# Business Software

Growth Stage Manufactures

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# Golisano Institute for Sustainability

- **6 applied research centers focused around sustainable production**

- **$14M+ annually in sponsored & external funding**

- **3 graduate degrees in sustainability**

- **120+ researchers, engineers, faculty, and staff many with in-depth industry experience**

# COE Project Examples

## Remanufacturing



Durst US – Printhead reman



Office of Naval Research, USMC – Component reman

## Manufacturing Process Optimization



Markin – Process for corrosion resistant coating
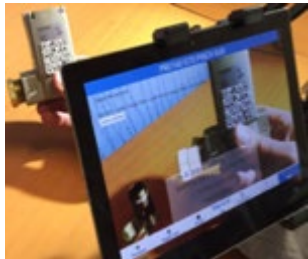


Gunlocke – Process efficiency



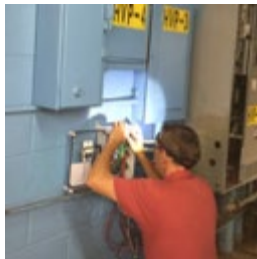GW Lisk – Inspection techn.



Alstom – Process failure mode analysis

## Digital Manufacturing



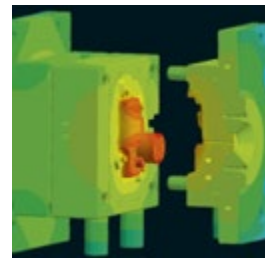Optipro, Optimax, Harbec – Electronic work instructions



Acro – IOT, Energy monitoring and management

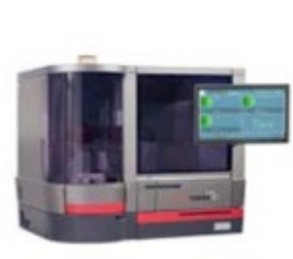## Product Development, and Design Optimization



Dresser Rand – Sustainable design



Tessy Plastics – New product design & analysis



Unilever – Generative design technology



Ortho Clinical – Design and material efficiency

# What is ERP?

- Enterprise resource planning (**ERP**) is **defined** as the ability to deliver an integrated suite of business applications. **ERP** tools share a common process and data model, covering broad and deep operational end-to-end processes, such as those found in finance, HR, distribution, manufacturing, service and the supply chain.

https://www.gartner.com/it-glossary/enterprise-resource-planning-erp/



SAP
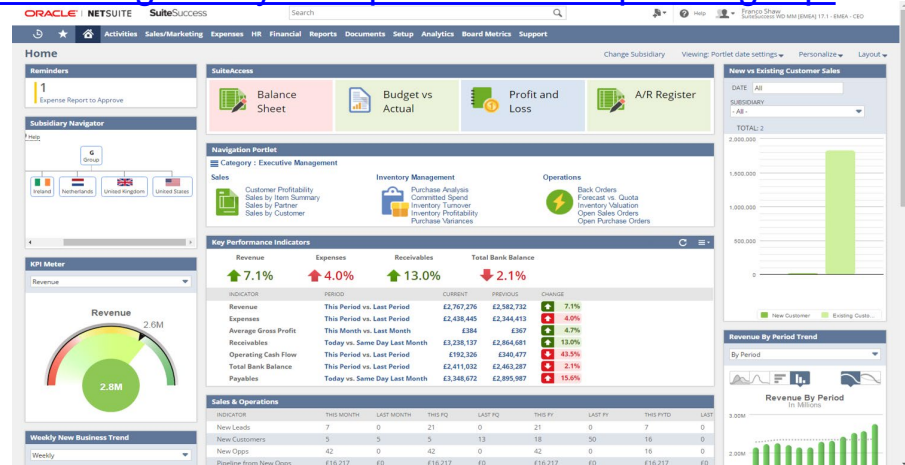


Oracle

# ERP vs. MES vs. MRP…

- **Enterprise Resource Planning**
  - o  All encompassing
- **Manufacturing Execution System**
  - o  Detailed planning of production.
- **Materials Resource Planning (as add on)**
  - o  No longer a standalone product – see ERP.
  - o  Inventory, production planning. But finance in other system.
- **Many specialized business software**
  - o  CRM/QMS/PLM/WMS…

# QuickBooks with 3rd party add ons

- **QB marketplace has add-ons for Materials Management, Production Planning, CRM, Timecards.**
  - A la carte ERP
  - Fishbowl is a popular MRP add-on.
- **Con: Multiple user interfaces, finger pointing.**

# ERP System Overview – Discrete Assembly

# CETEC ERP

VIEWS/LISTS ▾   PRICING MAINTENANCE ▾   VENDOR RETURNS   PART SPEC GROUPS   PRC LIST   REPORTS ▾
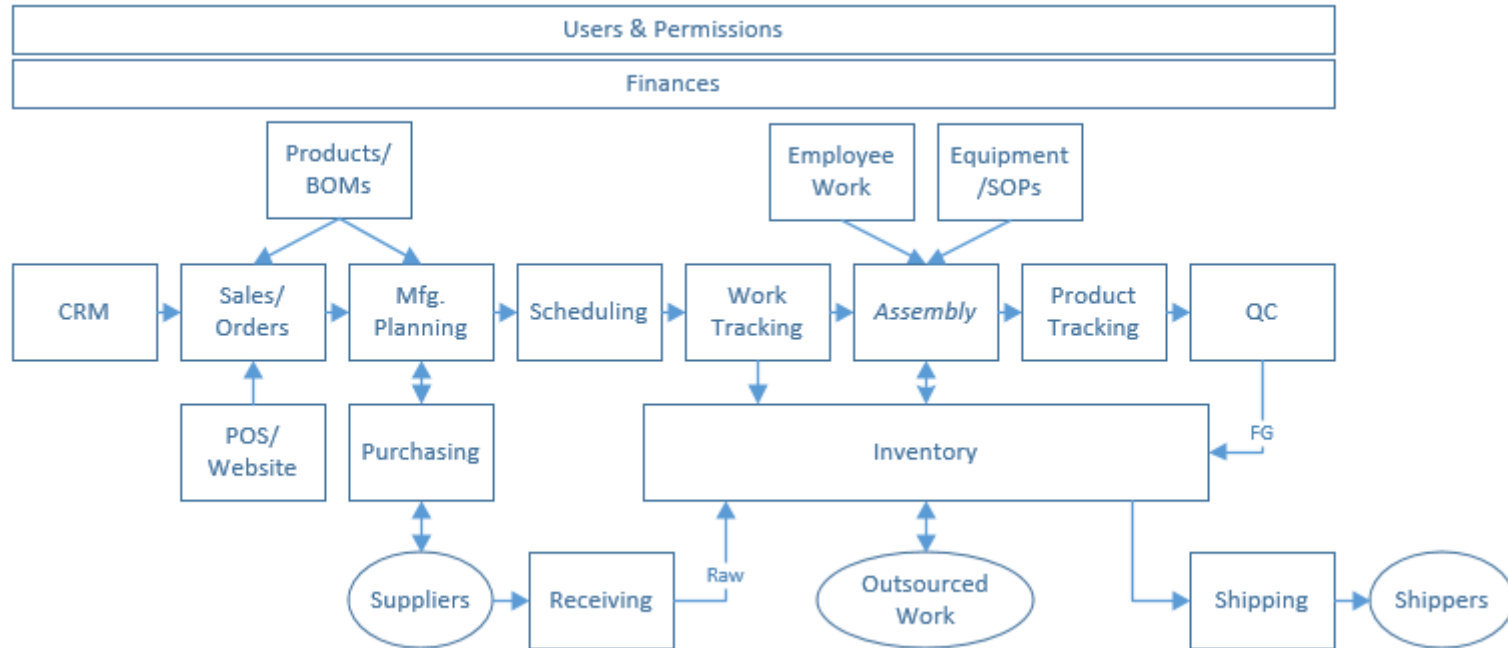
# Part RAWJ343-0003-002

## 15ml Disposable Pipets

VIEW
EDIT
BOM USE (3)
PRICING
QUOTES (0)
ORDERS (1)
SALES HIST (0)
PQUOTES (0)
OPEN POS (0)
WATERFALL
PO HISTORY (1)
NCRS (0)
ECOS (0)
RMAS (0)
ORDERS W/ NEED (YES)
PART REQS (0)
TOOLS
HISTORY
CROSSES (0)
MAINT +
REVISIONS
PRINT LABELS
DOCUMENTS (0)
NOTES (0)

### PART INFO

| | | | | | |
|---|---|---|---|---|---|
| Description | 15ml Disposable Pipets | | | Revision | (unnamed) |
| Default Cost | $0.00 | Default Resale | $0.00 | Pricing Rules | |
| Last Buy Cost | $0.00 | Created On | 2019-04-12 | Shelf Life | 0 |
| Revenue G/L Account | | COS G/L Account | | RoHS | No |
| Preferred Vendor | BPI | Preferred Manufacturer | BPI Molding | OEM Part # | Pipet, 15ml |
| UOM | EA | Purchase UOM | EA | Export (ECCN) | |

### ▾ WAREHOUSE: MN - MAIN ✎

[Warehouse Transfer] [Vendor Return]

| | | | | | |
|---|---|---|---|---|---|
| Avg Cost | $0.00 | | | | |
| Cost For Loc | $0.00 | Resale For Loc | | | |
| QOH | 65000 EA | QR | 25000 EA | Qty Avail | 40000 EA |
| QOO | 0 EA | Total Backlog | 0 EA | MOQ | (1 EA) |
| Std Cost | 0 | Std Package | 500 | Lead Time (in weeks) | 1 |
| Commodity Code | | ABC Code | | Country of Origin | |
| Tariff (HTS) | | | | | |

# CETEC ERP

# Manufacturing

Overview   Operations   Planning   Master Data   Reporting   Configuration

Products / [F344-0008-005] Display Carton for Liban MM19-200

**EDIT**   CREATE

Print ▾   Action ▾

UPDATE QTY ON HAND    REPLENISH

| 0.000 EA On Hand | 0.000 EA Forecasted | ↕ Product Moves | Min: 0.00 Max: 0.00 | ⚙ Routes | Lot/Serial Number | 50.00 EA Purchased | More ▾ |

# Display Carton for Liban MM19-200

☐ **Can be Sold**
☑ **Can be Purchased**

**General Information**   Purchase   Inventory

| | | | |
|---|---|---|---|
| **Product Type** | Storable Product | **Sales Price** | $ 0.00 |
| **Product Category** | All | **Customer Taxes** | Tax 15.00% |
| **Internal Reference** | F344-0008-005 | TaxCloud Category | |
| Barcode | | **Cost** | $ 0.00 |
| | | **Unit of Measure** | EA |
| | | **Purchase Unit of Measure** | EA |

**Internal Notes**

Odoo

🧶 spindl　〉 Manufacturing 〉 BOM 〉 BOM-Coffee Maker-001

Search or type a command (Ctrl + G)　　🔔　Help ⌄

## BOM-Coffee Maker-001　• Default

Update Cost　　Browse BOM　　New Version　　Create ⌄　　‹　›　🖨　···　Cancel

♡ 0 · 💬 0　　FOLLOW

**You** edited this
22 hours ago

**You** created this
22 hours ago

Operations

| | No. | Operation * | Workstation | Operation Time * | Fixed Ti... | Operating Cost (INR) | ⚙ |
|---|---|---|---|---|---|---|---|
| ☐ | 1 | **Cutting** | Fabric Cutting Station | 10 | ☐ | ₹ 2.92 | ✎ Edit |
| ☐ | 2 | **Labelling** | Labelling Station | 20 | ☐ | ₹ 3.33 | ✎ Edit |
| ☐ | 3 | **Packing** | Packing Station | 15 | ☐ | ₹ 5.00 | ✎ Edit |

## Materials

☐ Quality Inspection Required

Items

| | No. | Item Code * | Qty * | UOM * | Rate (INR) * | Amount (INR) | ⚙ |
|---|---|---|---|---|---|---|---|
| ☐ | 1 | **Glass** | 5 | Nos | ₹ 0.00 | ₹ 0.00 | ✎ Edit |
| ☐ | 2 | **Plastic** | 7 | Nos | ₹ 5.00 | ₹ 35.00 | ✎ Edit |
| ☐ | 3 | **Rubber** | 3 | Nos | ₹ 3.00 | ₹ 9.00 | ✎ Edit |

## Costing

Operating Cost (INR)

₹ 11.25

Total Cost (INR)

₹ 55.25

Raw Material Cost (INR)

₹ 44.00

ERP Next

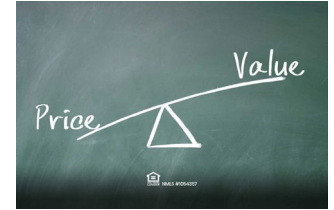ght © RIT

# Why business systems like ERP

- **Central resource**
  - Everyone sees the same data.
  - Single source of truth
- **Training on single system.**
- **Connected workflow – Customer order to Shipping**
  - No double entry!
- **Mange Inventory, plan production**
- **Reports on state of the business**
  - Dashboards with KPIs

# Key Value Propositions for using ERP systems

- **A real-time 360-degree view**  - your entire organization: income, costs, sales, capacity,
- **Data Driven Decision Making** – comprehensive data to make data driven decisions
- **Streamlined Operations** – all department data into a single platform providing transparency of data
- **Real Time Data & Reporting** – display KPIs of inventory, production, resources utilization, etc. with automated reports set to specific frequencies and people

- **Improved Inventory Management** – accurate transactional tracking with cost, volume and allocation to committed and potential jobs
- **Improved Supply Chain Management** – full procurement activities integrated into the system
- **Shop Floor Labor and Job Tracking** – Full production tracking of material, labor, production status and work center. Real time updates of ahead or behind delivery date
- **Manufacturing management** – scheduling, forecasting, resource planning, capacity planning

- **Scalability** – Enterprise systems are designed to grow with your growth
- **Data Security -** single database allows for multiple redundancies of security authentication
- **Compliance**  - accurate up-to-date searchable records to comply with regulations
- **Organized Work Flows** – digitally move work from one department to another

# When to implement an ERP application

- **Product complexity**
  - ○ Lots of configurations
- **Manufacturing complexity**
  - ○ Complex process routing/outsourcing/process timing
- **Supply Chain complexity**
  - ○ Multiple vendors/multiple purchasing units/variable lead times
- **Oversite**
  - ○ Business KPIs
  - ○ Regulatory requirements

# Different ERP Solutions

- **Industry Segmentation**
  - Aerospace, mining, food, machine shops, ship building, hospitals, distribution….
- **Manufacturing Modes**
  - Discrete, Engineered to order, job shop, light assembly….
- **Company size**
- **Product Differentiators**
  - Industry specific tools. i.e. stock calculators for machine shops.
  - Business process for industry regulatory requirements.
- **Avoid Customizations!**

# Package Listing Sites

- **https://www.top10erp.org/**
  - An online database of ERP options that can be sorted by industry. It provides a clear listing of major features for each package.

- **https://www.erpfocus.com/**
  - A resource center with guides and some recommendations for utilizing industry-specific features of an ERP.

- **https://sourceforge.net/directory/business-enterprise/enterprise/erp/**
  - This site has one of the largest lists of ERP product packages available (937 as of this writing this article). It allows you to build a list of different packages and to compare features between them.

- **https://blog.capterra.com/free-open-source-erp-software/**
  - This is a go-to stop for reviewing open-source ERP platform options.

- **https://www.g2.com/categories/erp-systems**
  - Revie and comparison site.

# Picking package

- **Pre-work**
  - What are your most complex process
  - Critical and Important features
  - Budget
- **Approach as a Selection Funnel**
  - Packages that target your industry, manufacturing approach and company size
  - Check out vendor websites and review sites
  - YouTube videos
  - Engage vendor sales – get demos

# Importance of Training

- **Adequate time for training of staff before go live**
  - Training of managers on analysis features.
- **Documentation for common ERP tasks**
  - Vendor how-to videos, YouTube videos
  - Company Standard Operating Procedures
- **Importance of complete data**
- **Need detailed oriented super user**
- **Complex packages => More powerful tools**

# Closing Comments

- **It is better to be centrally organized then distributed disorganized.**

- **You will be living with the software for years. Not the time to go cheap.**

- **It is a commitment!**

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# Thank you

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