Seventh Annual National Conference on Enterprise Computing 2015 Marist College

Creating Learning Experiences for Undergraduate Students to Better Understand Production Management, Master Production Scheduling with the ERP Tool used at Farmingdale State College.

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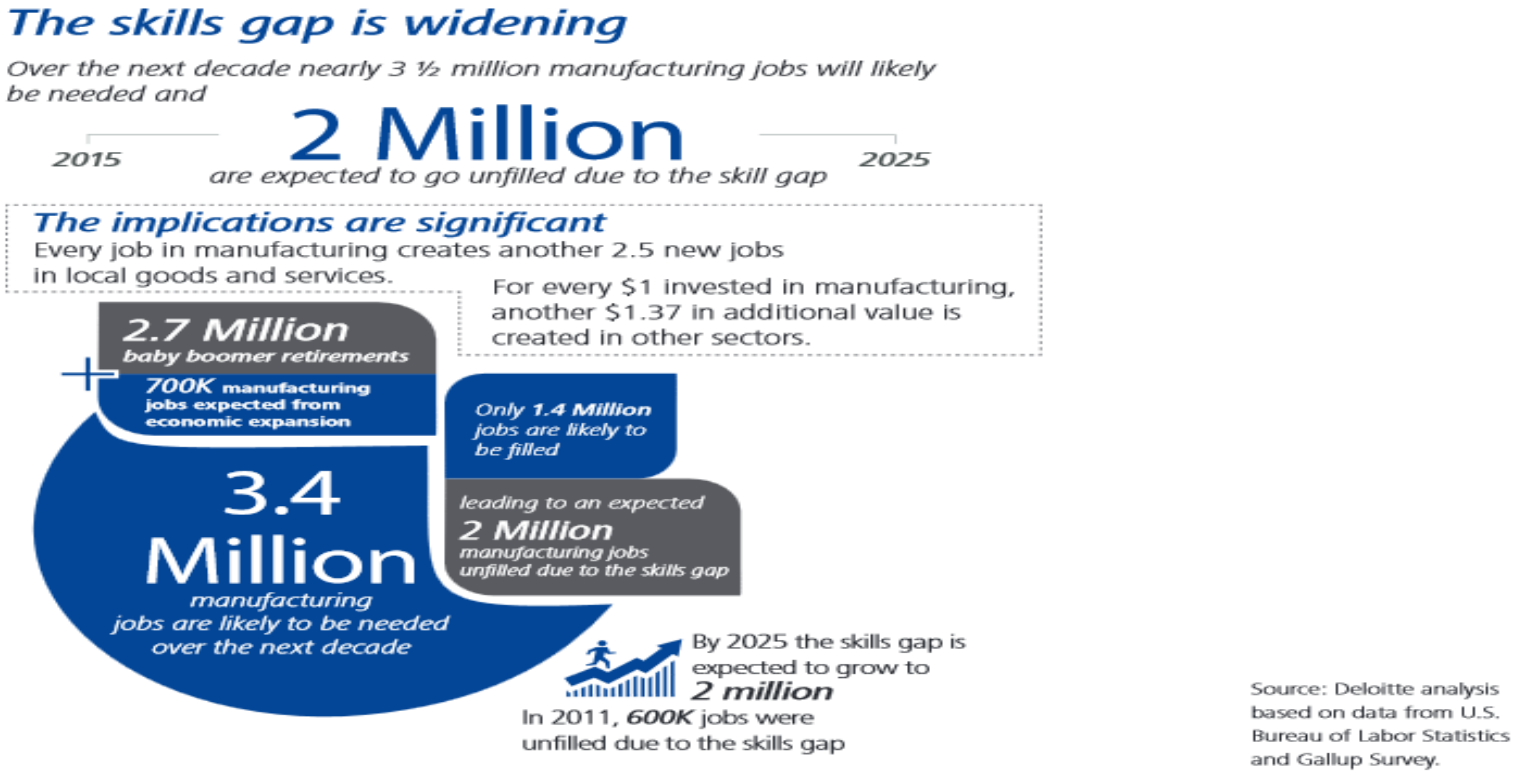
DRIVING EDUCATION FORWARD
SYNERGY
VISUAL ERP UNIVERSITY

We need to address the **skills shortage**

encountered in large, small and medium size manufacturers, distributors and service providers



Need in academia to **effectively teach** ERP concepts

- using a hands-on, real world ERP software tool in the classroom, that **reflects what is used by employers** during their ERP training and business use.

Need for employees with these ERP skills

- just as we see many **skills lacking** in machining, programing, we see the lack of cross functional knowledge in the effective use of an enterprise system.

As technology becomes more advanced in industry

- the need for a **better trained** and **prepared workforce** becomes more critical to building a sustainable talent pipeline.

Industry speaks

- In a recent survey, 30 percent of companies said **finding the right applicant** has grown harder in the past few years.

Manufacturing is playing a significant role in its re-shoring into America.

- Companies are grappling with ways to distinguish themselves through their intellectual capabilities, process improvements, information technology, **people**, and shop floor management tools.

The flow of accurate information within a manufacturing company

- enables that company to **successfully** transform the inputs (raw materials) into outputs (finished goods) that *customer's value*.

- Just as important are the **people** they need to do that!

Skills gap

- There is a current **skills gap** in employee's knowledge of ERP systems that prohibit companies from operational excellence.

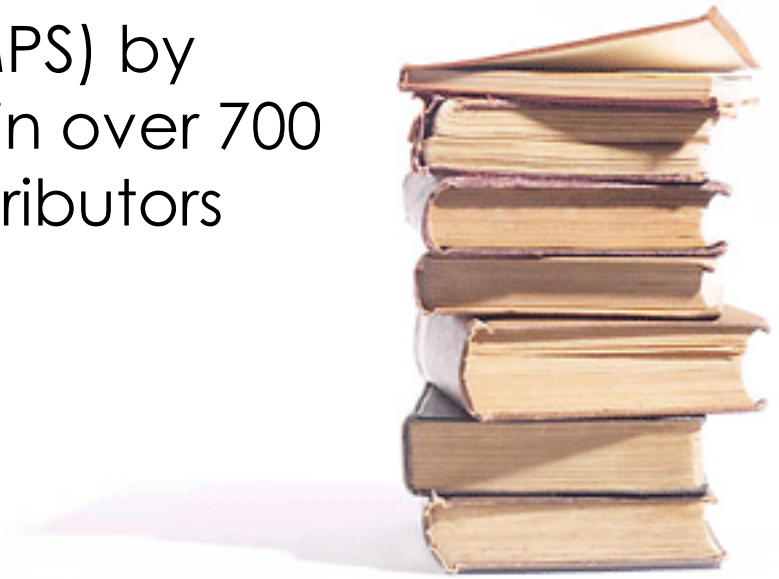
Skills in which manufacturing workers are most deficient

Note: Percentage indicates the percentage of executives who did not opt for "Extremley sufficient" or "Sufficient"

Source: Deloitte -The Skills Gap in U.S. Manufacturing 2015 and Beyond

Our purpose is to describe the effort at **Farmingdale State College** :

- to educate our students in understanding **Production Management** and **Master Production Schedule** (MPS) by using an ERP tool, used in over 700 local manufacturer, distributors and service providers.



Creating the Environment

- The "hands on" ERP learning environment was facilitated by a gift of ERP software licenses from Infor Global Solutions

- The courses were then developed by Farmingdale State College and Synergy Resources. Synergy Resources helps manufacturers improve their organizations and their productivity

Students **learn** from companies SME's how they perform their functions using this tool on the job .

- Estimating
- Engineering
- Order Entry
- Purchasing
- Inventory Control
- Work Orders
- Shipping
- Billing

This **learning** is complimented with

- touring local manufacturers who use this tool and having production control experts using this tool come into our classrooms.

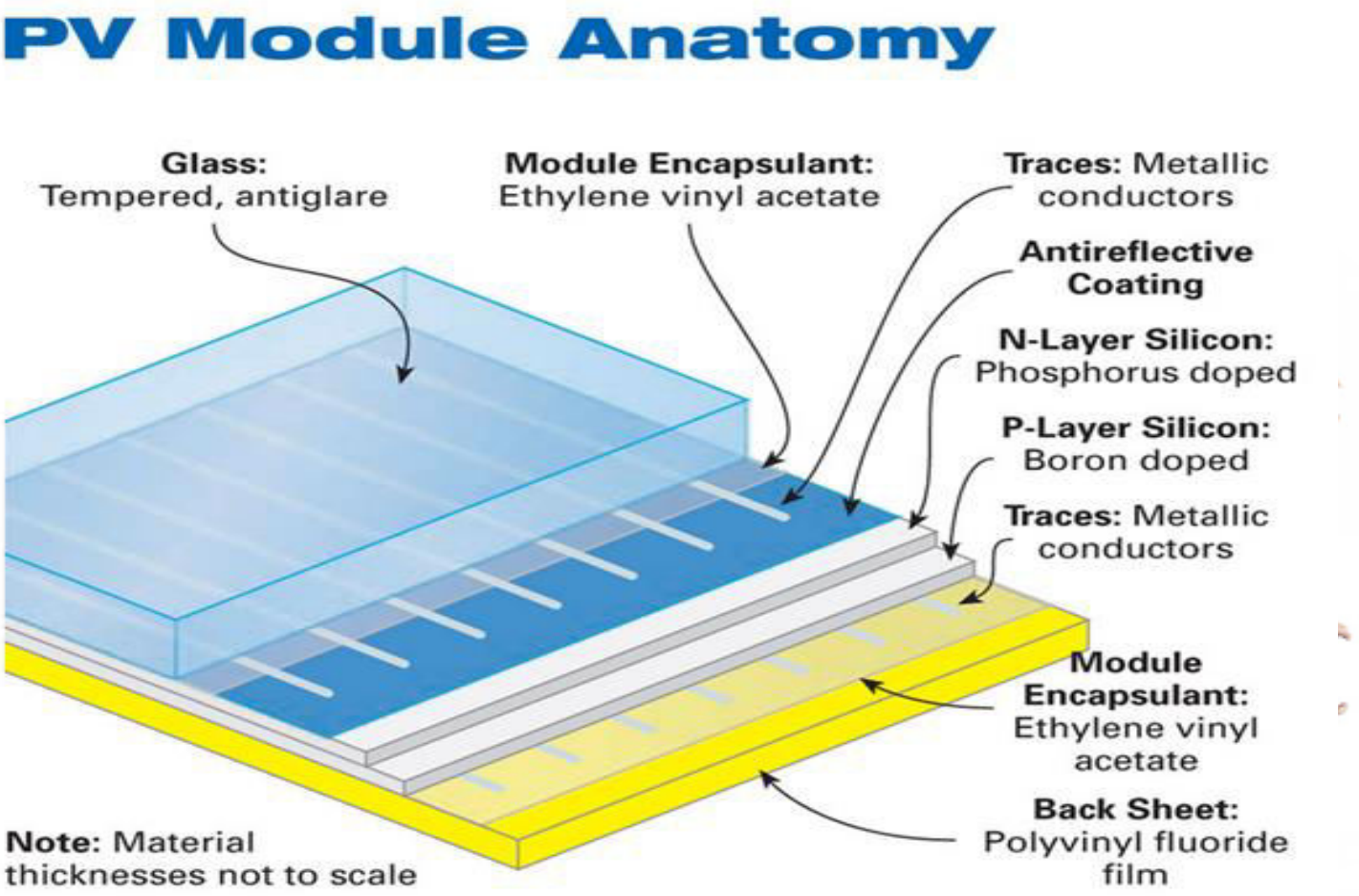
Company Visits

- Students see these exact screens at local manufacturers during the information sessions at these company's before the walking tours.

Creating Learning Experiences

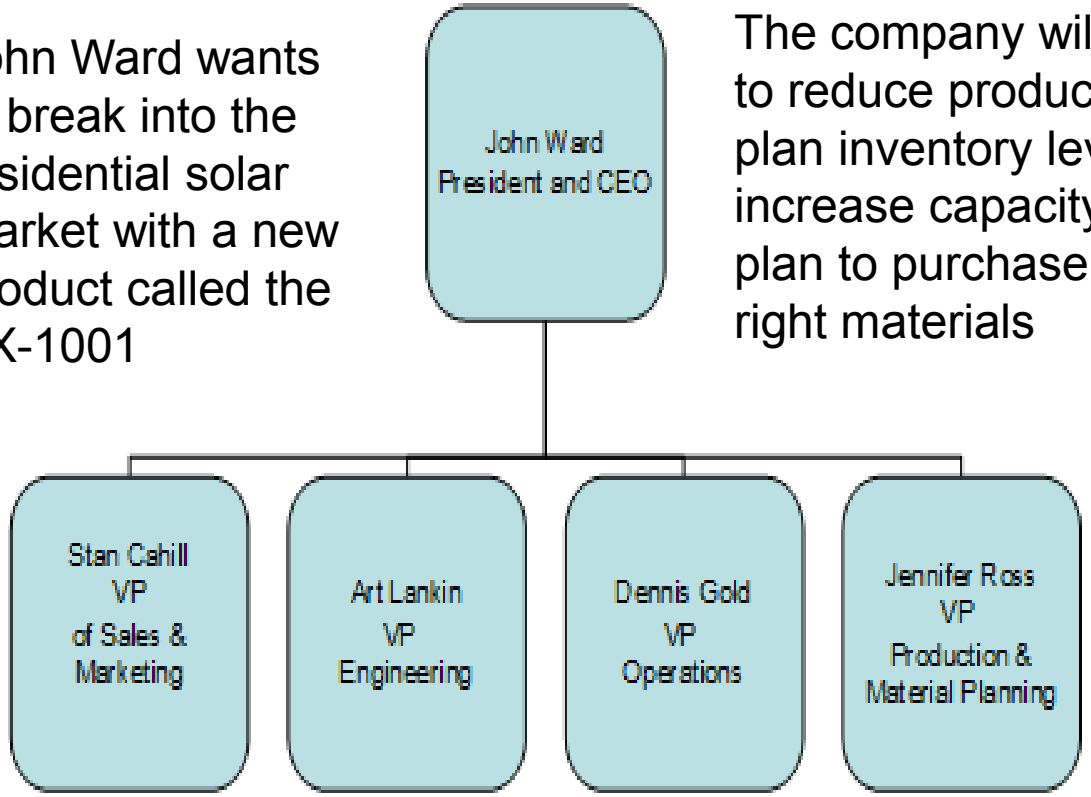
- Students are introduced to a company that manufactures Solar Collectors
- Students **identify** the desired schedule (forecast) and populate a Master Production Schedule.
- They **create** a BOM with work orders adding operations and material.

A Solar Collector is built using ERP



Students meet the staff of the Superior Solar Company and their Goals

John Ward wants to break into the residential solar market with a new product called the SX-1001



The company will need to reduce product costs, plan inventory levels, increase capacity and plan to purchase the right materials

All manufacturing companies that produce products

must define in detail;

- **how** a product is made,
- **what** materials are used,
- and what it **should look like** when it is completed

Students learning how to use an ERP tool

- need to understand this entire process which is called "Product Management".

(APICS) planning, scheduling, execution, and control of the process of converting inputs into finished goods

Differs in complexity from company to company

- students learn fundamentals that are typically:
- critical dimensions of the product **"Assembly"** drawing
- List of materials; Bill of Material or **BOM.**
- list of steps; **Operations Sheet**
- Together they create a structure called a "Bill of Manufacture"

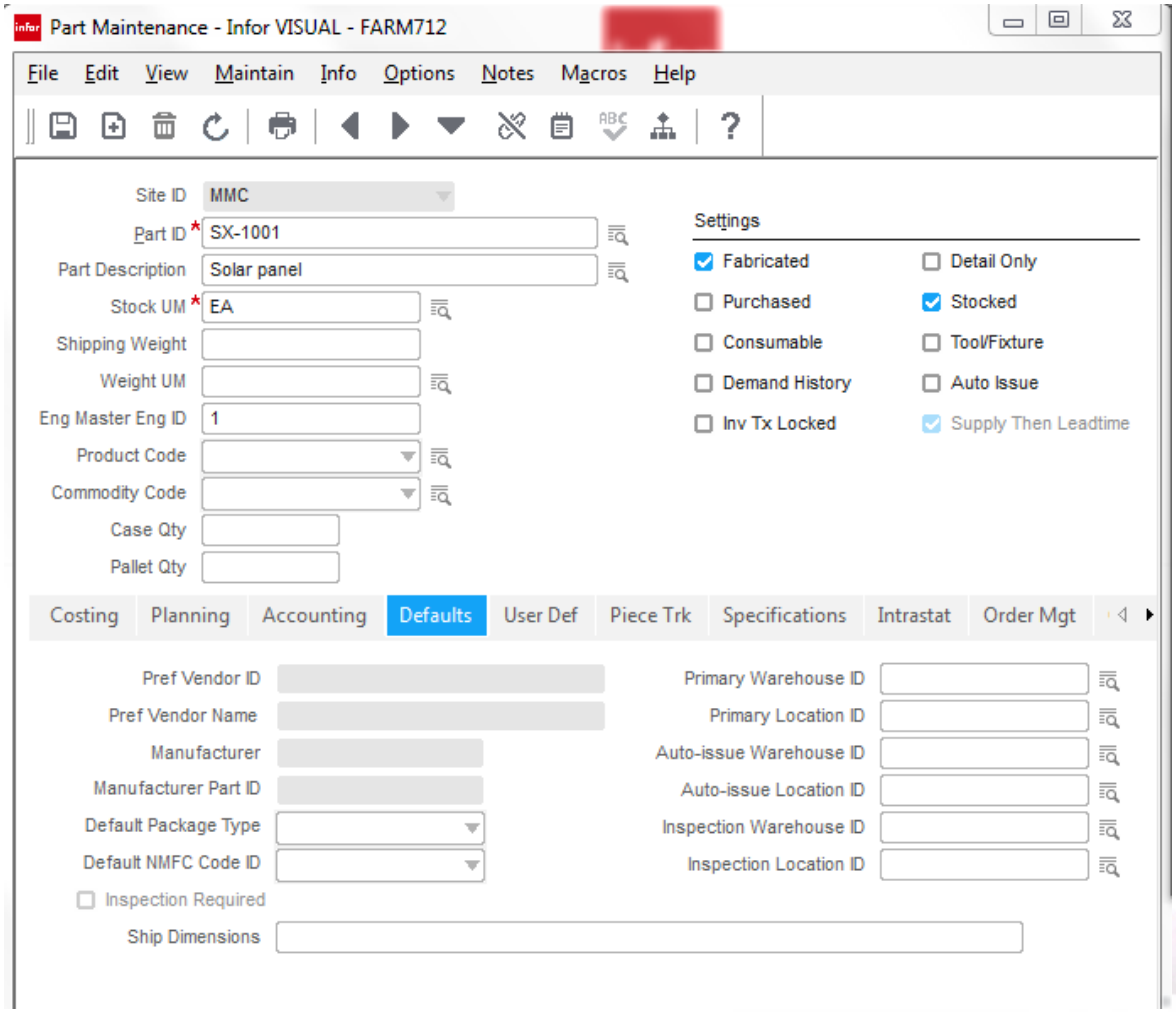
Students learn that every ERP system has a module that allows Designers and Engineers to store the information

- This module is a series of tables that store the materials needed for a part **(BOM)**, **(Operation Sheet**), the **Quality** information and all **Drawings** that may be required.

The information that is stored in these tables are then used

- to create "**Work Orders**" when the Planning Department decides that it is time to build a part to meet demand.

Students Enter Parts into the system

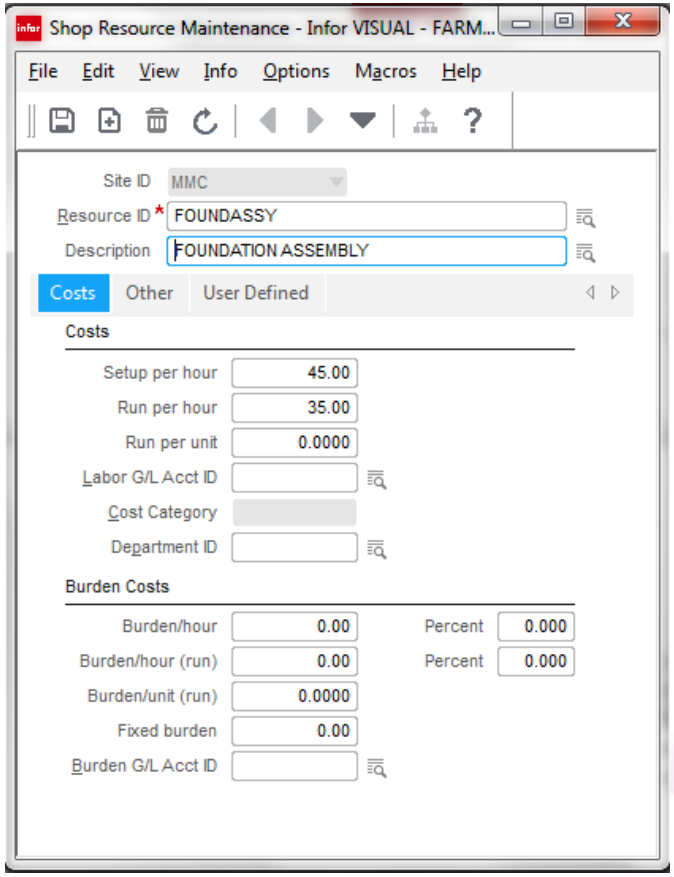


The ERP system allows **students** to enter information about a product by using three primary areas:

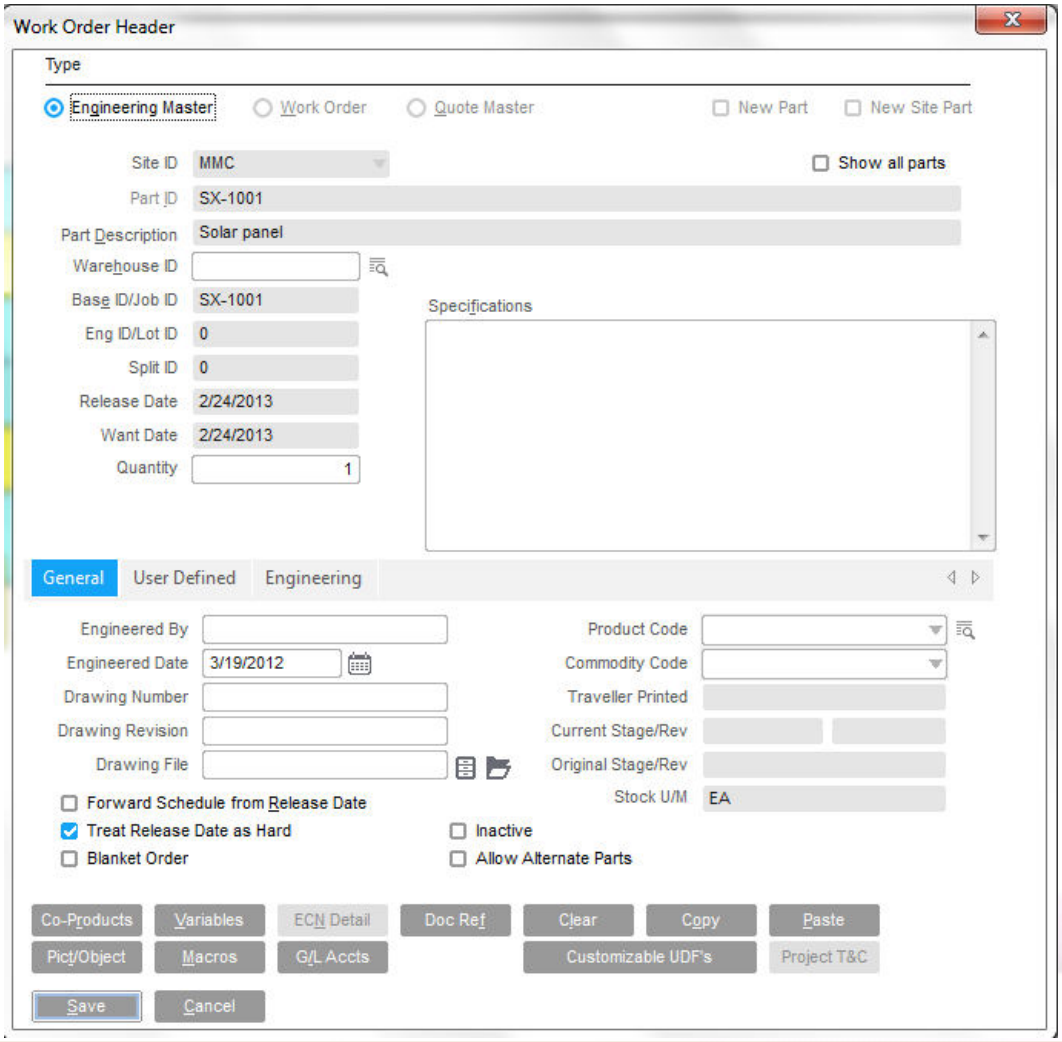
- **Shop Resources** – this table allows us to define the resource areas that we will need.
- **Part Maintenance** – as seen in earlier chapters, this table will contain the parts that are needed to produce the solar panel.
- **Manufacturing Window -** allows us to associate operations and material to develop a product structure

Shop Resources in Shop Resource Maintenance

Students Entering Data into the ERP System

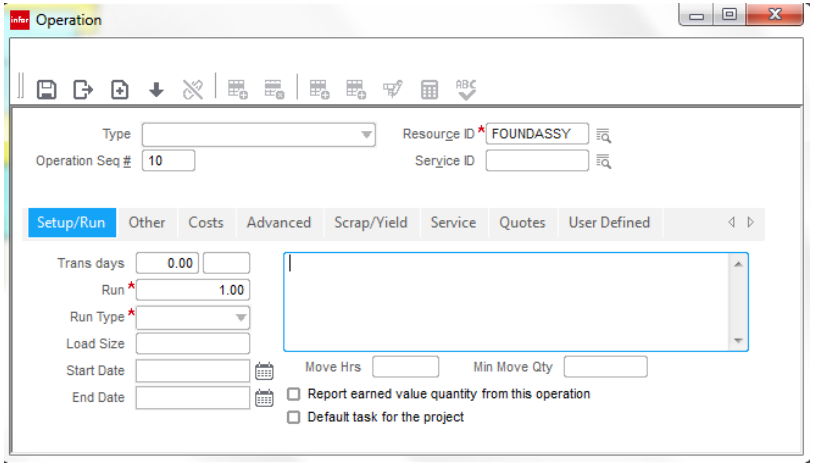


Making an Engineering master



When students build the product:

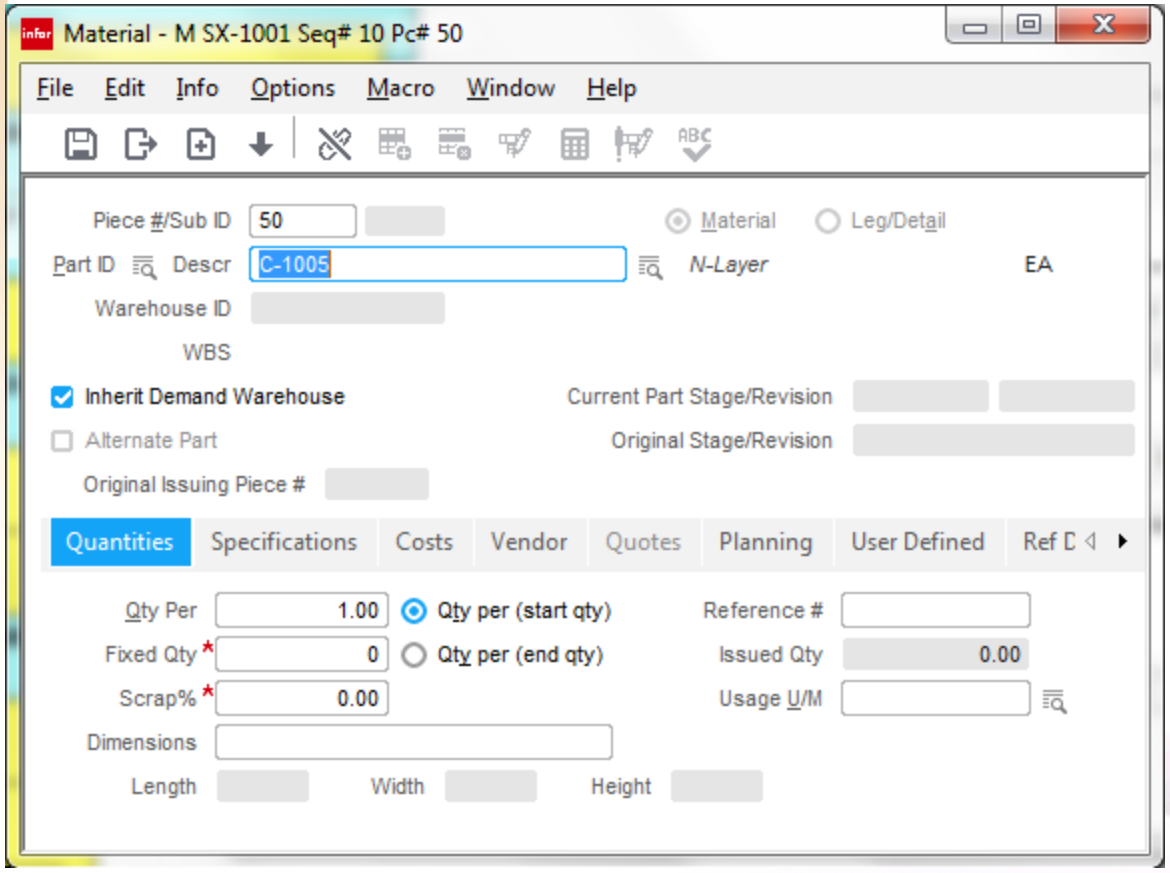
- first step is an Operation called Foundation Assembly coded as FOUNDASSY.

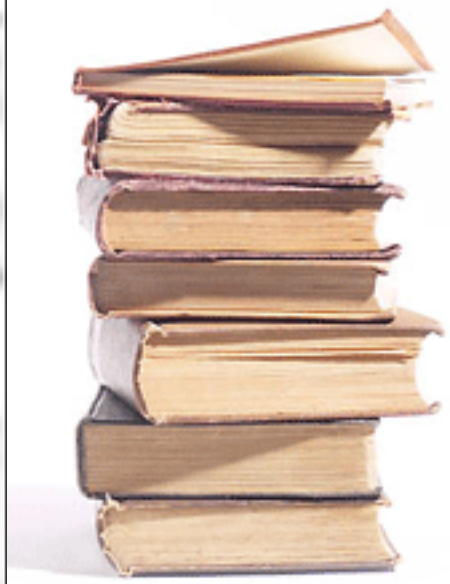


- Students follow these steps to add this operation Click on the card so that an arrow points at it
  - Right Click and a menu will appear
  - Select ‘Add an Operation’
  - A new box will appear on the screen

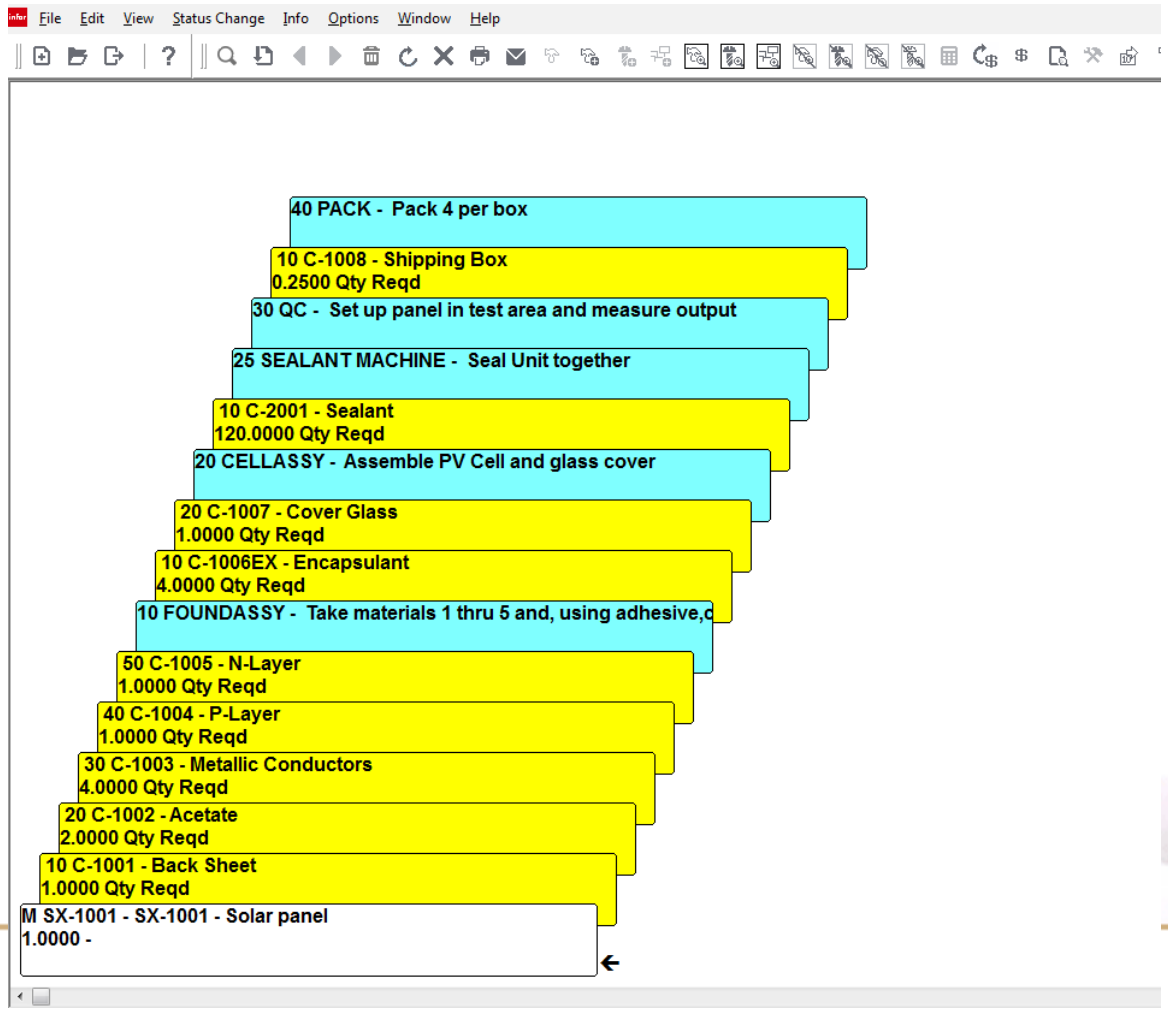
Students Add Material to the Product Structure

- To add material

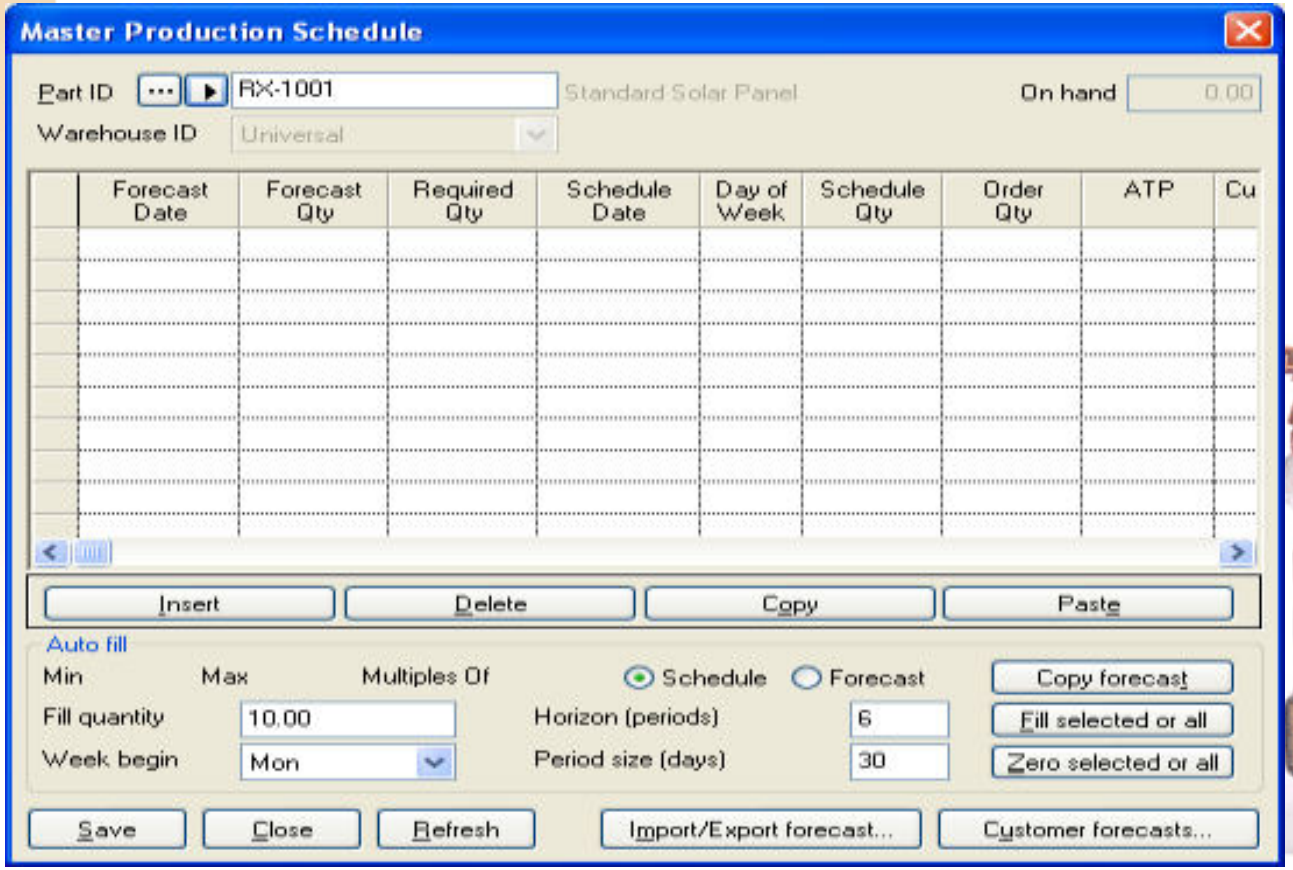




If we complete all of the parts and resources, the "Bill of Manufacture" should look like this:



Now they select the File pull down menu and then they select the Master Production Schedule.



Students enter a Master Production Schedule into Visual

Students Receive a Forecast from Sales

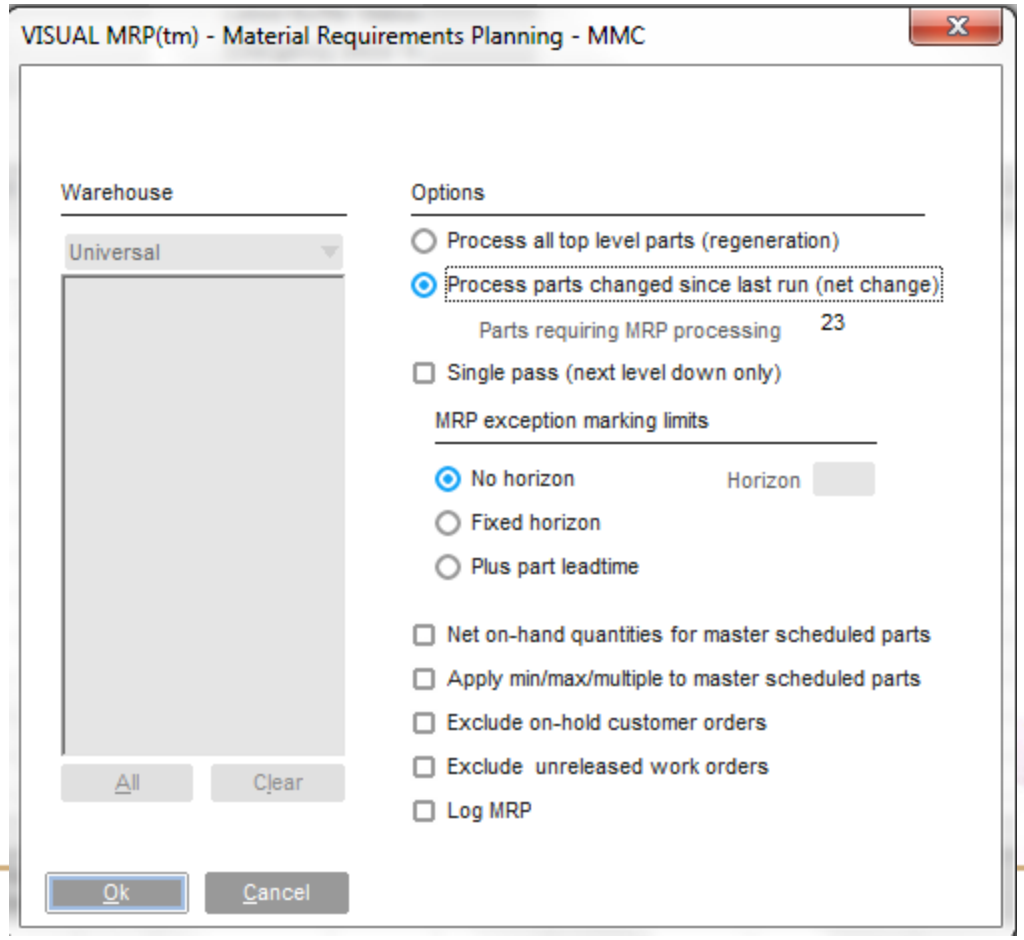
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SX-1001	50	100	200	250	325	400	450	500	500	650	650	700
RX-1001	200	200	225	250	250	275	275	300	300	300	325	350

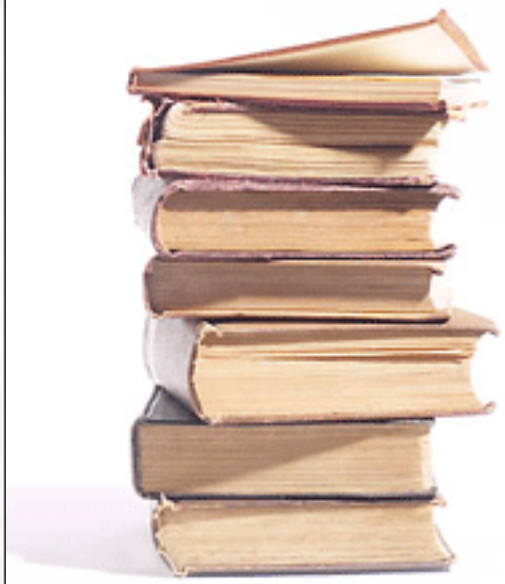
Then enter into a Master Production Schedule in the ERP System

	1/1/2014	2/1/2014	3/1/2014	4/1/2014	5/1/2014	6/1/2014	7/1/2014	8/1/2014	9/1/2014	10/1/2014	11/1/2014	12/1/2014
2014*	50.00	100.00	200.00	250.00	325.00	400.00	450.00	500.00	500.00	650.00	650.00	700.00
Customer Demand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dependent Demand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Demand	50.00	100.00	200.00	250.00	325.00	400.00	450.00	500.00	500.00	650.00	650.00	700.00
Current MPS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current MRP plan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Suggested MRP Release												
Current Firmed Orders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Projected Inventory	-50.00	-150.00	-350.00	-600.00	-925.00	-1325.00	-1775.00	-2275.00	-2775.00	-3425.00	-4075.00	-4775.00
Suggested MPS	50.00	100.00	200.00	250.00	325.00	400.00	450.00	500.00	500.00	650.00	650.00	700.00

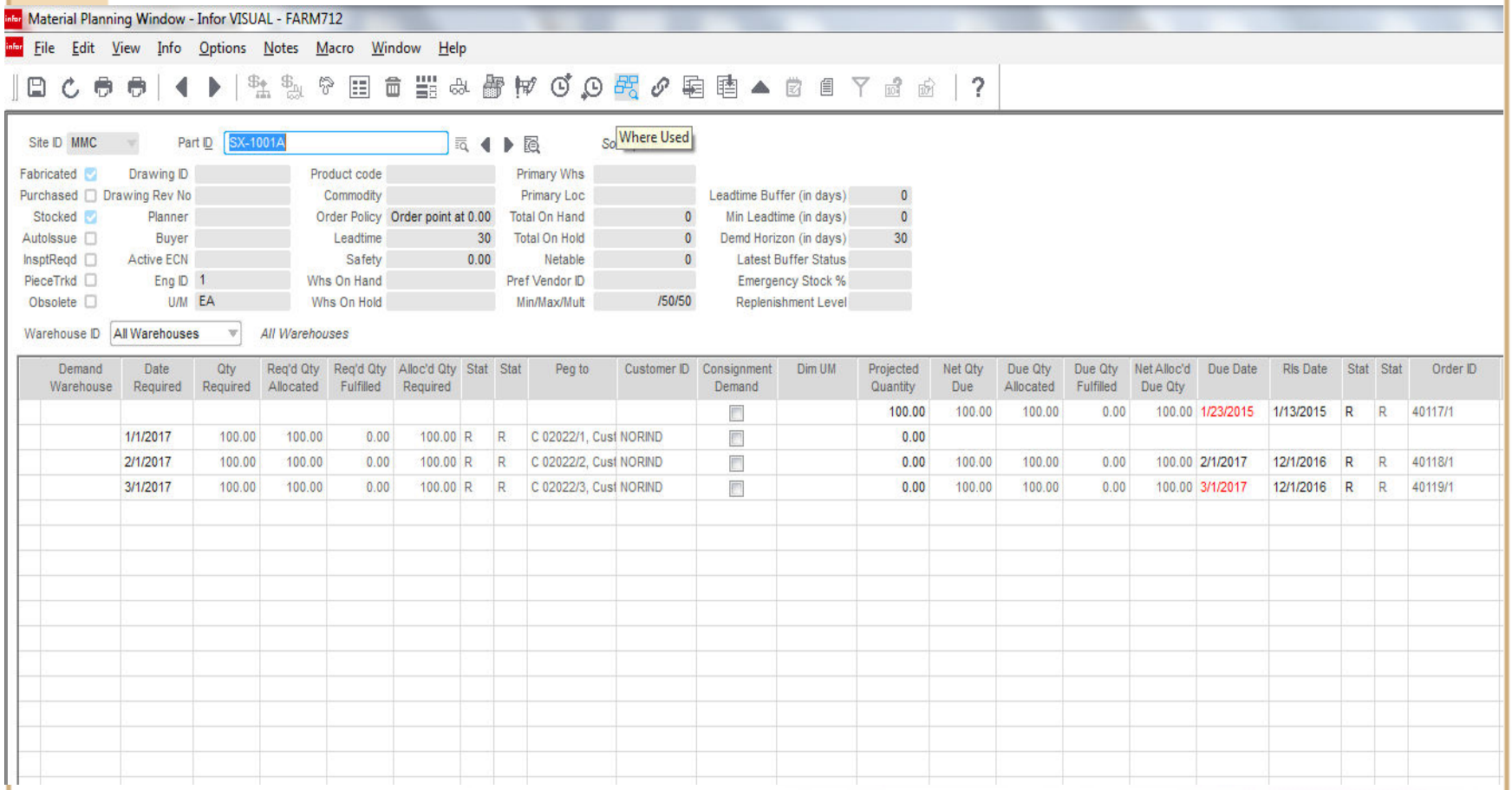
Running MRP

- File pull down menu again but now select ‘Material Requirements Planning





When the MRP run is complete, the Material Planning Window will look this

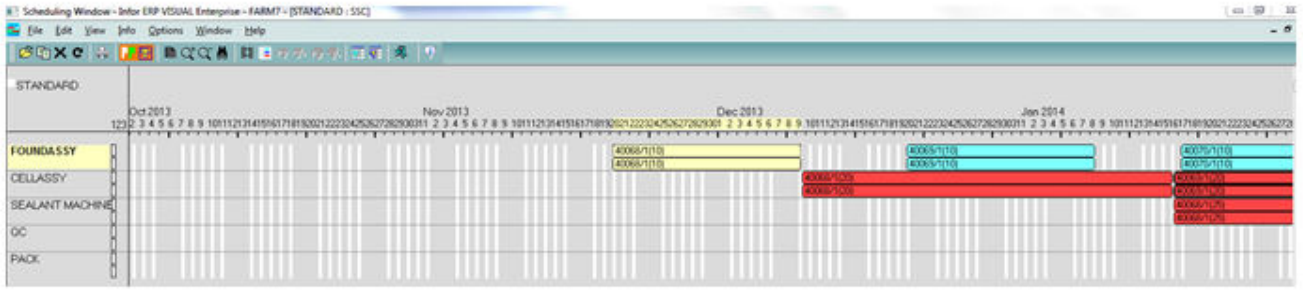


Student Inputs

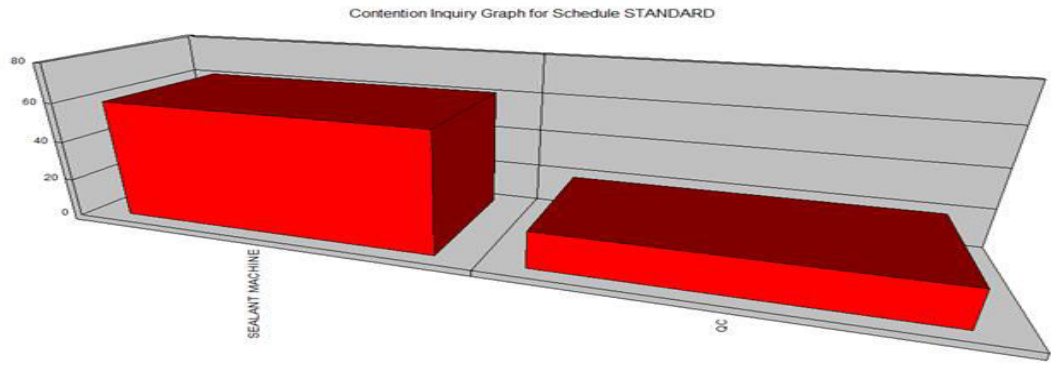
- Students can see that MRP used the Master Production Schedule data to generate 'planned' work orders' for the quantity and dates on the schedule.

Scheduling and Capacity Planning are Reviewed

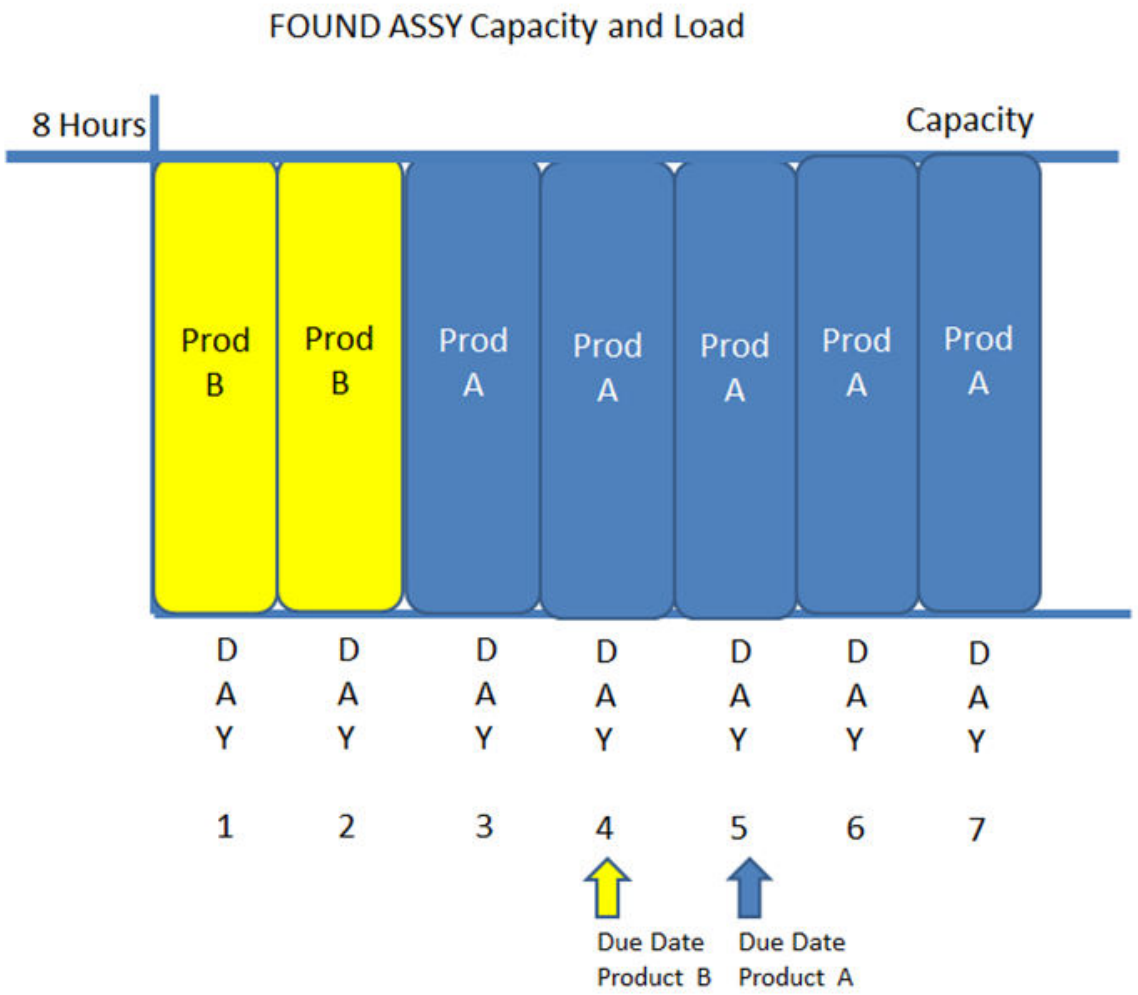
Scheduling



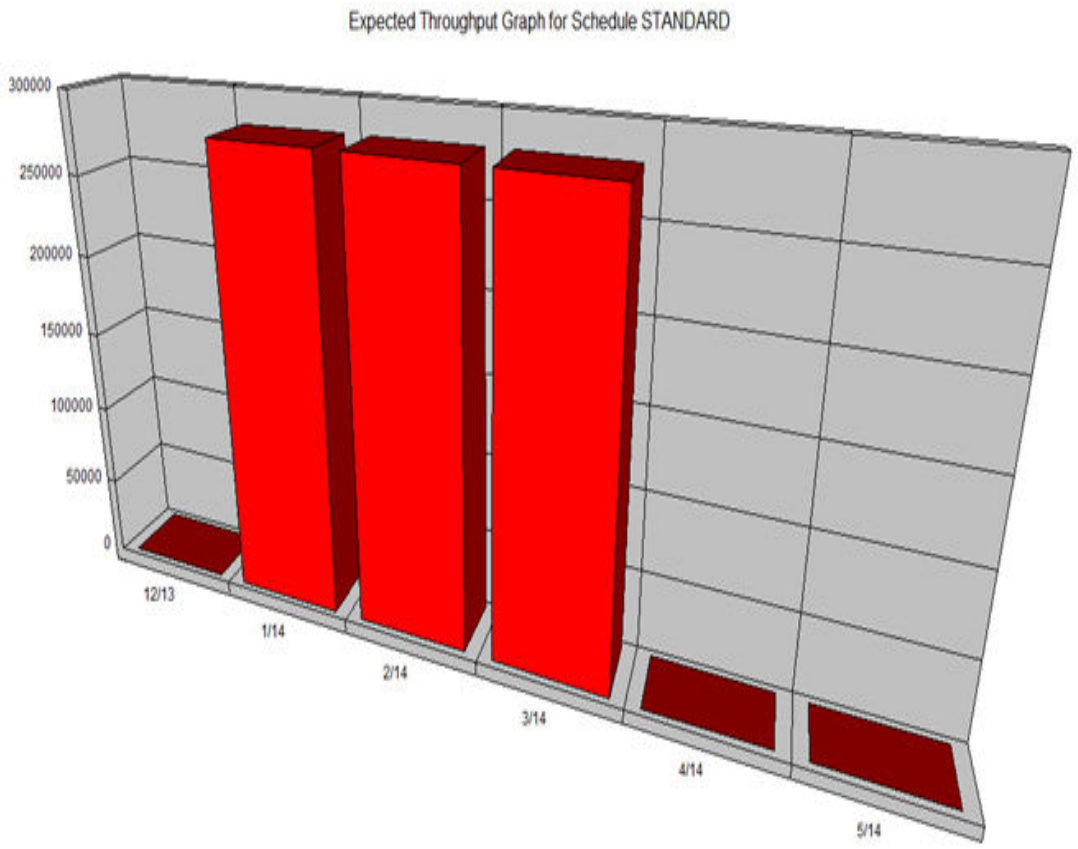
To Capacity Planning



Theory of Constraint Concepts



Understanding how Throughput can be optimized



Conclusion

By addressing the **skills shortage** in large, small and medium size manufacturers, distributors and service providers,

we are **preparing** our students to use this enterprise technology effectively and efficiently.

Conclusion

In **matching**, the undergraduate curriculum in these ERP courses with **skills** that our local industries **need**

we are meeting those critical elements in our national and local economy.

Conclusion

- Students from all disciplines take these ERP courses at Farmingdale State College and there are many now placed at local companies meeting these needs.

Conclusion

- With over 700 companies locally, that use this ERP, there is a **demand** for this type of prepared student
- **prepare** our students for entry into manufacturing, distribution and or service companies.

Partnerships

- Classroom visits are very valuable to helping the **students connect** the idea and acquire the knowledge
- Hands on applications in the lab **reinforce** the process
- Tours **cement** the understanding

Farmingdale State College is dedicated to:

Teaching through

innovative and effective

methods by developing and promoting the use of real world tools in our business and computer courses with the help of our **Industry Partners**

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Questions?

Thank you

Gene and Jill

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