

Design and
Implementation of an ERP
System through SAP
For Gaumard Scientific
Simulators

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## **Executive Summary**

Gaumard Scientific focuses on manufacturing simulators for Health Care Education.

Over the past half century, Gaumard has dedicated its resources to the continued development of innovative teaching simulators in nursing care, emergency care and OB/GYN. This project will focus on the design and implementation on an ERP System of the simulators for healthcare education.

The purpose of implementing an ERP system is to improve the business process, by identifying our resources and constraints and designing a more effective process for the procurement of materials, production and sales.

Phase 1 of this project will focus on three processes of Gaumard Scientific's current operations, produce, procure and sell. The current business process will be modeled using Integrated Definition, and Object Modeling Technique.

Phase 2 of the project will focus on the "To be Model", adding three additional processes, operations planning, human resources and financial management. The new design will include SAP operations recommendations that will be implemented upon approval of Gaumard's administration. SAP is a software application designed to stream line manufacturing processes.

# **Table of Contents**

Executive Summary	
Table of Contents	2
1.Company Overview for SAP Integration	3
1.1 Gaumard's History	3
1.2 Gaumard's Vision	3
1.3Company's Strategy	
1.4 Operation Mode	
1.5 Product Lines	5
2.Business Processes and Asessment	6
2.1 AS IS System Model	6
_2.1.1 Organizational Structure As-Is	1
_2.1.2 Bill of Materials	1
_2.1.3 IDEF0 Models As-Is	1
_2.1.4 Object Model As-Is	
_2.1.5 Dynamic Models As-Is	8
2.2 To-Be System Models	14
_2.2.1 Organizational Chart To-Be	15
_2.2.2 To Be Organization Structure	16
_2.2.3 IDEF0 System Model To-Be	17
_2.2.4 Object Model To-Be	25
_2.2.5 Dynamic Model To-Be	26
3. Business Implementation Overview	37
4. SAP Implementation	40
4.1 Business Implementation Plan	40
5 System Operations	57
5.1 Operations Planning	57
5.2 Human Resources Operations	63
5.3 Procurement Operations	65
5.3 Production Operations	70
5.4 Sales Operations	76
5.5 Financial Management Operations	82



## 1. Company Overview for SAP Integration

## 1.1 Gaumard's History

Gaumard Scientific traces its history to 1946 when its founder, a World War II trauma physician recognized how polymers used in reconstructive and battlefield surgery could be used to create simulators for health care education. The first product was a synthetic human skeleton. In 1949, Gaumard introduced a childbirth simulator, designed at the request of the international health community to improve clinical competence of village midwives in order to reduce maternal and infant mortality and morbidity.

Over the past half century, Gaumard has dedicated its resources to continued development of innovative teaching simulators in nursing care, emergency care and OB/GYN.

### 1.2 Gaumard's Vision

The philosophy of the founder is to design and manufacture innovation teaching simulators and sell them at an affordable price.

## 1.3 Company's Strategy

Gaumard Scientific is an innovator in the industry. They have a regional sales team and sales representatives nationwide that serve the United States and Overseas. The company is comprised of fifteen engineers with expertise in mechanical, biomedical, electrical engineering to meet overall design and production specifications. Gaumard Scientific has strong alliances in the health and educational industries.

Gaumard Scientific is undergoing rapid growth due to the high demand in the biomedical field to assist doctors, researches, medical students, therapists, and the educational industry overall. The company's technological advances include dynamic high fidelity models that simulate birthing, heart attacks, breathing blockage, trauma patients among many others.

Thus, Gaumard Scientific has the tools, the knowledge and competitive advantage to expand and continue to satisfy the needs of this very unique industry.

## 1.4 Operation Mode

Gaumard Scientific's operation mode is "made-to-stock". The company maintains a buffer inventory to ensure that are orders are fulfilled efficiently. Therefore, we will process in mind during the configuration of the "To-Be SAP Model".

### 1.5 Product Lines

Gaumard offers a wide variety for health care simulators consisting of high fidelity and low fidelity mannequins as well as task trainers. Listing detailed below:

### Nursing:

► Advanced Patient Care ► Adult Patient Care ► Pediatric and Neonatal Care ► Skills Trainers ► Injection and Infusion Trainers

### **OB/GYN:**

▶ Childbirth Simulators ▶ NOELLE® Birthing Simulators ▶ Women's Health ▶ Mens Health

#### **HIV and AIDS:**

▶HIV and AIDS

#### **Emergency**:

▶Advanced Emergency Care ▶Emergency Care ▶Multicode Simulators ▶Airway and CPR Trainers

### **Learning Solutions:**

►All books ►All CDs ►All DVDs ►1 And 3 Cameras

#### Value Packages:

<u>Maternal Health Care Training Package</u>
<u>Package Fraining Package</u>
<u>Package for Health Care Profession Students</u>
<u>Maternal and Child Care Training Package</u>

<u>Maternal and Child Care Training Package</u>

### Scope:

The scope of this project encompasses the design of an ERP System for Gaumard Scientific's manufacturing of simulators. The goal is to streamline existing processes for Operations

Planning, Human Resources, Procurement, Production, Sales and Financial Management for a "made -to-stock" production model. Upon completion Gaumard will receive a design that will include SAP system implementation recommendations, followed by the actual implementation of the system upon approval of the management team.

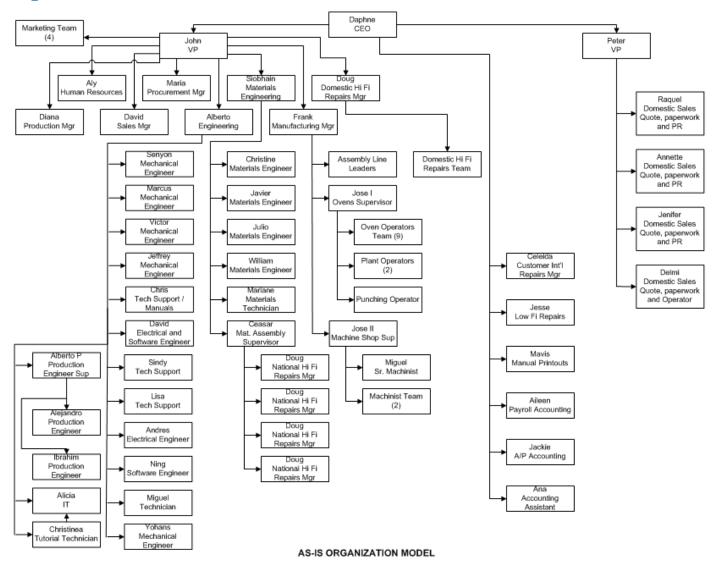


## 2. Business Processes and Assessment

## 2.1 AS IS System Model

For the As-Is Models for Gaumard Scientific we will present the Object Model, the Organizational Chart, the Dynamic Model, the Bill of Materials and Activity Model. This provides a simulation that represents the current situation as it is, without incorporating any changes or improvements, allowing a broad and clear view to analyze and study to apply lean manufacturing elements as well as effective and efficient management roles and cycles.

## 2.1.1 Organizational Structure As-Is





# 2.1.2 Bill of Materials

## Bill of Materials for the Health Care Education Simulator

Smooth-On	
Product	Quantity
Silicones	
Soma Foama	1
Ecoflex 0030	2
Ecoflex 0010	2
Dragon Skin Medium 10	2
Mold Max 15 T	1
Ecoflex 0050	3
Dragon Skin 20	3
Brush- On 40	3
Dragon Skin 30	2
Mold Star 15	1
Urethanes	
Smooth Cast 305	3
Task 18	4
Pigments	
Fuse FX Medium S-302	5
Fuse FX Tan Skin S-308	5
Fuse FX Warm Rosy Skin S-306	5
Fuse FX Light Skin S-301	5
Fuse FX Rosy Skin S-305	5
Silc Pig Blood	5
Silc Pig Fleshtone	5
Silc Pig Blue	5
Silc Pig White	5
Silc Pig Red	5
Silc Pig Brown	5
Silc Pig Yellow	5
Silc Pig Black	5
Accessories	
Sil-Poxy	3
Ease Release 200	3
Plat Cat	3
Silicone Thinner	3
Silicone Thixotropic Agent (Thi Vex II)	3
Slo Jo	3

BJB Enterprises	
Product	Quantity
TC 5101	2
TC 5005 C	2

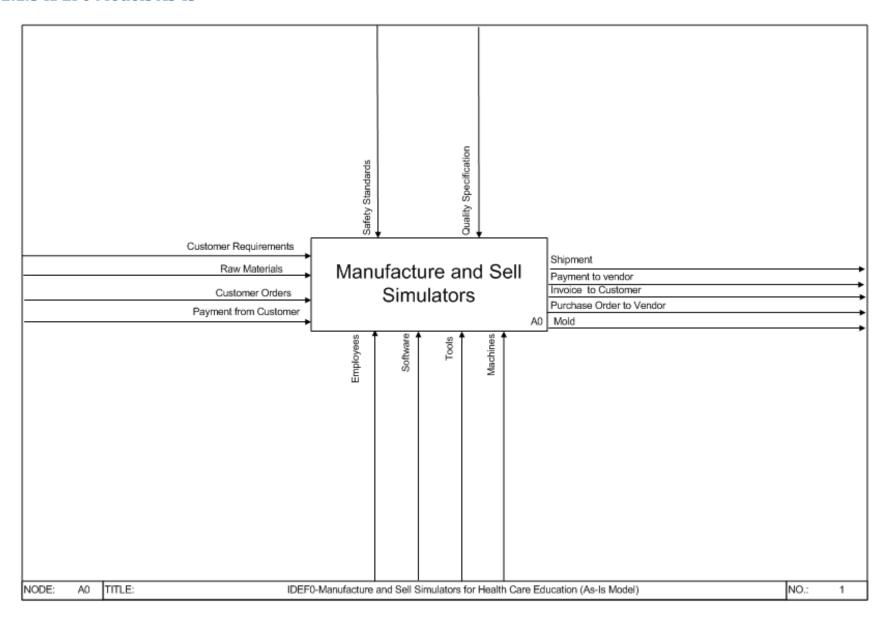
McMaster-Carr	
Product	Quantity
Tongue Depressors	2
BC 8165 Urethane Casting	2
Umbilical Cord Containers	3
M712 Luer Lock Manual Syringe /10 bag	
50 cc	3
Paint Stirrers	3

Hardware World	
Product	Quantity
1/2 pint	4
1 quart (32 oz)	3
2 1/2 quartz (2365 mL)	2
5 quartz (4730 mL)	5

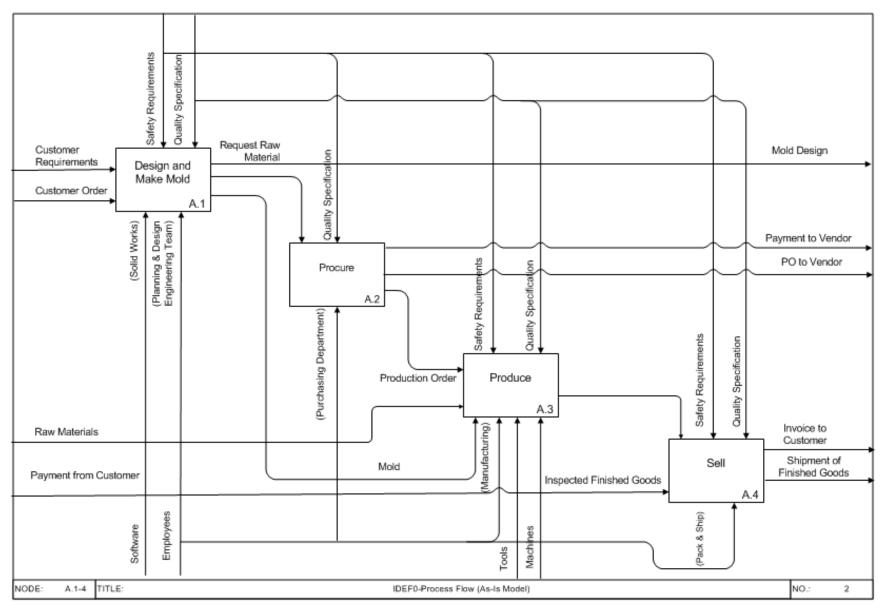
Ashby Cross	
Product	Quantity
400mL Dual Cartridge Containers	4
Static Mixers	20

SilPak	
Product	Quantity
Sil-Pack F-100	3

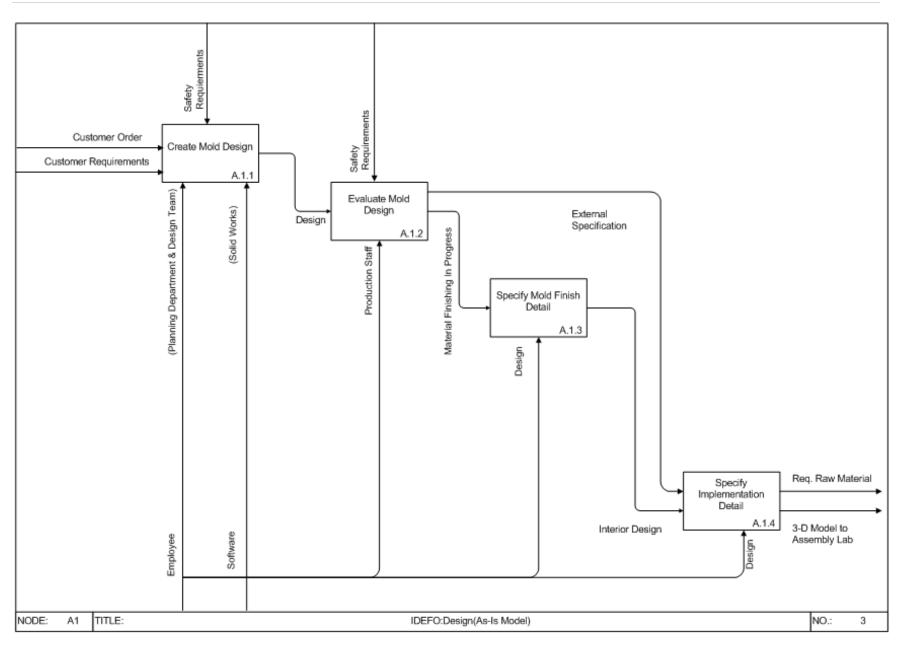
## 2.1.3 IDEF0 Models As-Is



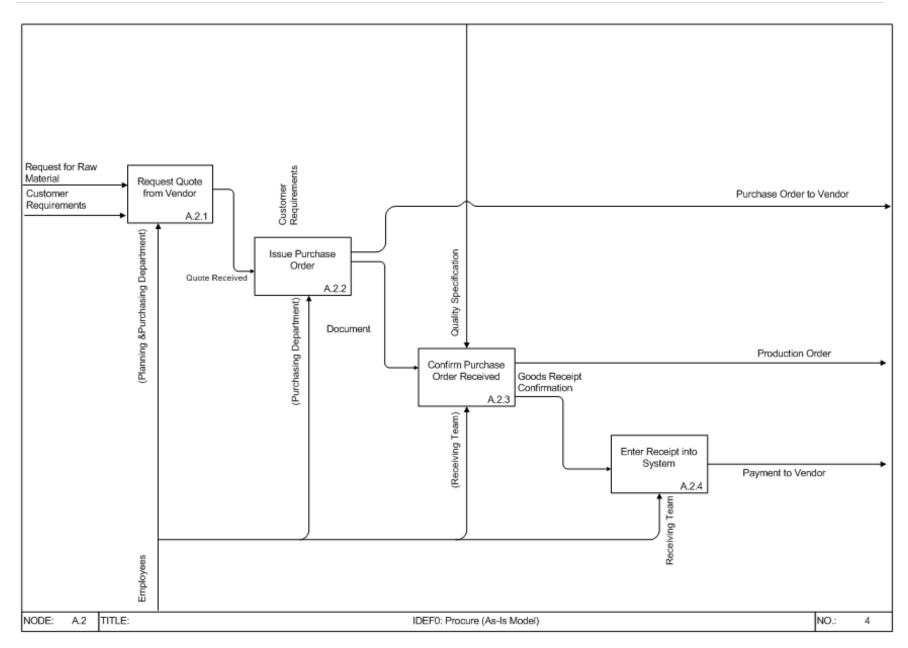




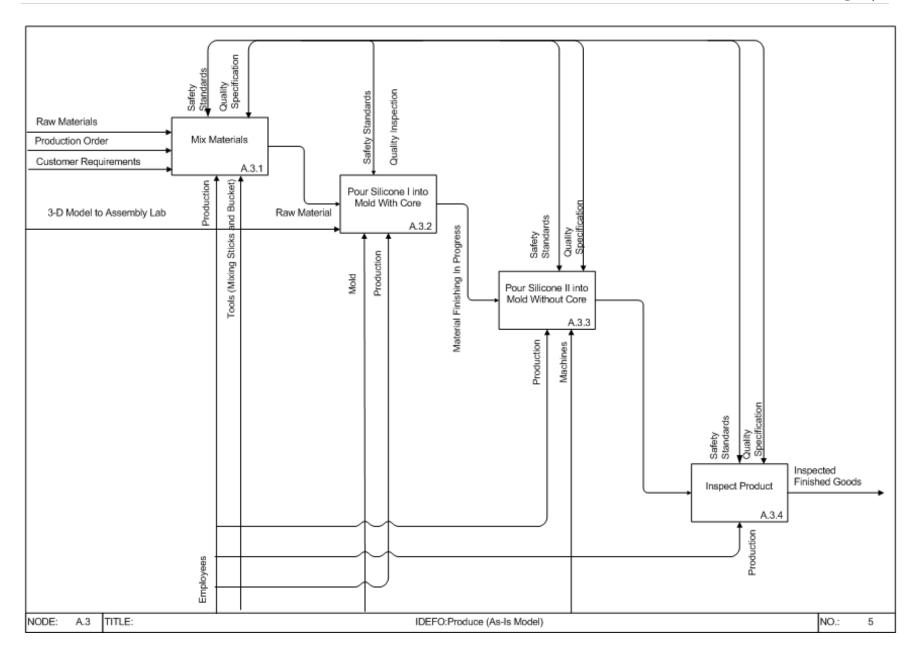




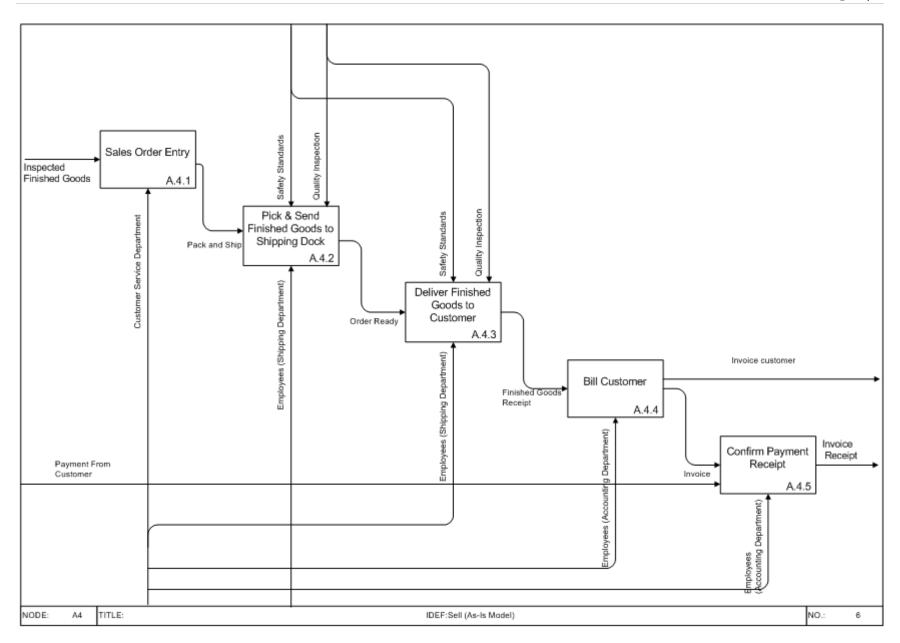






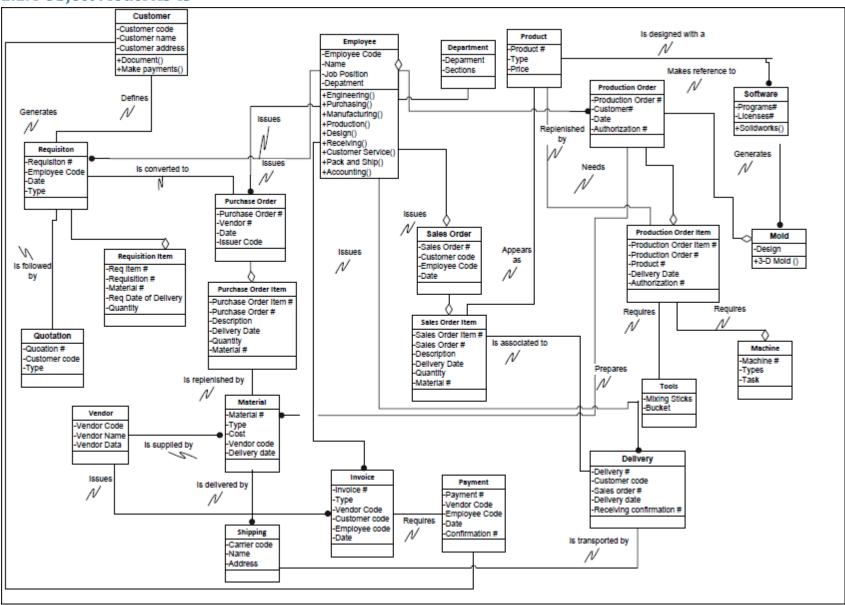






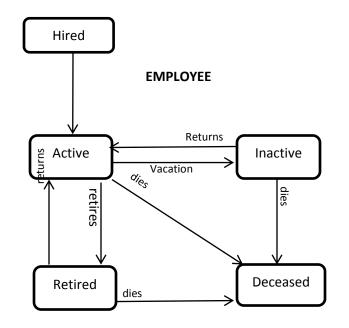


## 2.1.4 Object Model As-Is



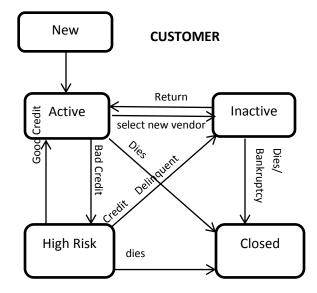


# 2.1.5 Dynamic Models As-Is

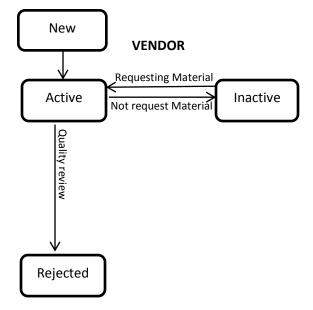


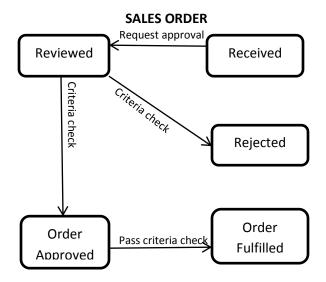
# **Dynamic Model**

(As-Is)



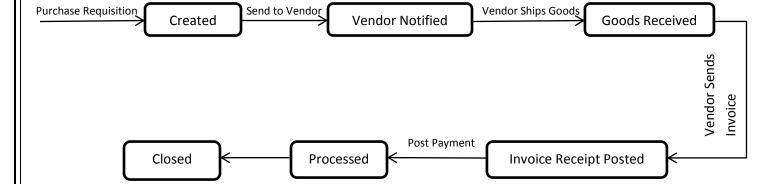




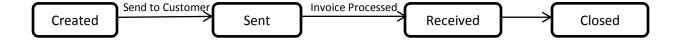




### **PURCHASE ORDER**

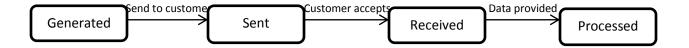


### **INVOICE TO CUSTOMER**





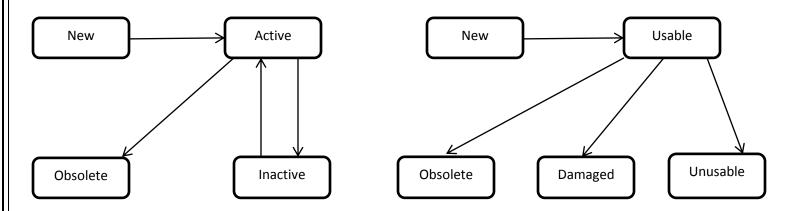
## **QUOTATION FOR CUSTOMER**



### **PRODUCTION ORDER**

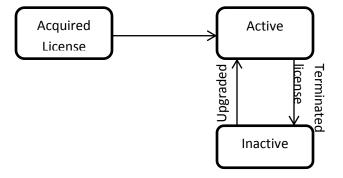


### MACHINE TOOLS



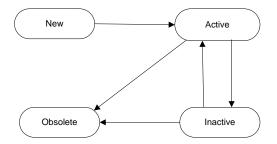


## **SOFTWARE**

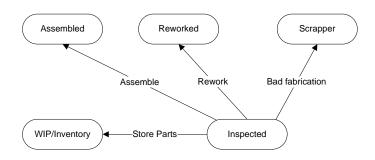




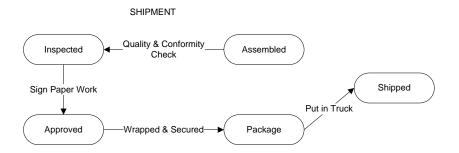
#### RAW MATERIALS

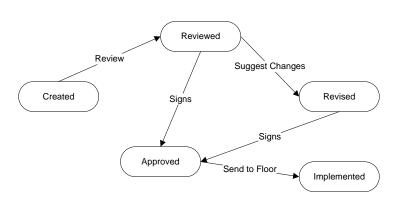


#### PRODUCT

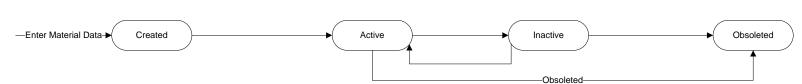


#### MOLD DESIGN









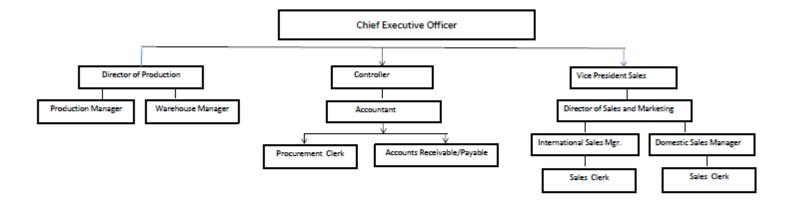
BOM



## 2.2 To-Be System Models

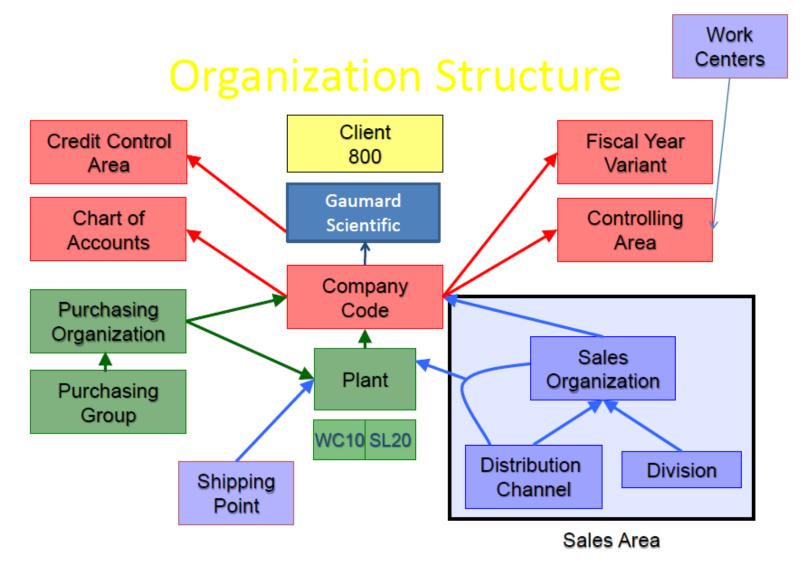
Once Models for the As-Is views has been established and analyzed, we can proceed with molding and setting the To-Be System Models that will provide a more efficient and effective enterprise structure. One important aspect for the To-Be system modeling is that the molds and creative effort utilized and applied in the process will solely be considered within the range of engineering tooling for mass production of the training breast and the baby skin and is out of scope; therefore, it will not be included in the To-Be Models. The following flowchart represents the desired SAP enterprise structure.

# 2.2.1 Organizational Chart To-Be



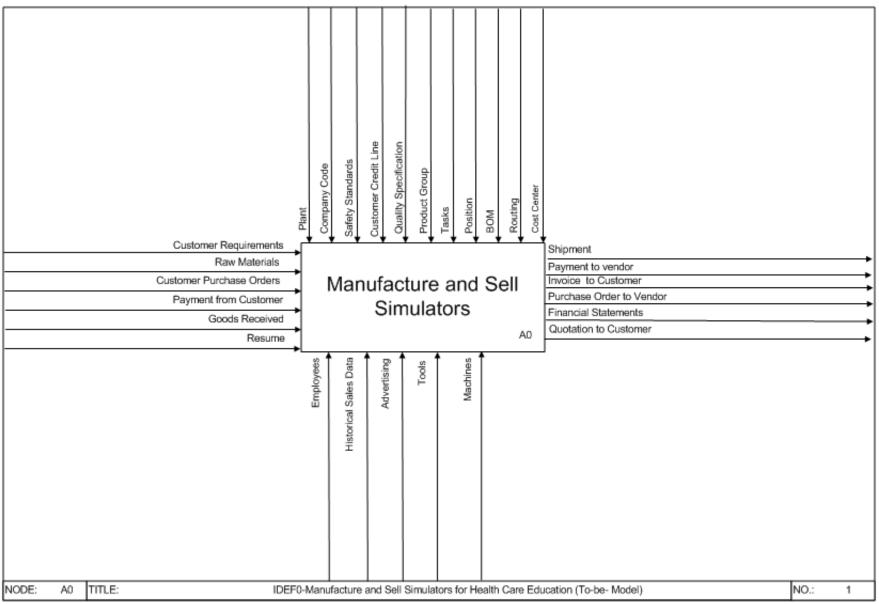


# 2.2.2 To Be Organization Structure

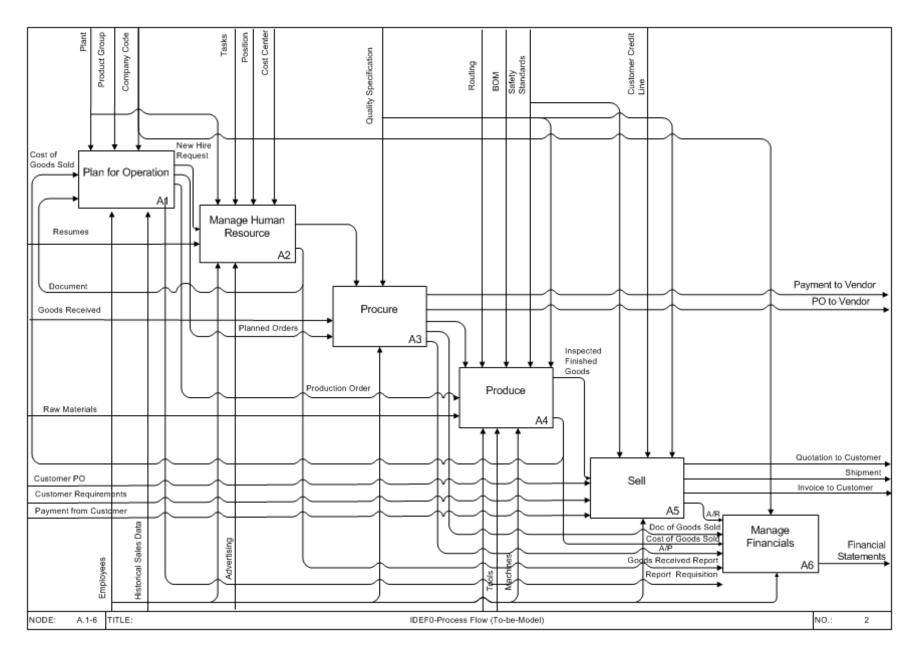




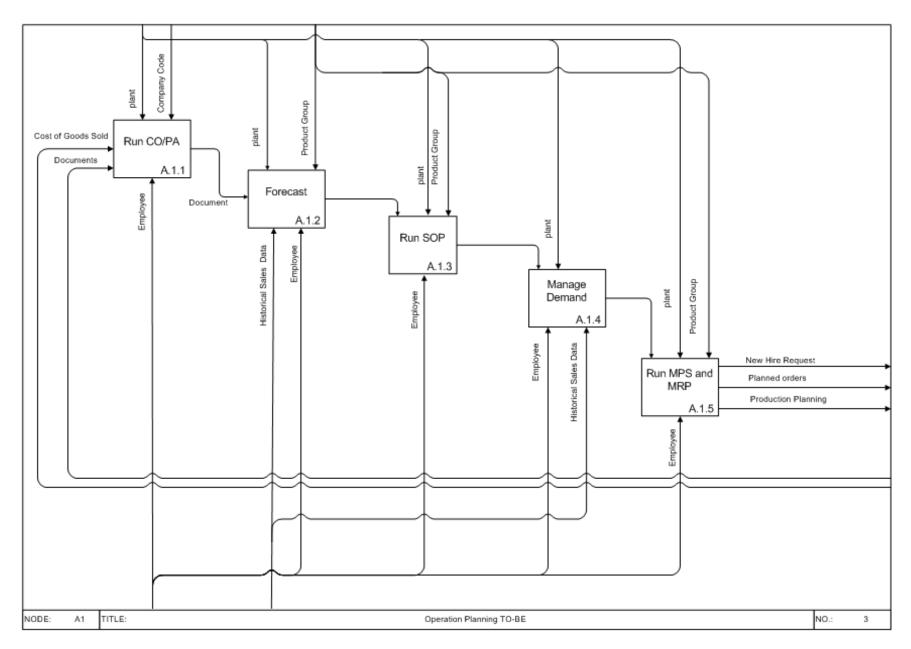
## 2.2.3 IDEF0 System Model To-Be



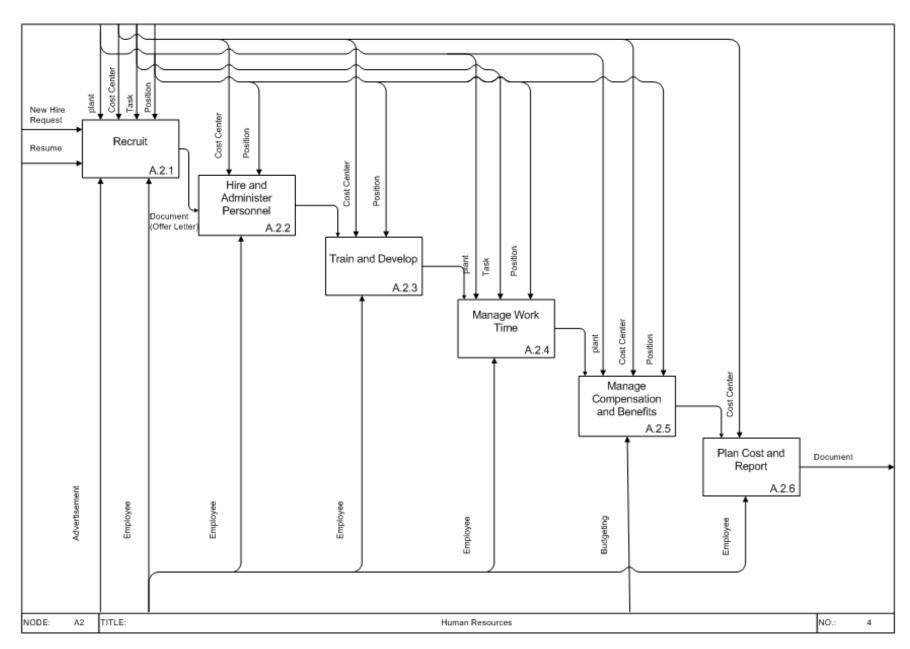




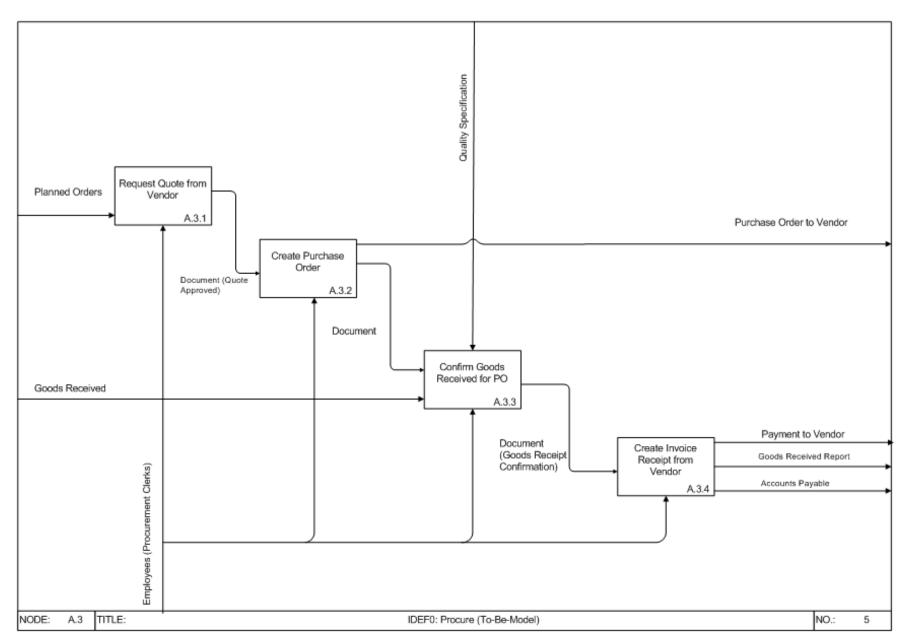




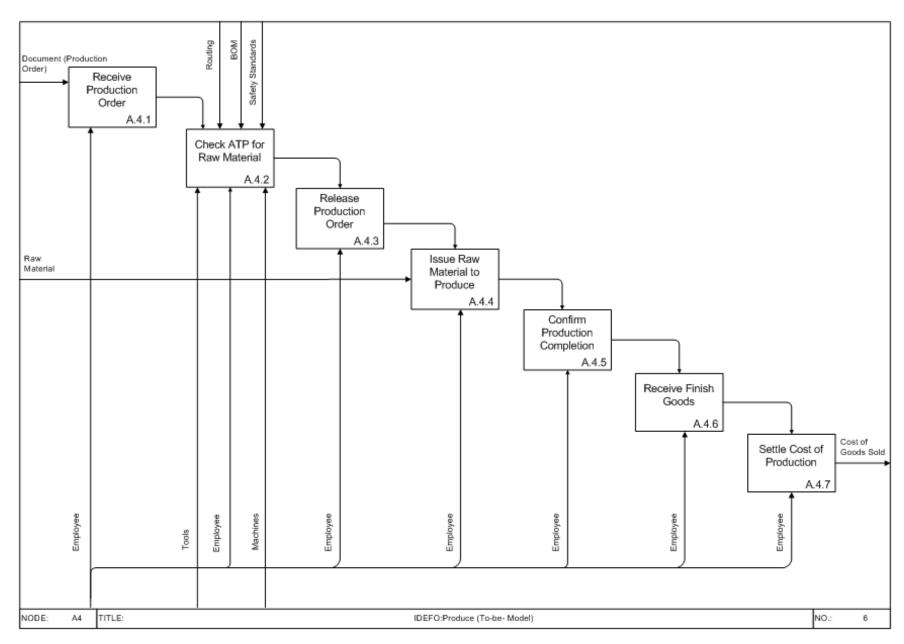




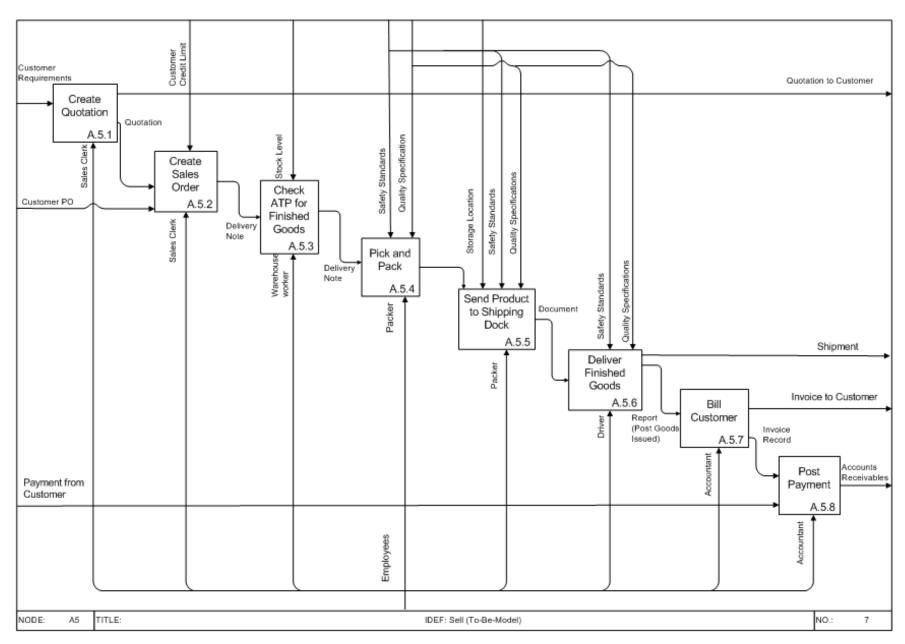




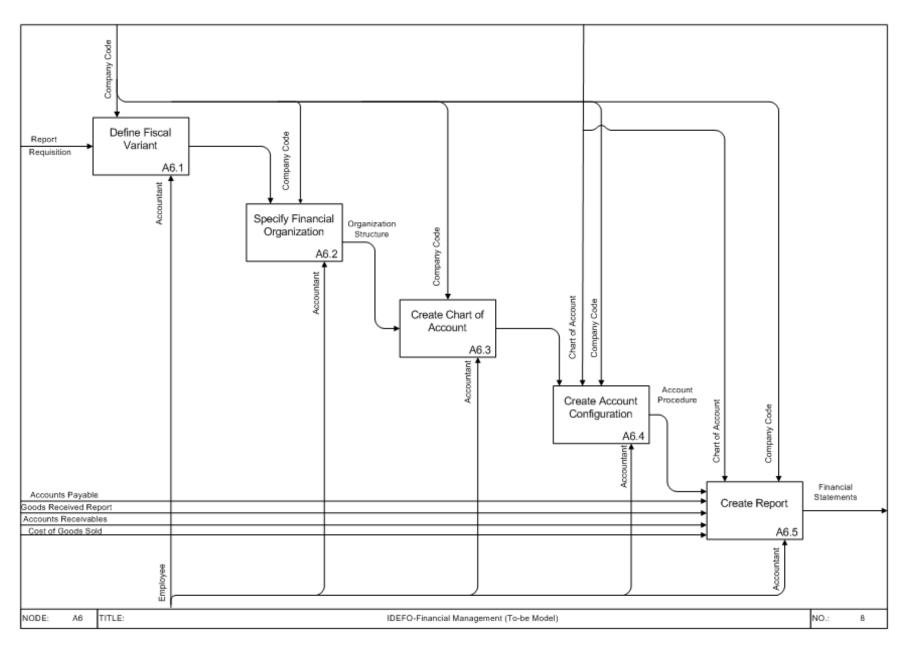






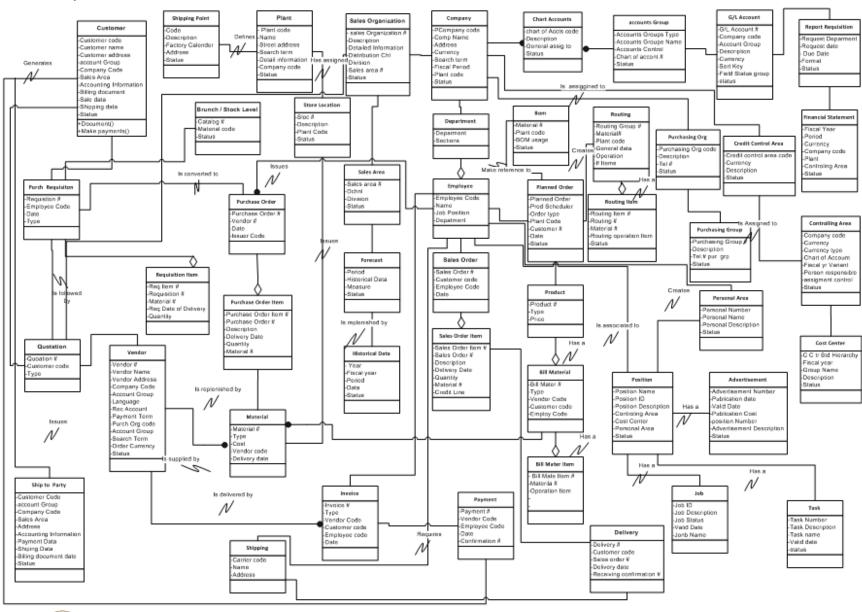




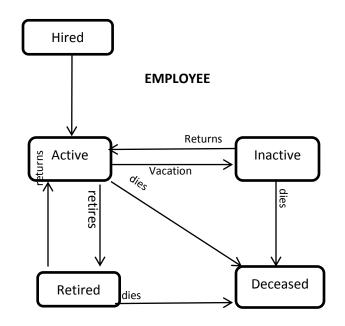




## 2.2.4 Object Model To-Be

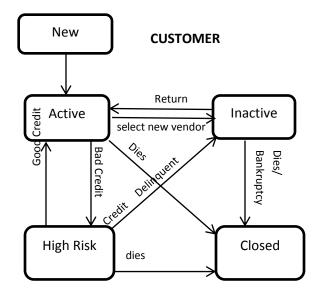


# 2.2.5 Dynamic Model To-Be

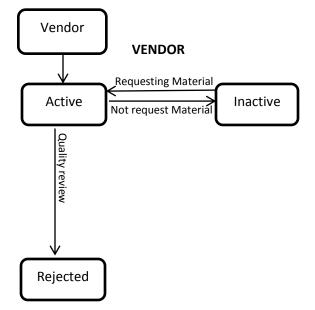


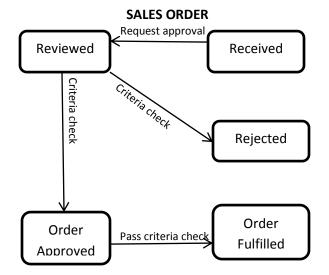
# **Dynamic Model**

(To-Be)



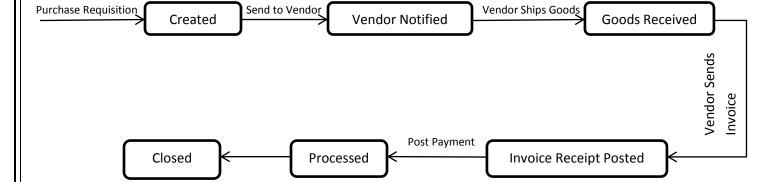




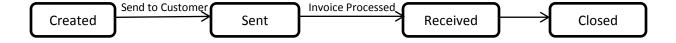




### **PURCHASE ORDER**

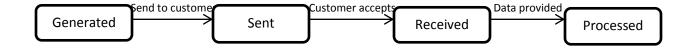


### **INVOICE TO CUSTOMER**





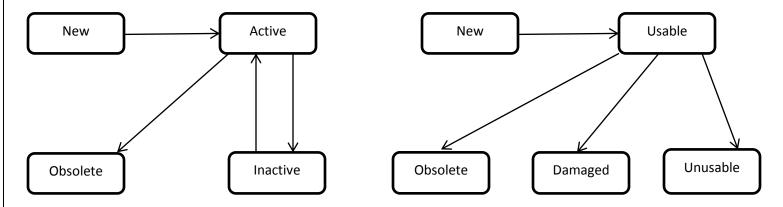
# **QUOTATION FOR CUSTOMER**



# **PRODUCTION ORDER**

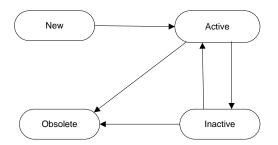


# MACHINE TOOLS

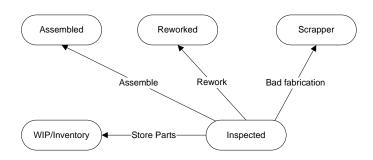




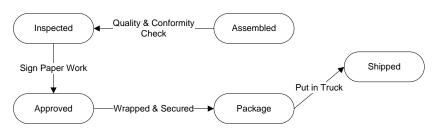
#### RAW MATERIALS



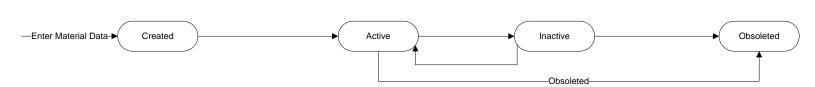
### PRODUCT



#### SHIPMENT



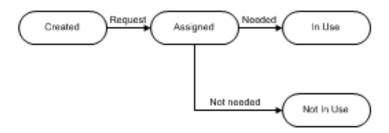
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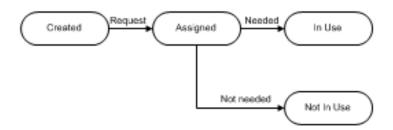




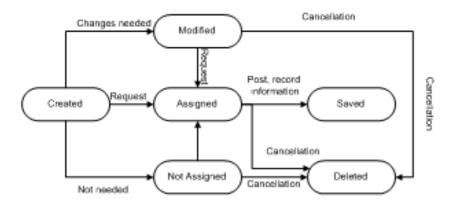
#### Sales Area



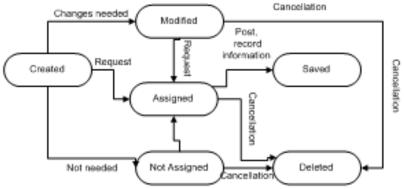
### Purchasing Group



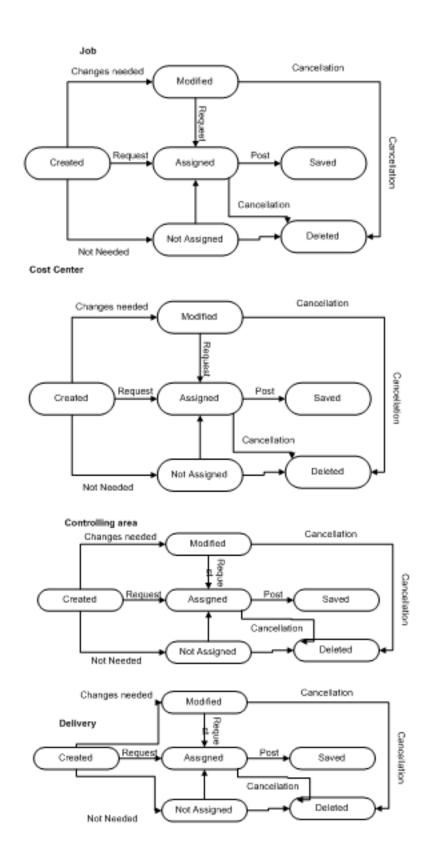
### Shipping Point



### Credit Control Area

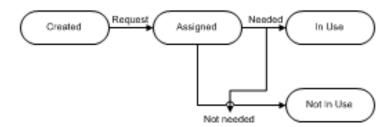




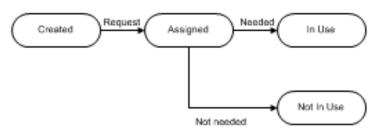




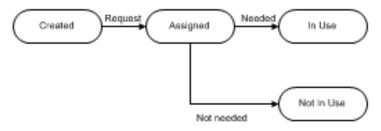
### Chart of Accounts



### Product Group



### Personnel Area

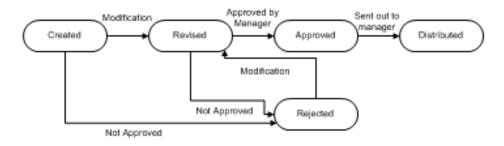


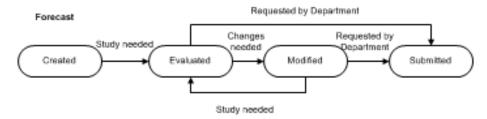
### Purchase Order

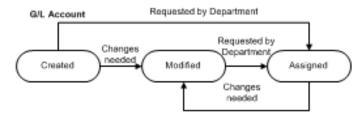


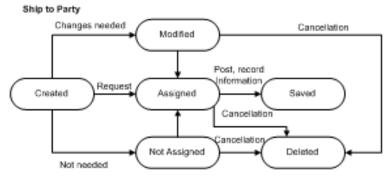


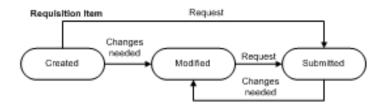
### Financial Statement







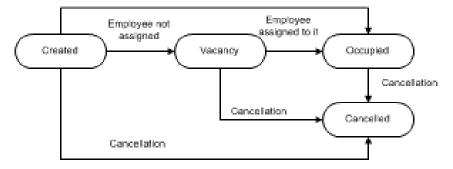


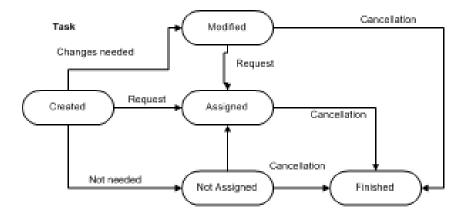




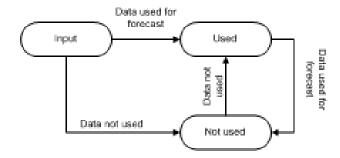
### Position

### Employee assigned to it





### Historical Data





# 3. Business Implementation Overview

Gaumard Scientific's Simulators for Health Care Education "As-is Model" has been successfully defined and established outlining in detail its process at each stage. This process was a great tool in identifying key components lacking in the lean manufacturing and management system. The next facet of the Enterprise project will be the actual configuration and implementation of the designed "To-be Model" in SAP.

### 1. Enterprise Organization Structure

- 1. Create one enterprise systems structure (company code, plant code, storage locations, sales org. purchasing org., and shipping points
- 2. Review your enterprise structure

### 2. Operation Planning

- 1. Create material master data for finished goods and raw materials
- 2. Create product groups
- 3. Create BOM and routing for the finished goods
- 4. Create historical data
- 5. Develop pricing strategy for different sales channels and customers
- 6. Conduct (mfg. & material) cost analysis
- 7. Create forecast for at least one finished product with different Alpha, Gamma, and Delta forecast factors.
- 8. Estimate budget and capacity based on the forecast
- 9. Create sales & operation plan (SOP)
- 10. Convert SOP to demand management

### 3. Financial Management

- 1. Create fiscal year variant, control area, and credit area
- 2. Review/modify/create G/L accounts
- 3. Review/modify financial statement structure version
- 4. Determine tax version
- 5. Define valuation area
- 6. Assign G/L accounts to financial statement version
- 7. Develop performance report with SAP Crystal Report
- 8. Perform daily financial transactions
- 9. Generate financial reports (balance sheet and profit and loss statement)
- 10. Generate financial reports with SAP Crystal Dashboard Design



### 4. Control Management

- 1. Review/modify/create your standard hierarchy for cost centers.
- 2. Review/modify/create cost center element, element groups
- 3. Review/modify/create statistical key figure
- 4. Create distribution cycle
- 5. Create assessment cycle
- 6. Post/repost expense
- 7. Run cycles
- 8. Display individual line items
- 9. Review actual line item reports

### 5. Procurement Management

- 1. Define purchase order tolerance
- 2. Define various tolerance limits
- 3. Create vendors
- 4. Create info records
- 5. Create source list
- 6. Create purchase requisition
- 7. Create purchase order
- 8. Release purchase order
- 9. Confirm goods receipt
- 10. Post invoice
- 11. Post payment
- 12. Check material availability
- 13. Check open purchase orders
- 14. Generate purchasing reports
- 15. Conduct purchase (activity and order) analysis

# 6. Production Management

- Create/modify/review work centers to match required capacity
- 2. Create/review/modify labor activity cost
- 3. Create production scheduler profile
- 4. Define control parameters for MRP
- 5. Define variation for goods receipt
- 6. Run MPS/MRP
- 7. Convert planned orders to production order
- 8. Check material availability
- 9. Release production order
- 10. Goods issue,
- 11. Completion of order



- 12. Goods receipt for finished goods
- 13. Order settlement
- 14. Generate production reports
- 15. Conduct production (activity and order) analysis.

# 7. Sales Management

- 1. Define distribution channels
- 2. Define sales divisions
- 3. Set up sales areas
- 4. Define loading groups
- 5. Create customers
- 6. Setup credit limit and discount for customers
- 7. Specify strategy for different customers and distribution channels.
- 8. Create sales quotation
- 9. Create sales order,
- 10. Create delivery notes
- 11. Picking/goods issue,
- 12. Bill customer
- 13. Post payment
- 14. Generate sales reports
- 15. Conduct sales (activity & order) analysis.

### 8. Human Resources

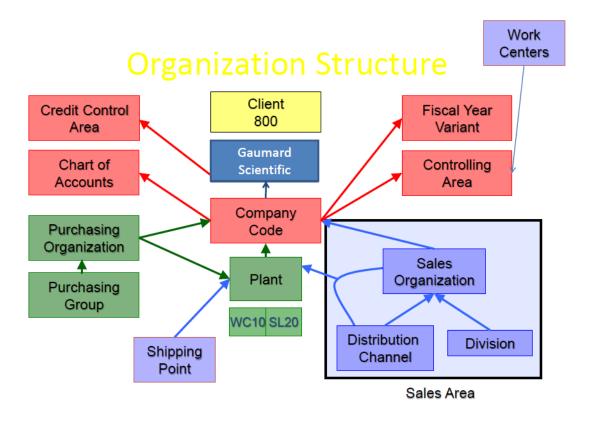
- 1. Review/modify organization plan
- 2. Create/modify a functional area within the org.
- 3. Create a new job
- 4. Create a new position
- 5. Advertisement
- 6. Receive and process applications
- 7. Update employee master data
- 8. Send employment to training



# 4. SAP Implementation

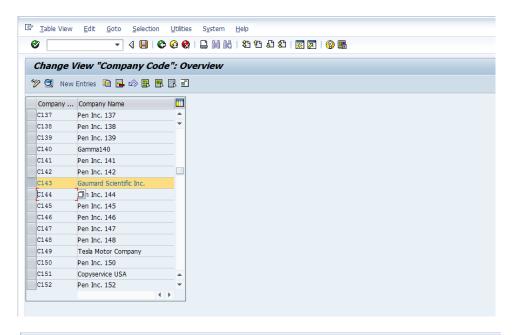
# 4.1 Business Implementation Plan

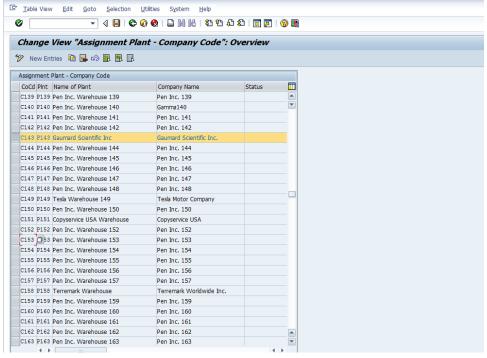
# **Company Organization Structure**





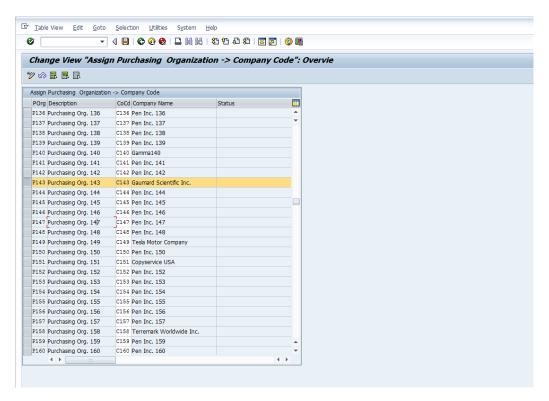
# **Company Code**





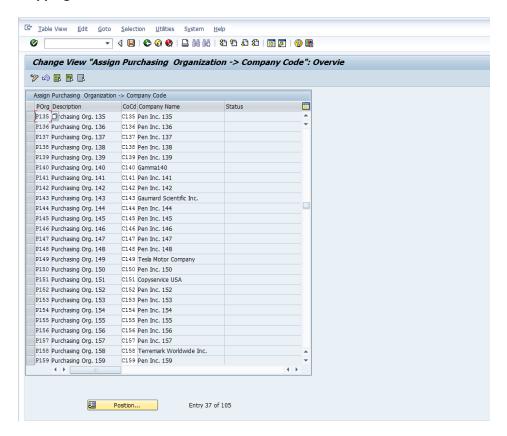


# Name of the Purchasing Organization

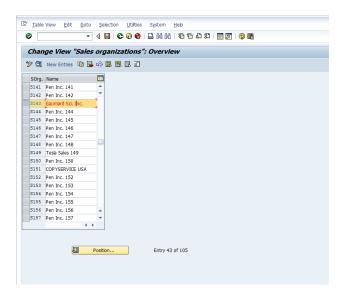




### **Shipping Point**



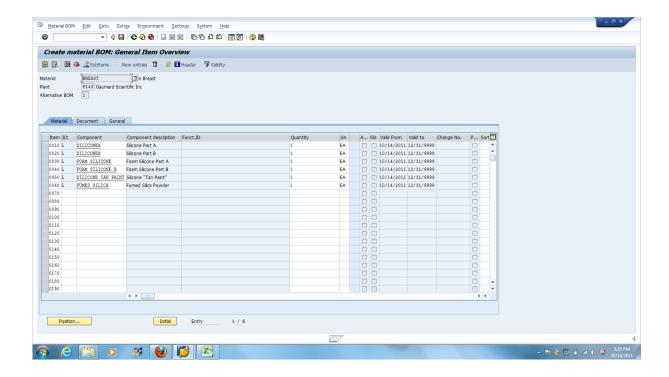
## **Sales Organization**



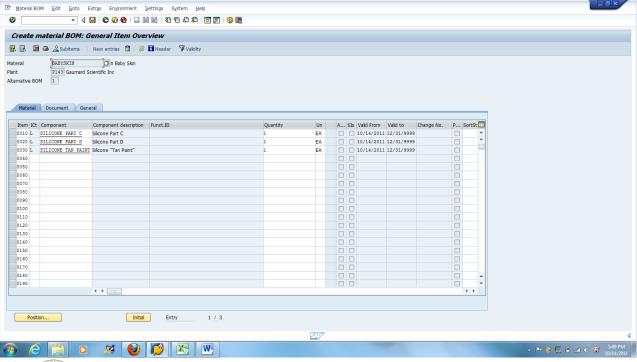


### **Operations Planning**

### **BOM for Tan Breast**

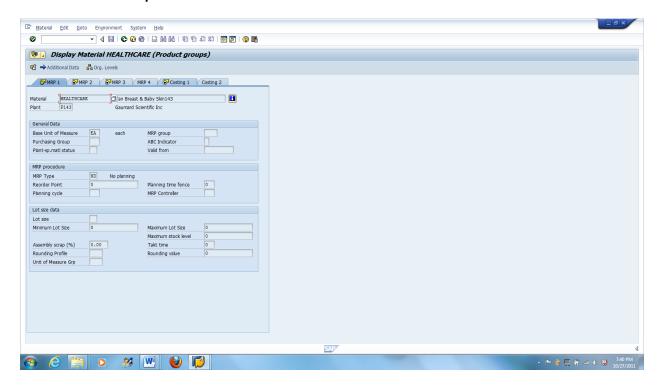


### **BOM for Tan Baby Skin**

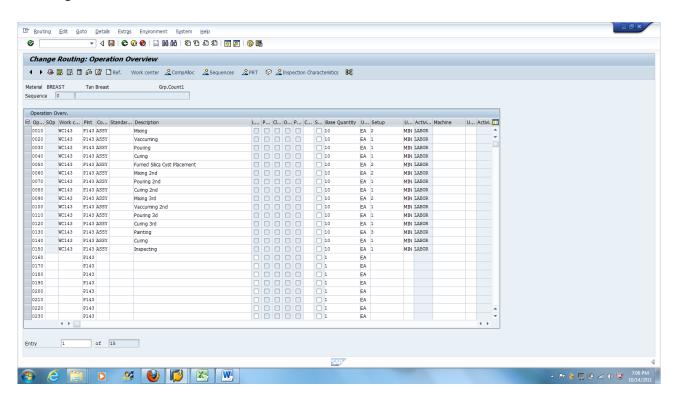




### **Create Product Groups**

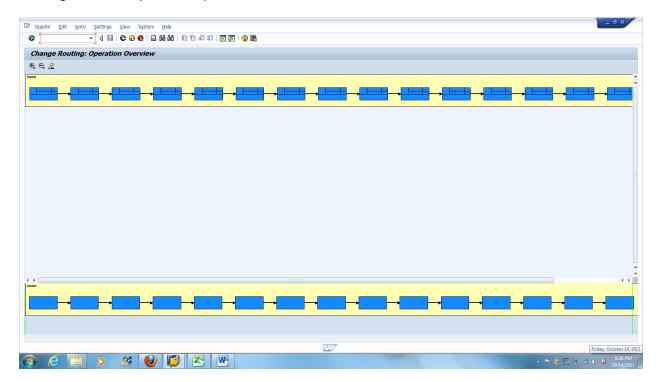


### **Routing List Tan Breast**

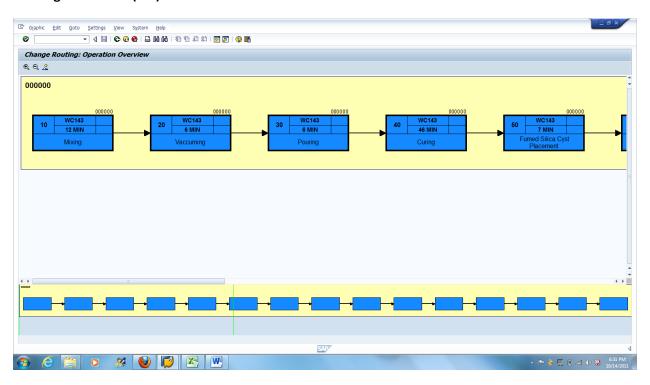




# **Routing Tan Breast (Zoom Out)**

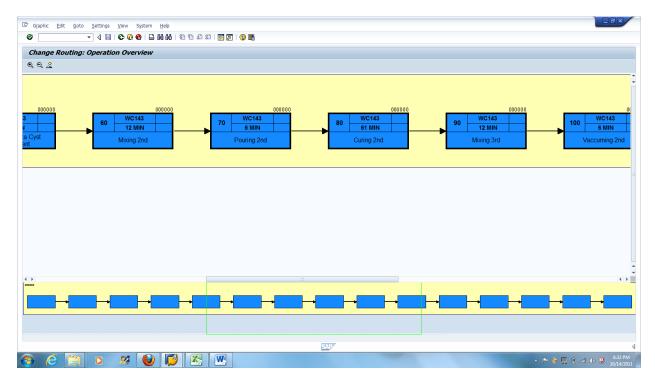


# Routing Tan Breast (1-5)

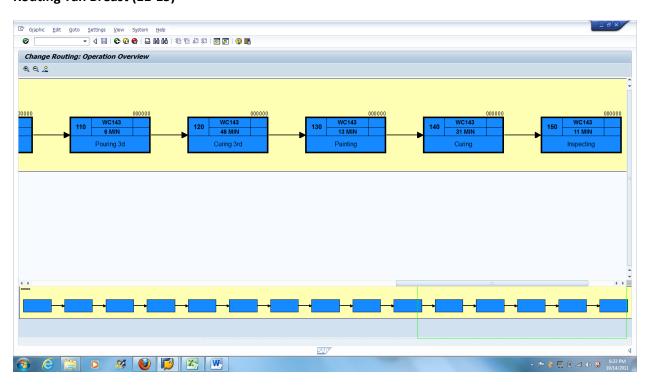




# Routing Tan Breast (6-10)



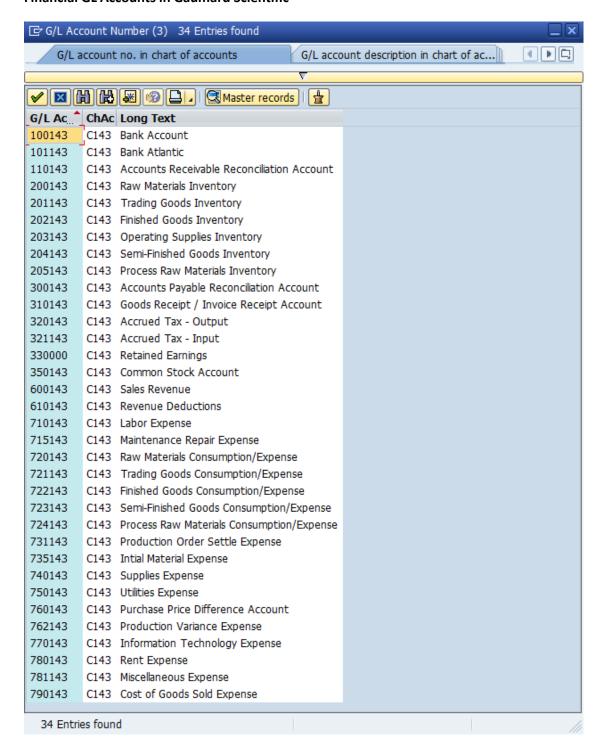
# Routing Tan Breast (11-15)





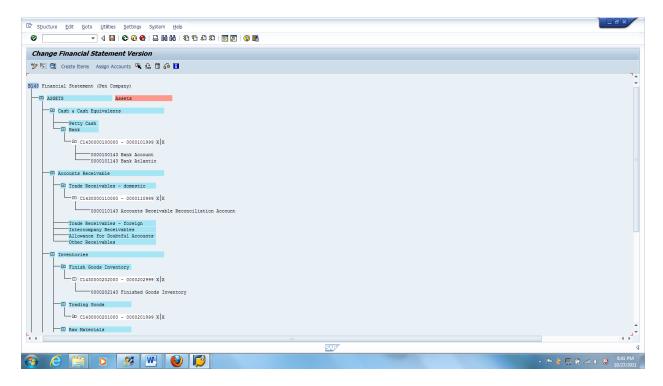
### **Financial Management**

#### Financial GL Accounts in Gaumard Scientific



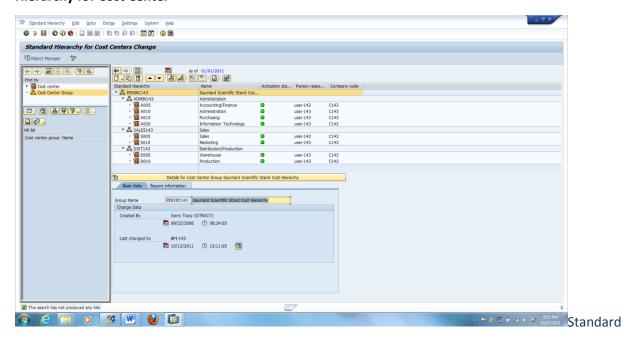


### **Review Financial Statement Structure**



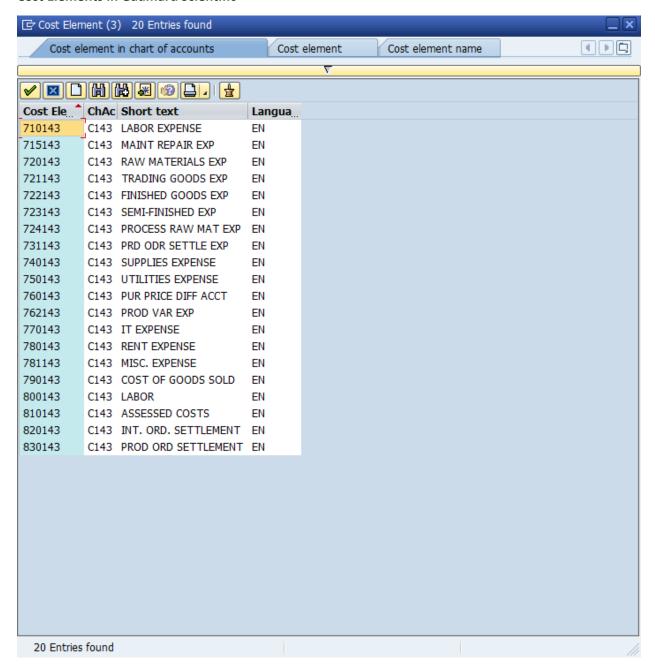
### **Control Management**

# **Hierarchy for Cost Center**



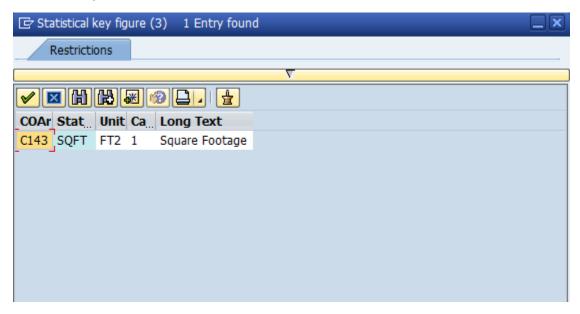


### **Cost Elements in Gaumard Scientific**

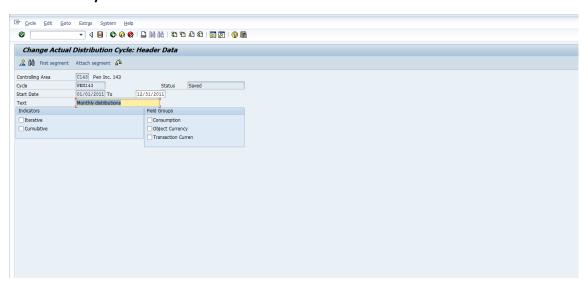




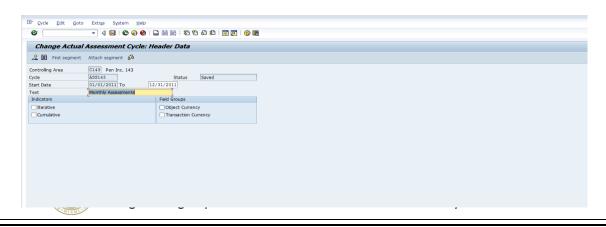
# **Statistical Key**



### **Distribution Cycle**

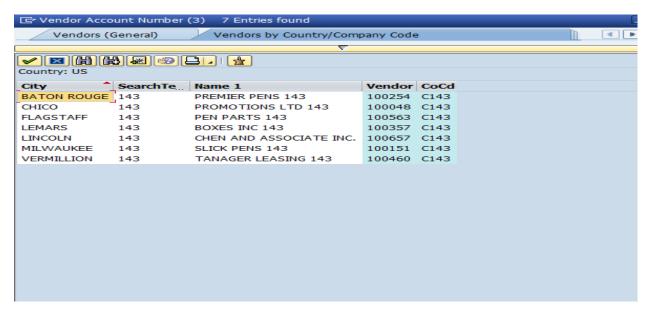


# **Change Assessment Cycle**



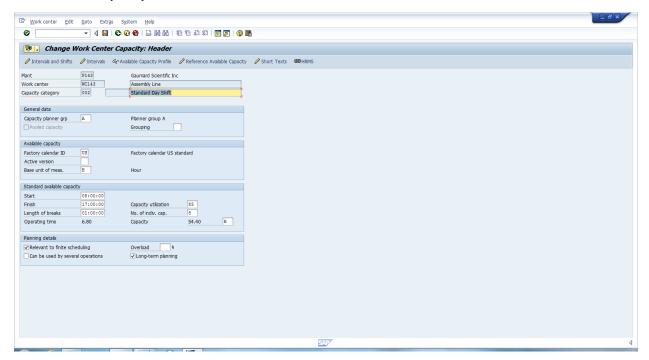
### **Procurement Management**

### **Vendors**



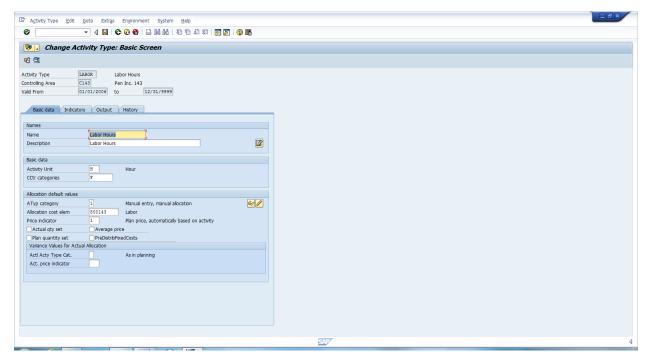
### **Production Management**

### **Work Center Capacity**

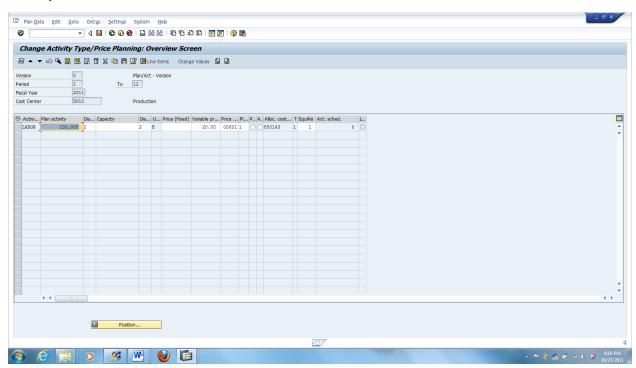




# **Activity Type**



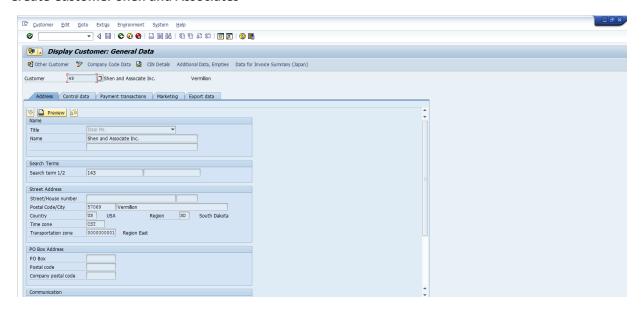
# **Activity Cost**



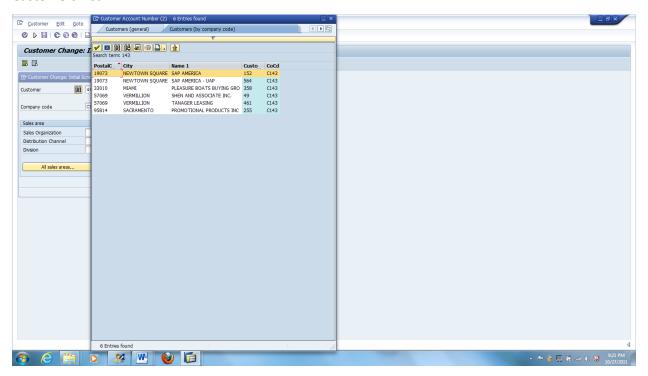


### **Sales Management**

### **Create Customer Shen and Associates**

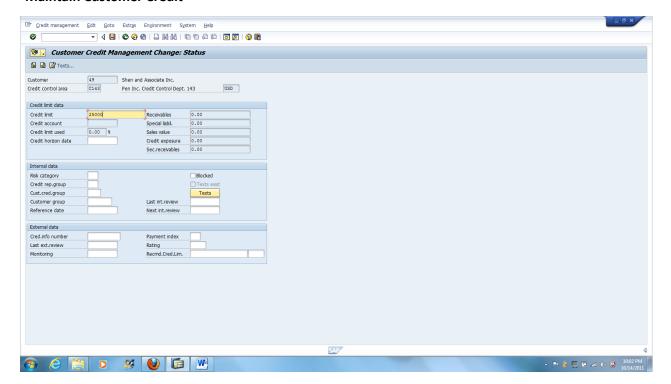


### **Customers List**



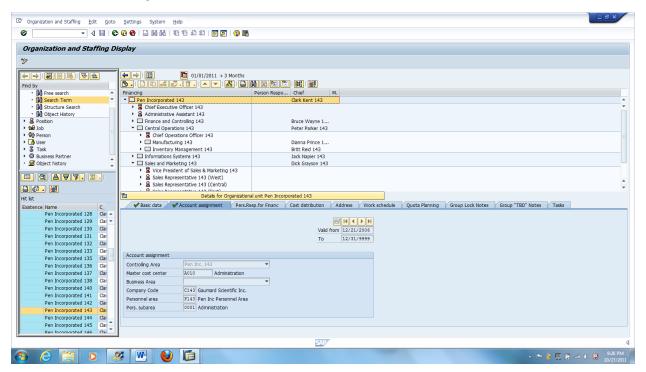


### **Maintain Customer Credit**



### **Human Resource Management**

# **Gaumard Scientific Organization**

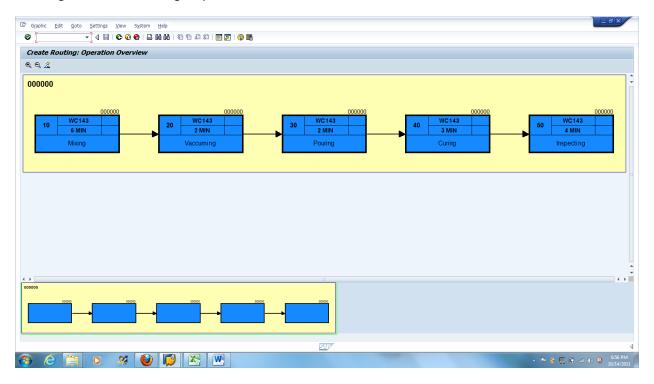


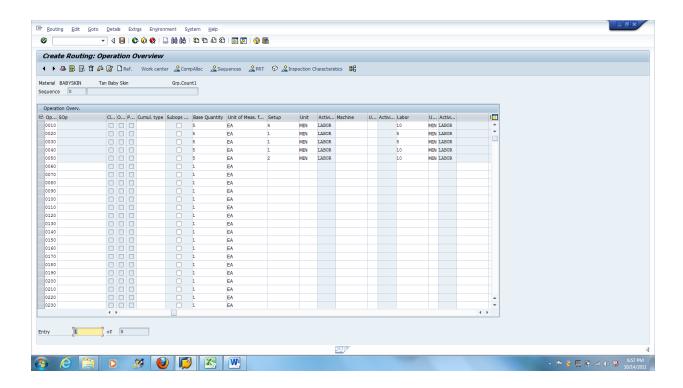


# **5 System Operations**

# **5.1 Operations Planning**

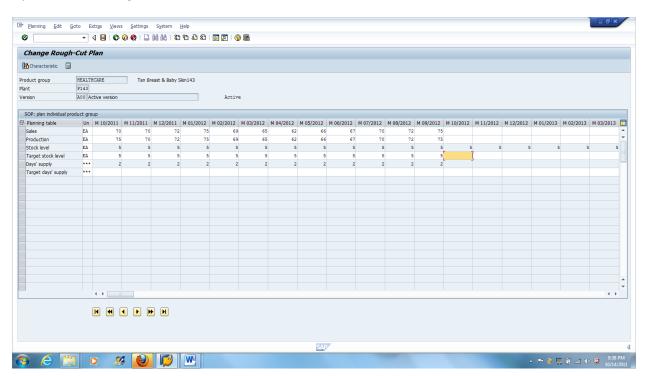
Routing was saved with group 50000260 and material BREAST



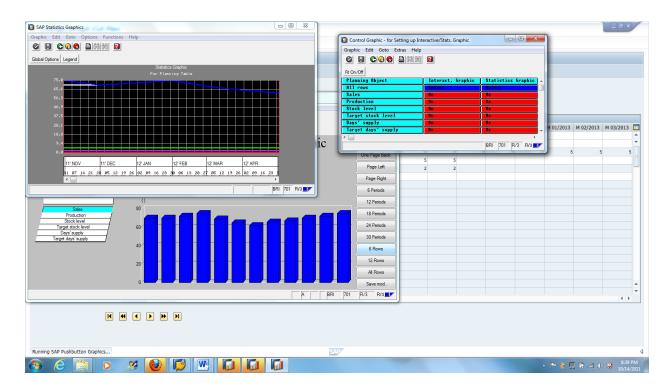


# Routing was saved with group 50000261 and material BABYSKIN.

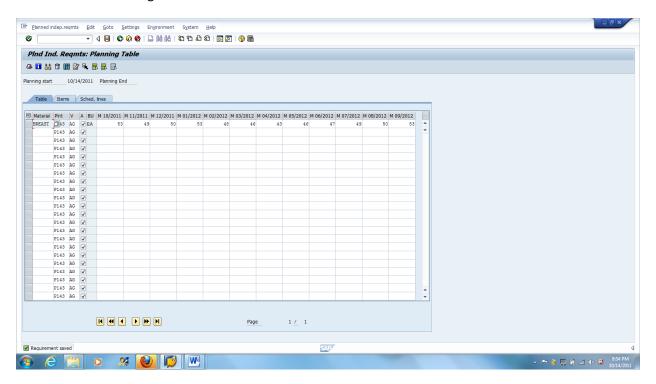
**Operations Planning and Demand** 



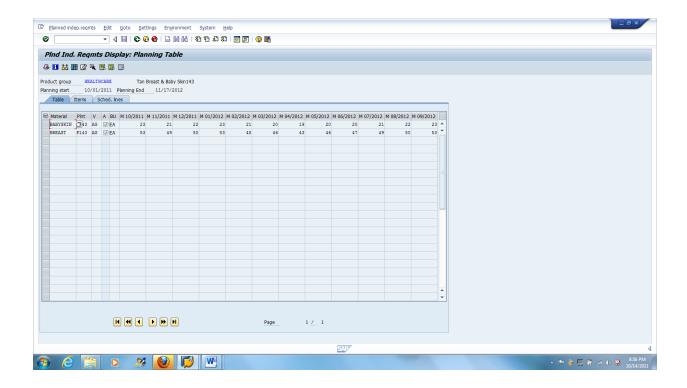




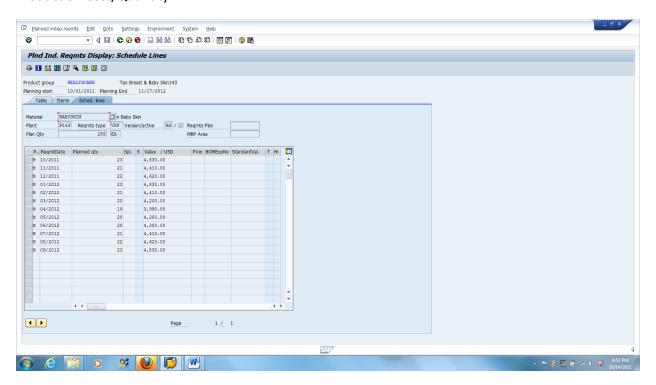
# SOP to Demand Management



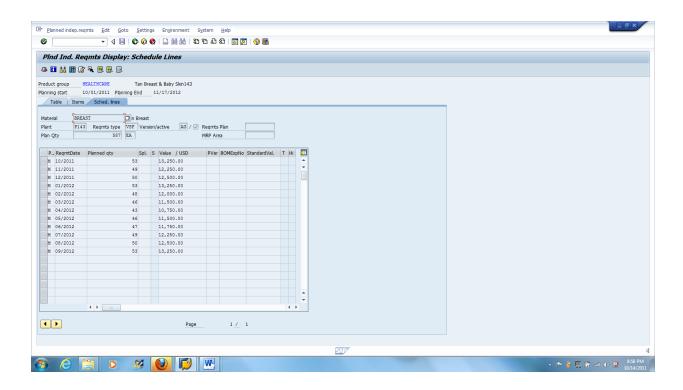




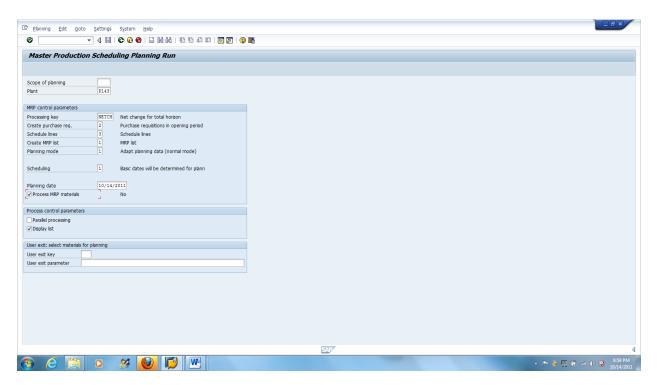
### **Production Cost/Quantity**



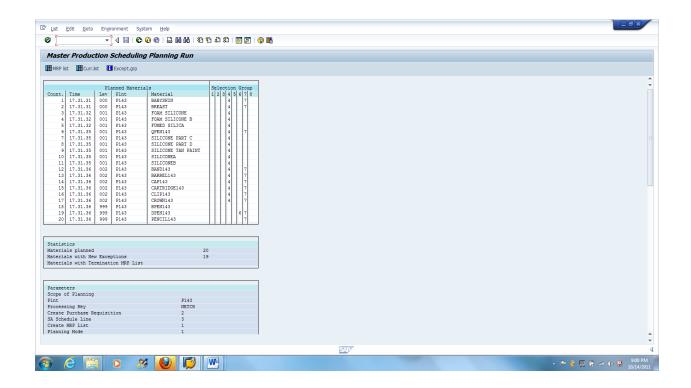




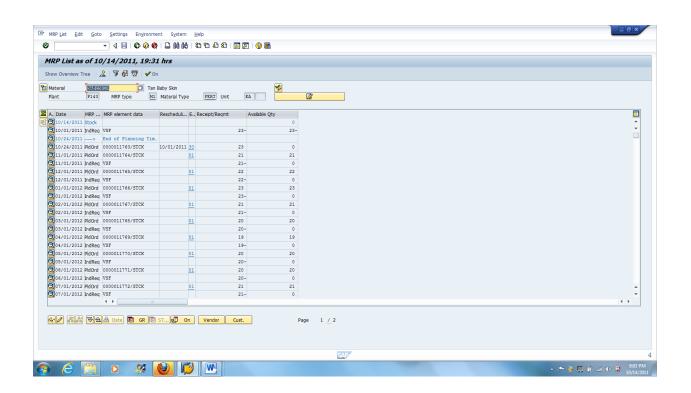
### **MRP**







### Itemized MRP List





# **5.2 Human Resources Operations**



Order yours today!!! Ctaru002@FIU.edu

# **Phantom Breast**

Regular NOW ONLY \$500.00 \$459.00\*

- Visualize cysts and masses using REAL ultrasound equipment
- Learn to do ultrasound guided needle aspiration in a relaxed environment before moving onto actual patients
- Left breast contains three cysts and six masses randomly placed in the breast and axilla
- Right breast contains ten cysts of different sizes and depths.
- Realistic texture and look
   Self-Healing skin
- Breasts easily removed and assembled
- Use in either the upright or reclining position
- Indiscernible masses and cysts prompt students to resort to ultrasound imaging
- Medium skin tone standard
- Light or dark skin tone optional at no extra cost
- Soft carrying bag
- User Guide, containing technical information on how to care for and maintain the simulator

\*When you order today.

FREE SHIPPING
WHEN YOU
MENTION THIS AD





# Gaumard®

Simulators for Health Care Education Introducing...

# Order yours today!!! Ctaru002@FIU.edu

# Preemie Hal Replacement Skin



\$600.00 \$549.00\*

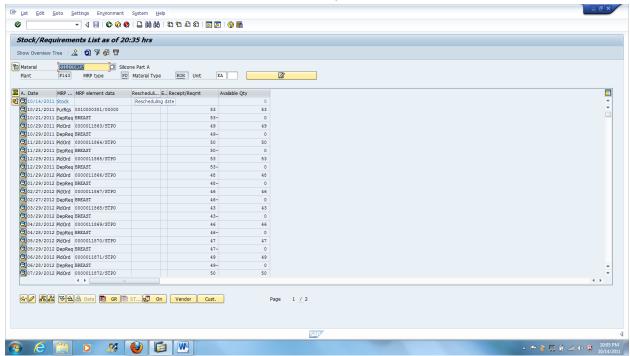
- > 28 week articulating PREMIE
- Realistic airway with tongue, vocal cords, trachea, and esophagus for airway management exercises
- Heart, lungs, airway and ribs
- Simulate "heel stick" maneuver for capillary blood sample
- BVM or CPR exercises
- Intubation plus suctioning
- Bilateral lung expansion with realistic chest rise
- View peripheral and central cyanosis as well as healthy skin tone
- Use monitor to select rates of improvement and deterioration
- Watch skin color change in response to the efforts of your student
- Pulse umbilicus using squeeze bulb
- Practice placement of umbilical lines
- Simulate CPR with either two-thumb "encircling" technique or two finger alternate compression method
- Practice delicate intraosseous access
- Practice injection and intravenous techniques

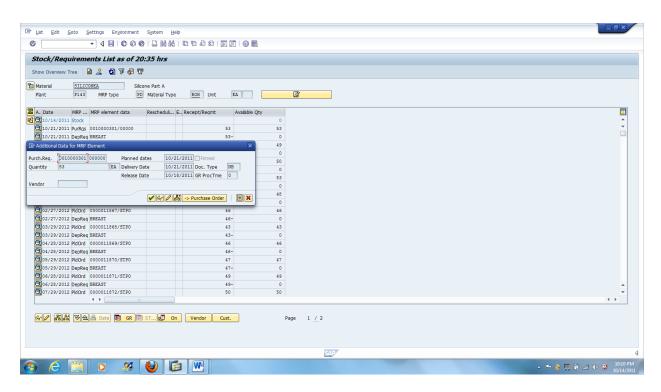
\*When you order today.



## **5.3 Procurement Operations**

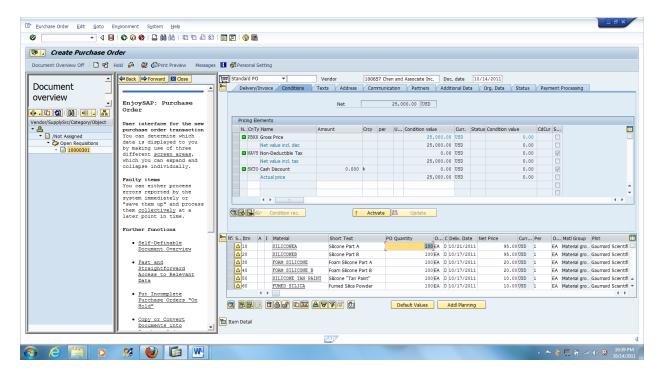
#### **Procurement Operations**







#### Create Purchase Order





#### Purchase order

Gaumard Scientific Inc. lincoln NE 68516

PO number/date 4500000034 / 10/14/2011 Contact person/Telephone User-159/605-555-1414

Your vendor number with us 100635

Please deliver to: Pen Inc. Warehouse 159 Student 159 123 Glen Avenue Vermillion SD 57069

Delivery date: Day 11/11/2011

Terms of payment: Payable immediately Due net

Currency USD

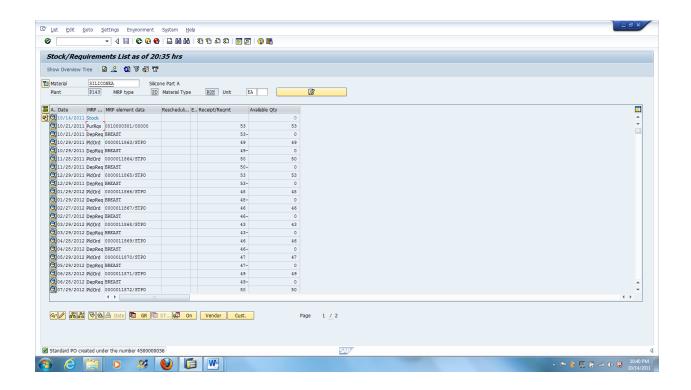
Item Material Order qty.	Unit	Description	n Price per unit	Net value
00010 BREAST159	50 each	Breast 159	450.00	22,500.00

Total net value excl. tax USD

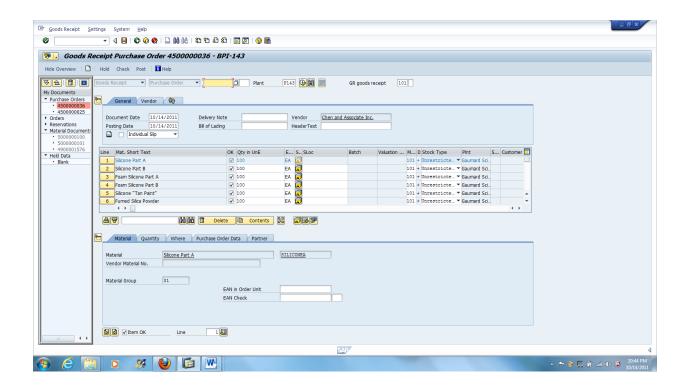
22,500.00

procurement Director:
Orship 10/14/2011



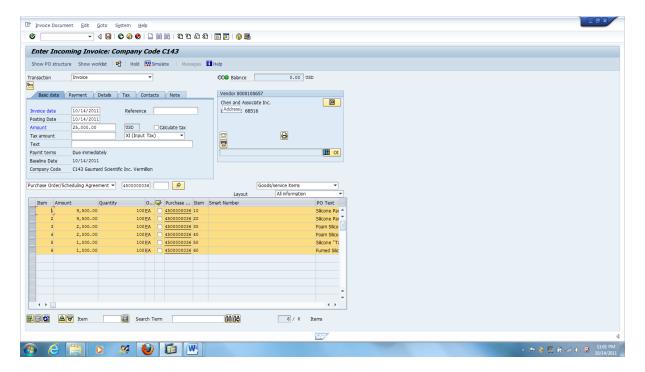


#### Goods Receipt for PO 4500000036



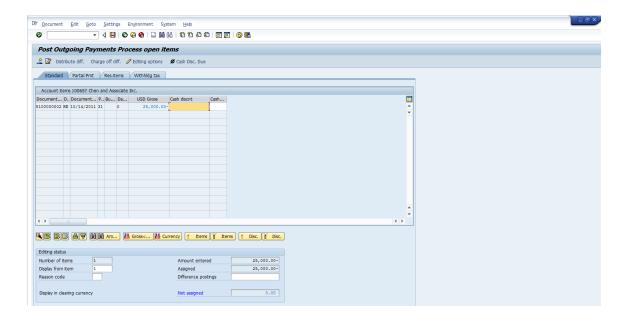


#### Invoice



#### Document no. 5105600827 created

Post Payment to the vendor



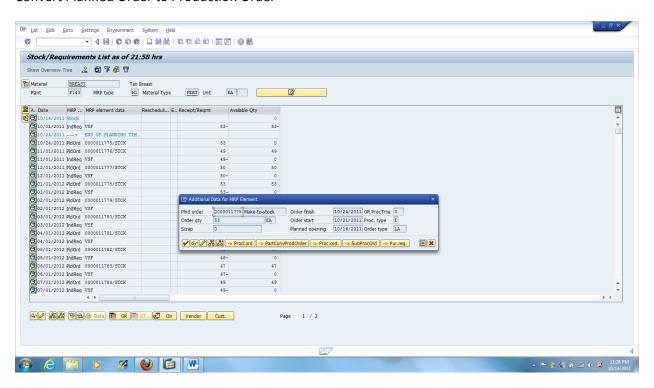
Document 1500000002 was posted in company code C143



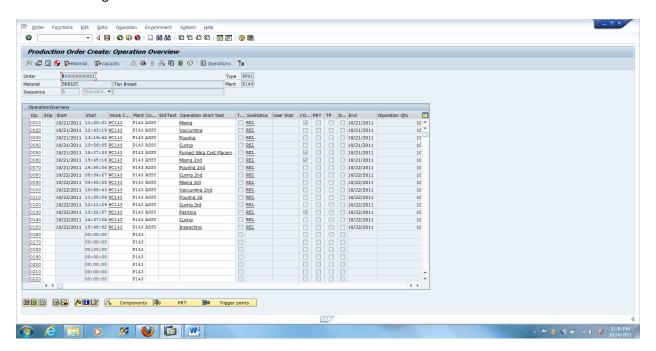
# **5.3 Production Operations**

#### Production

Convert Planned Order to Production Order

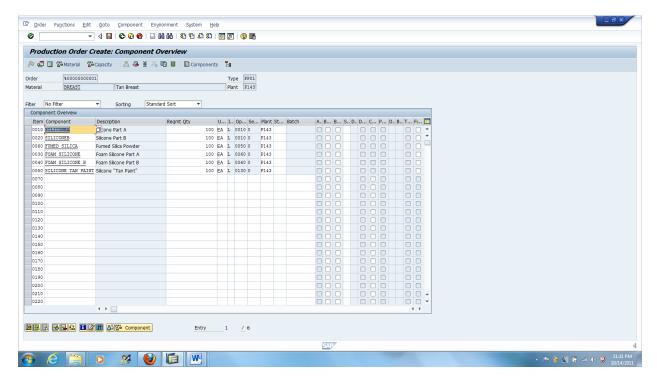


#### **Review Routing for Production Order**

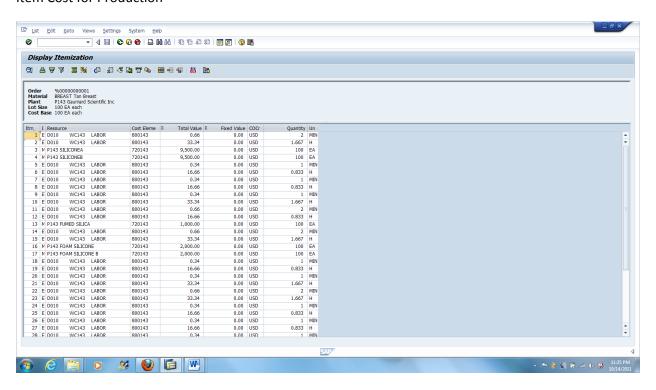




#### Components requirements for this Production Order



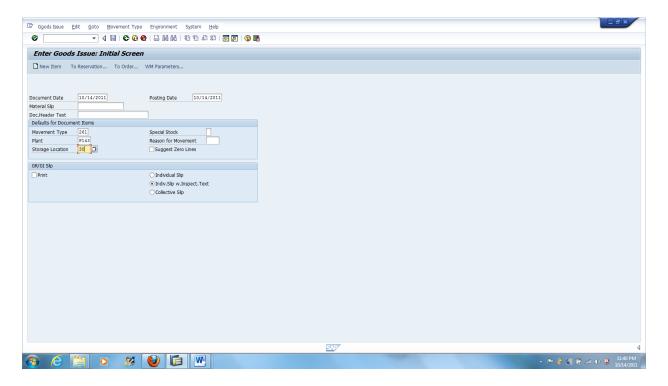
#### **Item Cost for Production**



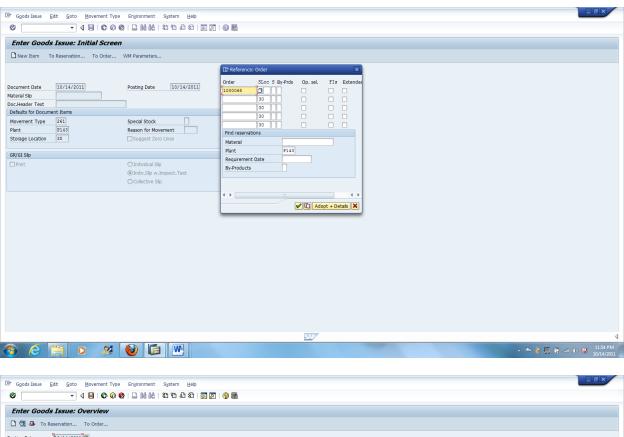


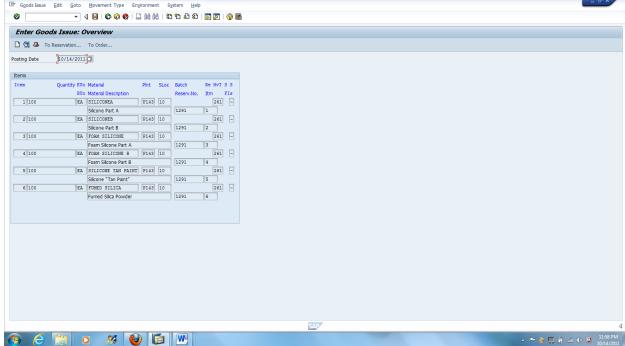


#### Goods Issue for Production Order



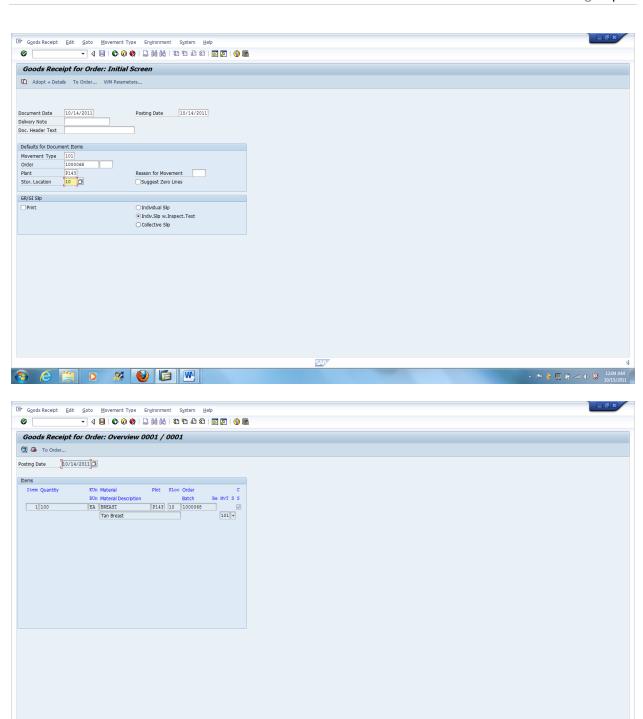




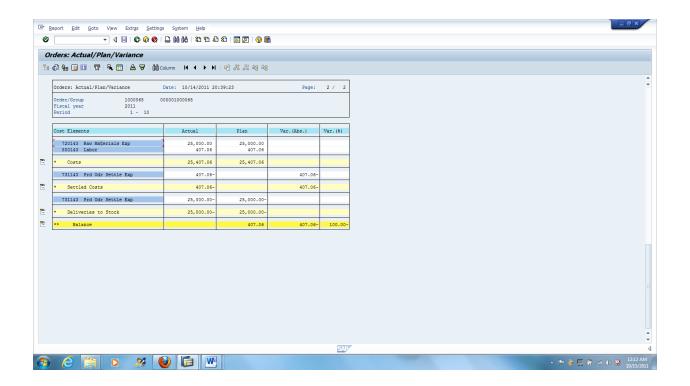


Goods Receipts for Finished Goods of the Production order





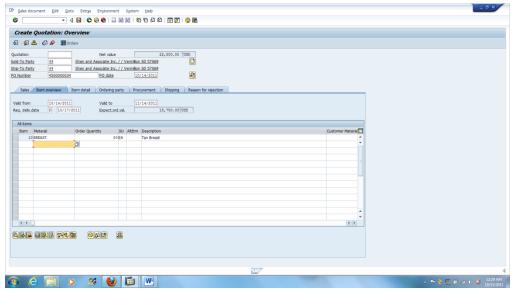




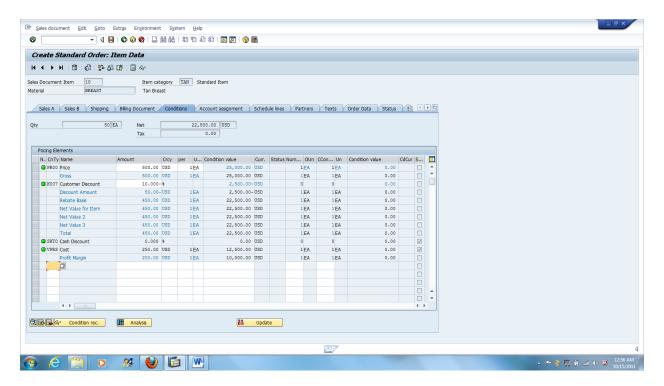
# **5.4 Sales Operations**

#### **Sales Operation**

#### **Create Quotation**

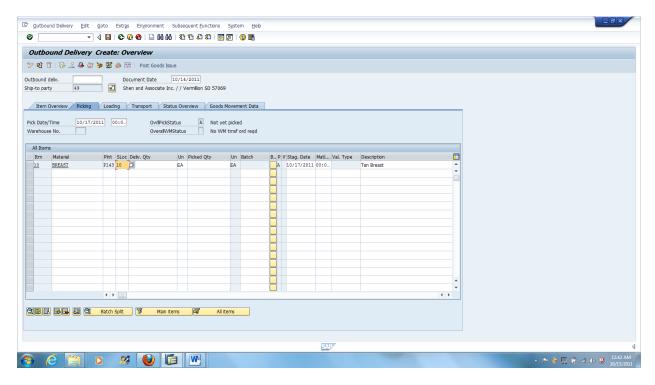


#### Create Sales Order

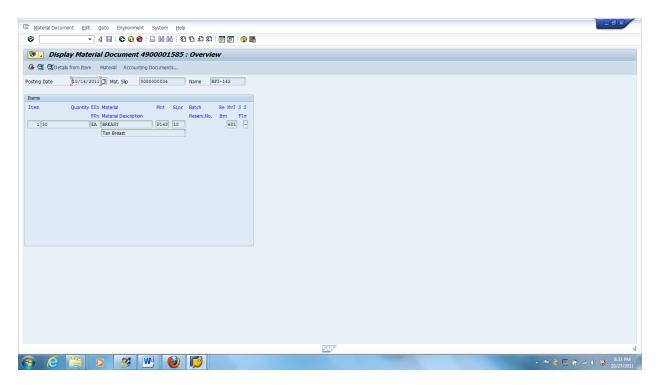




#### **Outbound Delivery**

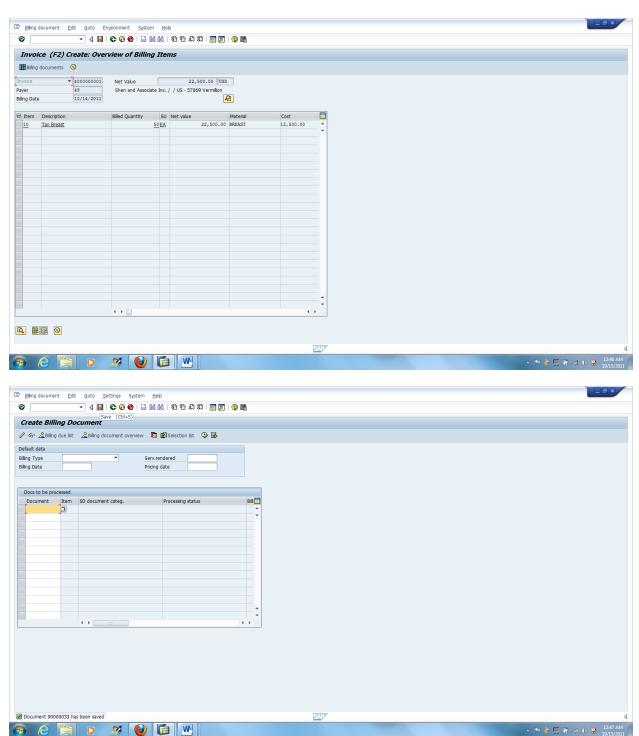


#### Goods Issue





#### **Bill Customer**





#### **Invoice to Customer**



#### IDES Holding AG, Postfach 16 05 29, D-60070 Frankfurt/M

Dear Mr. Shen and Associate Inc. VERMILLION SD 57069 USA



# Invoice

Repeat Print

Payment Information Doc. No./Date Delivery Note No./Date

Order No./Date Reference No./Date Customer

Currency Invoice Amount 90000033/ 10/14/2011 80000034/ 10/14/2011 37/ 10/14/2011

4500000034/ 10/14/2011 49 USD

22,500.00

Conditions

Payment

Up to 10/14/2011 without deduction

Weight - Volume Gross Weight Net Weight

150 KG 150 KG

Delivery

FOB

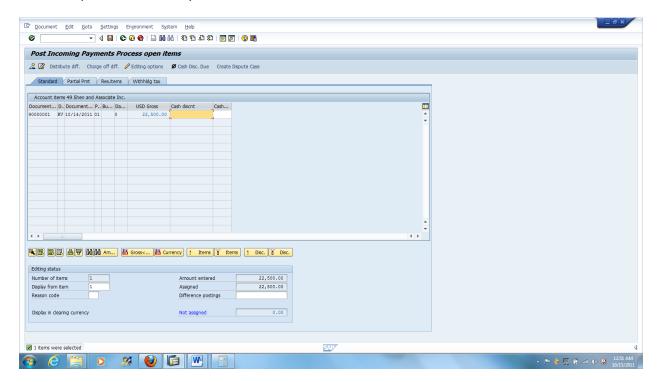
Origin Shipping Dock

Invoice Details

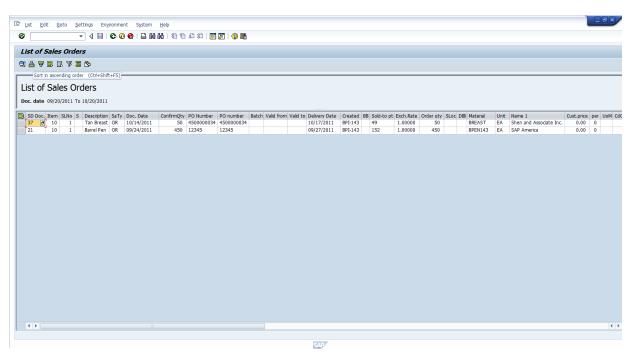
Item	Material Description	Quantity		
	Pricing Conditions	Price	Price Unit	Value
000010	BREAST	50 EA		
	Tan Breast			
	Gross	500.00 USD	1 EA	25,000.00
	Customer Discount	10.00- %		2,500.00-
	Net Value for item	450.00 USD	1 EA	22,500.00
	Invoice Amount			22,500.00
	Amount Eligible for Cash			22,500.00



#### Post Receipt of Customer Payment

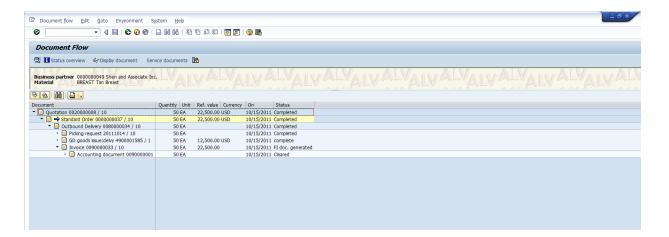


### Document 1400000001 was posted in company code C143





#### **Document Flow**

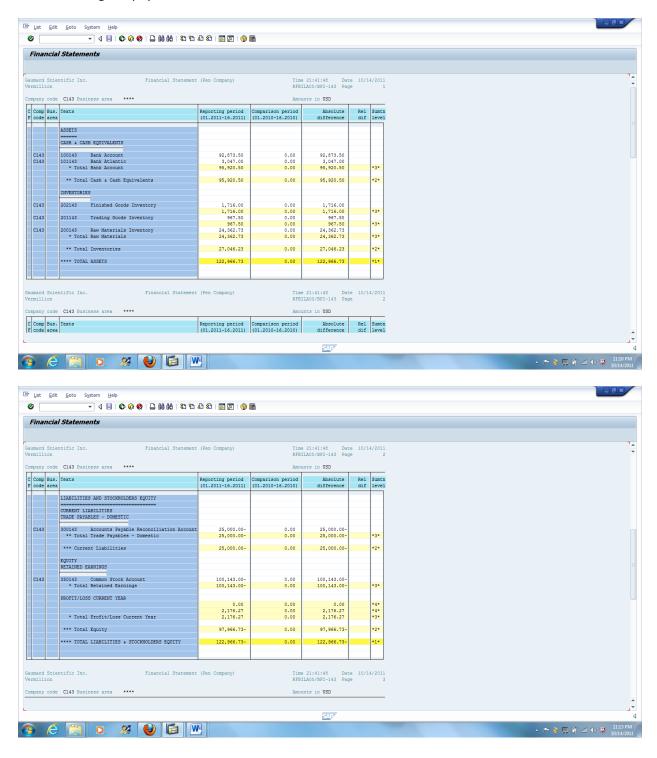




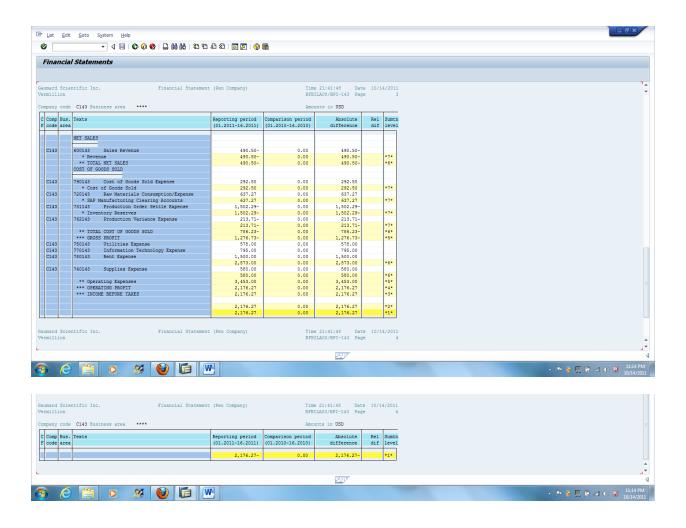
# **5.5 Financial Management Operations**

**Financial Management Operations** 

Before Posting the payment to the vendor

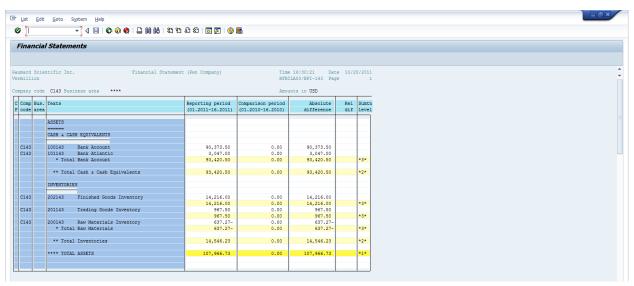






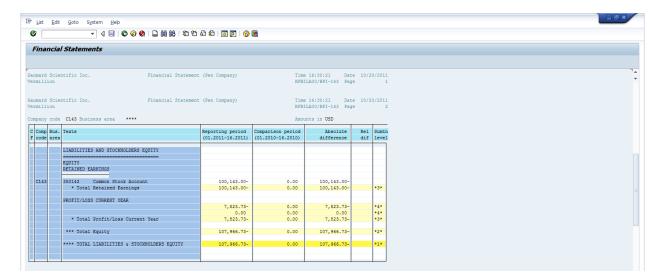
#### Financial Statements after PO Posted

#### Balance Sheet - P1

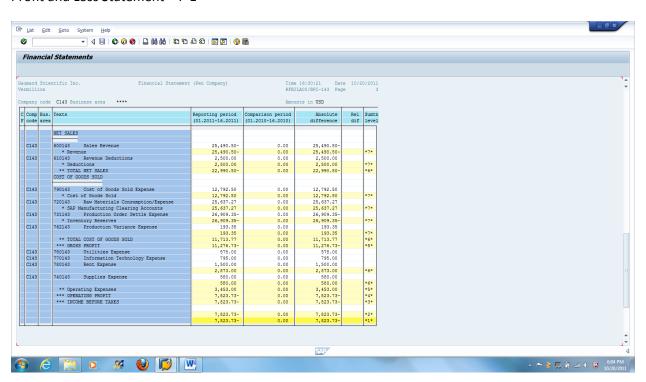




#### Balance Sheet - P2



#### Profit and Loss Statement - P 1



#### Profit and Loss Statement - P2





## **6 SAP Crystal Dashboard Design**









