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Program Agenda

1. Oracle Discrete Manufacturing Update
2. Emerson Overview
3. Supply Chain Solutions by Infosys at Emerson
4. Q&A
Oracle Discrete Manufacturing Update
Oracle Electronic Kanban Features Summary

- **Enhanced User Interface**
  - Embedded Analytics

- **Key Performance Indicators**
  - Inventory Health with respect to Safety Stock
  - Actual vs Planned Lead Time
  - Actual vs Planned Demand
  - Unmoved Cards

- **Enhanced Kanban Planning**
  - No dependence on Flow Routing
  - Ability to effect Plan on a future Date
  - Automatic cancellation of cards based on Plan
  - Item / Point of Use level planning
  - Plan using user defined attributes
  - Horizontal plan simulation
Oracle Electronic Kanban Features Summary

- Card Replenishment Order Consolidation
  - eg. Purchase Order Consolidation
- Automatic Replenishment of Cards
  - Virtual replenishment based on on hand
- Temporary Kanban Cards
  - Automatically retire on a pre specified date or after certain number of cycles
- iSupplier Portal Integration
  - Kanban Card centric view for Suppliers in addition to PO centric views
- APIs, Extensions & Business Events
  - Pull sequence, Card, Status change APIs for integration with other systems
- User Defined Card Statuses
  - Beyond system statuses such as Full, Empty etc
• Do we have enough material for work orders scheduled for today or for current shift?
• What is the extent of material shortage?
• Which work orders can be executed based on available material?
• When is short material expected to arrive?
• What is the impact of reprioritizing a work order?
Component Availability Features
Manage Unplanned Situations and Make Day 0 Adjustments to Plans

- View selection of Work Orders that are ‘Ready’ for Start
- Identify component shortages for current day or shift
- Define Rules to prioritize allocations of Components to Work Orders
- Workbench to view Shortages – Work Centric view or Component Centric view
- Ability to manually allocate or de-allocate Work Orders. Reprioritize Work Orders
- Complements Rapid Planning’s ‘Clean to Build’ feature

60% reduction in the order schedule- to-release process at Oracle’s manufacturing facility.
eKanban & Discrete MES Recent 12.2 Functional Enhancements

- Component Availability Management
- Express Complete Related Jobs
- Supervisor Review of Operator Times
- Support for Job, Operation, Components DFFs
- Ability to capture Clock In & Clock Out times at Assembly Serial Number Level
- Automatic Association of Assembly Serial Numbers to a Work Order

- Ability to Close Jobs with Pending OSP Requisitions or Purchase Orders
- Ability to Perform Move Transactions with Zero Quantity of Backflush Components
- eKanban - Card Status of 'In-Transit' during Inter-Org Transfers
- Additional Rest Services for Integration or building UIs
What’s Coming in Release 12.2.8

- Support for DFFs at Kanban Card & Pull Sequence Levels
- Kanban Card Visibility for Internal Suppliers
- Enable eKanban at Organization Level
- Receive Kanban Cards in a user specified Subinventory, Locator
- Show Blanket Purchase Agreement Information on Replenishments

- Prevent Completion of Work Orders with Open Component Requirements
- Ability to Specify Component Revision during Backflush
- Display of Bar Codes in MES Pages
- Configuration Option to Not Default Quantity in MSCA Transactions

WIP & Discrete MES
Oracle Adaptive Intelligent Apps for Manufacturing

- New SaaS on PaaS Analytical Cloud Application

- Data Lake that comprises of
  - Structured Data
  - Time Series Sensor Data
  - Unstructured Data

- OT data uniquely contextualized with IT
  Data from ERP/SCM/CRM/HCM Systems

- ERP Agnostic Application
  Supports On-Premise & Cloud Apps

- Provides Actionable Insights, Predictions
  Driven by Machine Learning, Data Mining & Artificial Intelligence
Integrated Cloud
Applications & Platform Services
Speaker Introduction

Manish Naik
- Principal Consultant / Program Manager at Infosys
- Over 15 years of consulting experience with ERP engagements
- Oracle MFG / SCM solution architect for global clients in discrete manufacturing and automation space
- Oracle certified 'E-Business Suite R12 SCM Implementation Specialist' and '11i Discrete Manufacturing Implementation Champion'
- Presented Oracle white papers in several conferences – Oracle Value Chain Summit, OAUG Collaborate, UKOUG Apps, DOAG Apps, APICS PDM, Oracle EBS Summit

Bruce Maier
- Business Process Lead Supply Chain / Manufacturing at Emerson Commercial & Residential Solutions
- Solution Design and Governance for implementations and ongoing enhancements
- Over 9 years’ experience in Oracle EBS 11i / R12
- Discrete Manufacturing (INV, BOM, WIP, CST, EAM, MES, PIM, E-Kanban, PO)
- Value Chain Planning (ASCP, APCC)
Presentation Agenda

• About Infosys, Emerson and InSinkErator

• Oracle at Emerson COMRES

• Oracle E-Kanban Overview

• E-Kanban Solution at InSinkErator

• Implementation Point of View

• Uptake of E-Kanban in Emerson

• Other Key Solutions

• Additional References

• Wrap-up / Q&A
About Emerson COMRES, InSinkErator and Infosys
Infosys - The next-generation technology services company

Infosys helps enterprises create and execute strategies for their digital transformation. We help our clients find the right problems to solve, and to solve these effectively. Our team of innovators, across the globe, is differentiated by the imagination, knowledge and experience, across industries and technologies that we bring to every project we undertake.

<table>
<thead>
<tr>
<th>Corporate</th>
<th>People</th>
<th>Learning</th>
<th>Purpose</th>
</tr>
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<tr>
<td>Founded in Pune, India in 1981</td>
<td>200,000+ employees globally</td>
<td>World's largest corporate university</td>
<td>Use advances in technology to amplify human potential</td>
</tr>
<tr>
<td>$10 billion in revenues</td>
<td>35% women employees</td>
<td>135,000+ employees trained in Design Thinking</td>
<td>$500 million innovation fund</td>
</tr>
<tr>
<td>1,191 clients</td>
<td>Automation repurposed 11,000 people's effort into more valuable tasks</td>
<td>17,435 engineers trained in 3+ programming languages</td>
<td>98.3% business is repeat business</td>
</tr>
<tr>
<td>Clients in over 45 countries</td>
<td>Zero Bench for sustained engagement of employees</td>
<td>15,000+ employees trained in new technologies &amp; platforms</td>
<td>2% of avg. net profits over 3 fiscals to Infosys Foundation</td>
</tr>
<tr>
<td>84 offices and 116 development centers</td>
<td>15,000 projects driven by employees innovating through Zero Distance</td>
<td>967 employees mentored in executive leadership</td>
<td>Award winning sustainable delivery centers</td>
</tr>
</tbody>
</table>
Emerson – An Overview

**FOUNDED**
1890

**HEADQUARTERS IN**
ST. LOUIS, MO
USA

**RECOGNITION**
2017 FORTUNE 500
AMERICA’S LARGEST
CORPORATIONS BY REVENUE

Top 50 Employers
WOMEN ENGINEERS
MAGAZINE

America’s Best
Employers
FORBES MAGAZINE

**TWO BUSINESS PLATFORMS**

**EMERSON AUTOMATION SOLUTIONS**

**EMERSON COMMERCIAL & RESIDENTIAL SOLUTIONS**

**WORLDWIDE**

76,500 EMPLOYEES

200 MANUFACTURING LOCATIONS

**INNOVATION**
EMERSON EMPLOYEES WERE AWARDED MORE THAN 2,100 PATENTS WORLDWIDE IN 2017

**RECOGNITION**

#139 2017 FORTUNE 500
AMERICA’S LARGEST
CORPORATIONS BY REVENUE

**61 YEARS**
CONSECUTIVE YEARS OF INCREASED DIVIDENDS

**$15.3 BILLION**
IN GLOBAL SALES
FISCAL YEAR 2017

**$2.64**
Earnings Per Share*

**$1.92**
Dividends Per Share

**NYSE:**
EMR

Our Brand Promise
Emerson is where technology and engineering come together to create solutions for the benefit of our customers, driven without compromise for a world in action.
About Emerson Commercial and Residential Solutions

Improving the Quality of People’s Lives Around the World

Industries Served include:
- Construction
- Commercial Buildings
- Food Retail
- Food Service
- Transportation
- Contractor
- Homeowners

Core Expertise:
- Heating, Air Conditioning and Refrigeration
- Human Comfort
- Cold Chain
- Monitoring Systems and Facility Controls
- Food Waste Solutions
- Home Repair and Maintenance
- Construction and Plumbing Tools

Our Brands include:
- Copeland
- InSinkErator
- Grind2Energy
- ProAct
- RIDGID
- Sensi

Sales
$5.9 billion

Employees
~26,500

Customers include:
- Amazon, Daikin-Goodman,
  The Home Depot, Ingersoll-Rand,
  Johnson Controls, Lennox, Lowe's,
  Midea, United Refrigeration,
  United Technologies, Wolseley,
  W.W. Grainger
About InSinkErator ®

Founded 1938
Headquarters in Racine, WI USA

Our People
1,300+ Worldwide

Disposer Supplier

Vertically Integrated Manufacturer

300+ Patents Worldwide

Category Stewardship

Celebrating Water Efficiency and Excellence in the Field of Residential and Commercial Recycling Systems

Infosys
Emerson
Commercial & Residential Solutions

InSinkErator
Oracle at Emerson COMRES
Oracle at Emerson Commercial & Residential Solutions

• Oracle E-Business Suite is the primary ERP system
• Single global ERP environment across business units
• Operational since past 10 years - Recently upgraded to the 12.2.4

• Pre-defined solution sets and implementation standards
• Governance mechanism through CoE and Architecture teams
• Stage Gate Process
Coming up in this presentation:

- E-Kanban Solution
- iSupplier and MSCA Integration with E-Kanban
- RFID Integrated Supply Chain Solutions
- Sensor Based Manufacturing Interface
- Manufacturing Execution System

Oracle Powered Solutions by Infosys
Oracle E-Kanban Overview
Oracle E-Kanban Overview

- Available only in Oracle EBS release 12.2+
  - No plans of back-porting to release 12.1 or lower
- Oracle Manufacturing Execution System (MES) has to be licensed to enable E-Kanban
  - Licensing requirement only - Not mandatory to configure and use MES to be able to use E-Kanban
- E-Kanban supports ‘Internal’ and ‘Supplier’ Kanban
  - ‘Customer’ Kanban not in the near term roadmap of development
- Complete inventory management solution to enhance traditional Kanban:
  - Dashboards
  - Interactive graphical user interface
  - Integration, reporting and simulation capabilities
Day-to-Day Operations’ Portal
Inventory Health Monitoring Dashboard / KPIs
E-Kanban Solution at InSinkErator
Business Requirement / Challenge Prior to E-Kanban

- High velocity and large volume manufacturer
- Fast paced replenishment to support high speed of material movement
- No out-of-the-box integration between 3rd party Kanban solution and legacy ERP
- Reporting on KPIs and Metrics not feasible
- Suppliers could not be included in end-to-end process
- Non-standardized layout for cards and labels
- Inter-org Kanban process not possible
- Overall inventory health monitoring unavailable
Using E-Kanban user interface, key inventory transactions completed using a single dashboard

- Replenish, Receive and Transfer
- Very useful where material is received by scanning Kanban card numbers (not possible through Inventory)
- Ability to scan multiple cards
Integration with Mobile Supply Chain Applications and iSupplier

1105: Card supply status is changed successfully for card: 1105
Implementation Point of View
Key Learnings / Implementation Considerations

- Manage site level profile ‘FLM: Enable E-Kanban’
- Retrofit existing interfaces / User training
- Print Kanban cards from iSupplier portal
- Kanban card replenish program extension
- Going mobile with E-Kanban
- E-Kanban with iSupplier Do’s and Don’ts

Ongoing E-Kanban enhancements
Best Practices for Monitoring Inventory Health with E-Kanban

- Inventory health calculated by E-Kanban dashboard
- Regularly review items with ‘Bad Inventory Health’
- Revisit demand, lead times and its variability
- Update pull sequence as per supply/demand
- Perform card simulation for projected inventory
- Plan for additional cards (either temporary or regular)
- Emphasize on unmoved cards – Expedite with source
- Update Planned v/s Actual Tolerance values
Business Benefits to Emerson InSinkErator

- Improved visibility and control of inventory
- Ability to calculate and maintain optimum inventory
- Monitor inventory health based on pre-defined KPIs
- Efficient collaboration with iSupplier integration
- View project inventory through horizontal planning
- Personalized, printable Kanban cards
- Quick turnaround by real-time propagation of cues
Uptake of E-Kanban in Emerson
Uptake of E-Kanban in Emerson

✓ InSinkErator is the early adopter of E-Kanban in Emerson
✓ Success at InSinkErator → Set stage for other business units

May 2017
Emerson Commercial & Residential Solutions – InSinkErator
3 sites in US
Live!

Apr 2018
Emerson Climate Technologies
1 site in US
In Process

Nov 2018
Emerson Automation Solutions - ASCO
2 sites in US
1 site in Mexico
1 site in Canada
In Process

TBD
Emerson ComRes and Automation Solutions
Other sites in US, Europe, Asia
Under Consideration

InSinkErator is the early adopter of E-Kanban in Emerson
Success at InSinkErator → Set stage for other business units
Other Key Solutions

- RFID Integrated Supply Chain Solutions
- Robotics and Sensor Based Manufacturing Interface
- Manufacturing Execution System
RFID Integrated Supply Chain Solutions
Finished Goods Palletizer and Shipment Interface in Factory

Pallet with Programmed RFID tag

Finished Goods Assembly Lines

Palletizer Robot
* Skid built as per RFID (SKU and Quantity)

Manually Packed Pallets

Stretch Wrap Station

Apply Data Matrix Label

Load Pallets into Trucks for Shipment to Warehouse

RFID Readers at Loading Docks

Database

Interface

• Batch Processing
• Error Handling
• Exception Reporting

CLOSE TRUCK

Material Flow

Data/Transaction Flow

• WIP Job Completion
• Inventory Backflush
• Inter-Org Shipment
• Manifest Report

WAREHOUSE
Finished Goods Receiving Interface in Warehouse

- Entire consignment identified based on first pallet unloaded
- All shipments in consignment sent to Oracle for receiving
- Receive Inter-Org Shipments
- Job Scheduled every 15 minutes

Parallel Processes:

- First Pallet Unloaded From Truck
- RFID Readers at Unloading Docks
- Other Pallets Unloaded Hold in Receiving Area (15 minutes)

Material Flow

Data/Transaction Flow

Fix Errors

- Print Error Labels and Affix to Pallets
- NO ERRORS
- Digital Dashboard
  - Missed Scans
  - Oracle Errors

NO ERRORS

- Shipments with no errors only

Fix Errors
Sensor Based Manufacturing Interface
Sensor Based Manufacturing Interface

- **Steel Rolls**
- **Steel Bars**
- **Punch Presses (Slitter / Stamper)**
- **Machine Database**
- **ORACLE**
- **Material Flow**
- **Data/Transaction Flow**
- **Semi-Finished Steel**
- **Robotic Operations**
- **Sensor Driven Operations**
- **Interface**
  - Work Orderless Completion
  - Inventory Backflush
- **Interface**
  - Batch Processing
  - Exception Reporting
  - Error Handling
  - Standard APIs

**ASSEMBLY**
Manufacturing Execution System
Oracle MES Background

- Oracle Manufacturing Execution System (MES) available in EBS release 12.1 onward
- Revamped version of the traditional and most commonly used manufacturing module (Oracle WIP)
- Web Based Dashboard User Interface
- Peripheral module – Can be implemented later
- Hosted, distributed and co-existent options possible
- Out of the box integration with E-Kanban and MSCA
MES Solution at InSinkErator

• First implementation of Oracle MES in Emerson at InSinkErator (early adopter)

• Tailored solutions implemented to facilitate commonly followed shop floor processes

• Personalized Operator and Supervisor Dashboards tied to Work Centers and Dispatch Lists

• Work on multiple jobs together, Clock in/out

• Print client specific Shop Packet and Job Traveler from standard MES buttons through OAF extensions
Additional References
More information and related learning at:

- Presentation at Oracle Value Chain Summit ’15
  Poka-Yoking and Automating the Manufacturing Function to Unlock Hidden Value

- White paper presented at OAUG Collaborate ‘16:

- Article published on Infosys blogs portal – ’17
  http://www.infosysblogs.com/oracle/2017/02/oracle_r12_shop_floor_fooprin.html

- Presentation scheduled at OAUG Collaborate ‘18:
  Achieving Operational Excellence by Oracle Manufacturing Driven Smart Factory
  https://app.attendcollaborate.com/event/member/448483
Wrap-up / Q&A

In case of any questions/clarifications, please write to us at:
Manish Naik@Infosys.com
Bruce.Maier@Emerson.com

Stay Connected
To discuss more on this or for any other query on SCM solutions, please meet the speaker and other experts at our **Kiosk - 508**
Thank You

Please refer to Appendix section that follows for additional information about these solutions.
Appendix

• E-Kanban Configurations and Implementation Considerations – Details

• MES extensions at InSinkErator
E-Kanban - Additional Details
Scope Identification

- Large number of subassemblies and purchased items identified to be Kanban planned
- Source of replenishment, frequency of replenishment and size of replenishments determined
- E-Kanban process segregated into three categories based on the inventory source:
  - Production: Work orders for items manufactured in-house
  - Inter Org: Transfer products across multiple sites
  - Supplier: Nearly 100+ Kanban suppliers
Configurations

- Profile Options:
  - FLM: Enable E-Kanban = Yes *(Site Level)*
  - External ADF Application URL = http://<host>:<port>
- Menu: FLM eKanban Home Page
- E-Kanban Parameters (Site or Org level)
- Pull Sequence
  - Source of Replenishment – Make, Buy, Transfer
  - Source – Transfer from Organization or Supplier
  - Kanban Card Size
  - Number of Kanban Cards
Integration with iSupplier

- Out-of-the-box integration
  - Kanban tab added in iSupplier portal post enabling integration
- Suppliers automatically notified when Kanban card is ready
  - Ability to view and print their own cards
  - Ability to mark a Kanban card as ‘In Process’ so that buyers would know that it is being worked upon

Integration with MSCA

- Out-of-the-box integration
  - Standard with MSCA
  - Possibility of extension with MWA Express
- INV_MOB_KANBAN menu to be included in Oracle Mobile responsibilities
- Functions available:
  - Mobile Replenish Kanban
  - Mobile Auto Replenish Kanban
  - Mobile Move Order Kanban
Seeded ‘site level’ profile – FLM: Enable E-Kanban

- Enables E-Kanban and disables Inventory Kanban
- Modify profile setup to be updateable at responsibility level
  - Future patching might restore original setup
  - Enhancement request in process to make this standard
- Set to Yes at site level on a single global instance
  - Orgs that want to use E-Kanban → No change
  - Orgs that want to use Inventory Kanban → Set to No at responsibility level
    ✓ To be set for all responsibilities with Kanban process touch point (including ones that don’t have Kanban menus but interact with Kanban processes)
    ✓ Impact on any existing related interfaces with third party edge applications must be validated
• Kanban card print program extension
  - Includes bar codes for ease of transactions
  - Layout tailored to InSinkErator
  - Format compatible with 4x6 label printer

• Business event extension to print custom Kanban cards
  - Linked to ‘Print Cards’ button on E-Kanban portal
  - Spawns InSinkErator specific Kanban card report
Key Learnings / Implementation Considerations (continued..)

- Integration with Mobile Supply Chain Applications
  - Only Replenish option available. Receive by Kanban card number not available in standard menu

- Integration with iSupplier
  - Standard iSupplier portal menu in R12.2 is not pre-equipped with Kanban tab
  - Standard menu modification - Add iSP Kanban Tab menu in iSP HOMEPAGE Menu
  - Business unit specific iSupplier responsibilities:
    - Define nested menu with cyclic reference to personalized iSupplier main menu ‘iSP HOMEPAGE Menu’ containing Kanban submenu ‘iSP Kanban Tab’
    - Define new function to call this menu in web call - Example
    - Additionally, include standard menu iSP HOMEPAGE Menu in iSupplier menu tree without a prompt
MES Extensions
Oracle MES at InSinkErator

OAF personalization to spawn custom shop packet (job report) from standard MES action
Oracle MES at InSinkErator (continued..)

Custom shop packet (job report) spawned from standard MES action
Oracle MES at InSinkErator (continued..)

OAF personalization to spawn move tag (label) from standard MES action

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**MES Workstation**

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<tr>
<th>Last Updated</th>
<th>15-Jan-2018 02:41:54</th>
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<tr>
<td>Shift</td>
<td>1 (07:00:00 - 15:00:00)</td>
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</table>

**View Options**

- **Department**
- **Resource**
- **Instance**

**Dispatch List**

<table>
<thead>
<tr>
<th>Select Job Op: Badge</th>
<th>Move and Complete (5)</th>
<th>Reschedule Operation</th>
<th>Actions</th>
<th>Print Label</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Dispatch List Example

<table>
<thead>
<tr>
<th>Select Details</th>
<th>Job Op</th>
<th>Serialized</th>
<th>Ready</th>
<th>Start Date</th>
<th>Assembly</th>
<th>Total Qty</th>
<th>UOM</th>
<th>Exception</th>
<th>Customer</th>
<th>Shift</th>
<th>Express Move Qty</th>
<th>Complete</th>
<th>Scrap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3721335:1009</td>
<td>✔️</td>
<td>✗</td>
<td>29-Jun-2017 20:21:00</td>
<td>15260A</td>
<td>1</td>
<td>EA</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3696717:1009</td>
<td>✔️</td>
<td>✔️</td>
<td>17-Aug-2017 05:00:00</td>
<td>62593</td>
<td>28</td>
<td>85</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>4277152:1000</td>
<td>✔️</td>
<td>✗</td>
<td>13-Jul-2017 00:00:00</td>
<td>752240</td>
<td>300</td>
<td>EA</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
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</table>
Oracle MES at InSinkErator (continued..)

Custom move tag (label) spawned from standard MES action

<table>
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<th>Request ID</th>
<th>Name</th>
<th>Parent</th>
<th>Phase</th>
<th>Status</th>
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<tbody>
<tr>
<td>91519644</td>
<td>EMR WIP Move Tag ISE (E)</td>
<td></td>
<td>Completed</td>
<td>Normal</td>
</tr>
<tr>
<td>91519643</td>
<td>EMR WIP Move Tag Wrapp</td>
<td></td>
<td>Completed</td>
<td>Normal</td>
</tr>
</tbody>
</table>

MOVE TAG (RAC)

- Part Number: 02593
- Quantities: 350000
- Job: 3958717
Presentation Complete!