e-Prelude.com

The Picaso Exercise

This exercise can be done with the software basic level

Introduction

Objective of this exercise

This exercise presents the main functions of **e-Prelude**, in a very simple and global perspective.

In this exercise, the data corresponding to a simplified model of a production system are introduced and the whole planning process is implemented.

As a consequence, the technical data (items, bills of materials, work centers, routings, etc.) will be entered in the folders. This first step permits the user to clearly understand the structure of the considered system. Furthermore, this step also fully illustrates the different types of master data and their links.

In the second step, these data will be used in order to simulate a planning process over a given horizon, simultaneously for the physical flows, information flows and financial flows (billing process).

The business functions in the company

e-Prelude is structured with respect to the typical company skills:

- **Engineering**: this menu is associated to the *Engineering Department* which develops and updates information concerning the items, bills of materials and manufacturing routings.
- **Sales**: this menu is associated to the *Sales function* in charge of the customer's orders, sales forecasts, sales orders, etc.
- **Planning**: this menu is associated to the *management function* in charge of the operational planning of purchases, productions and sales.
- **Purchasing**: this menu is associated to the *purchasing function* in charge of vendors, purchase orders.

- **Logistics**: this menu is associated to the *function* in charge of the physical operations (receipts, issues, shipments, etc.).
- **Scheduling**: this menu is associated to the *management function* in charge of the short term planning of each operation on each production resource.
- **Control:** this menu is associated to the *Production Activity Control function* in charge of the recording information about the manufacturing operations and material consumption.
- **AR&AP:** this menu is associated to the *accounting department* in charge of managing financial relations with customers and vendors (invoicing, payments,).

Using e-Prelude

Pages Manipulation

Many pages can be called successively during the various manipulations of the software. To return to the previous page, click the **Back** button at the top left of all pages.

Do not use the browser Back button.

Access to the functions is done in four ways:

- by the menus,

- by the icons of the upper bar (the function concerned is recalled when the mouse is placed on the icon),

- by the graph on the **Information Flow** tab on the **Administration** page,

- By the scheme on the **Work Flow** tab of the **Administration** page.

Entering data

Throughout this exercise, data will be entered in the various pages. All entries must be confirmed by the **OK** button. When certain information is not specified in the statement, it means that the values proposed by default must be retained.

You can quickly access a record by clicking on a line in the list of entities on the left panel.

Questions

Some questions are asked during the development of the successive sessions. These questions are intended to provoke a reflection on the fundamental elements of production management during the manipulation of the functions of the software.

The products

The ***Bookcase*** factory is organized as a production-to-stock system and produces two types of bookcases. One bookcase called BC100 is 100 cm width, the other, BC200 is 200 cm width.

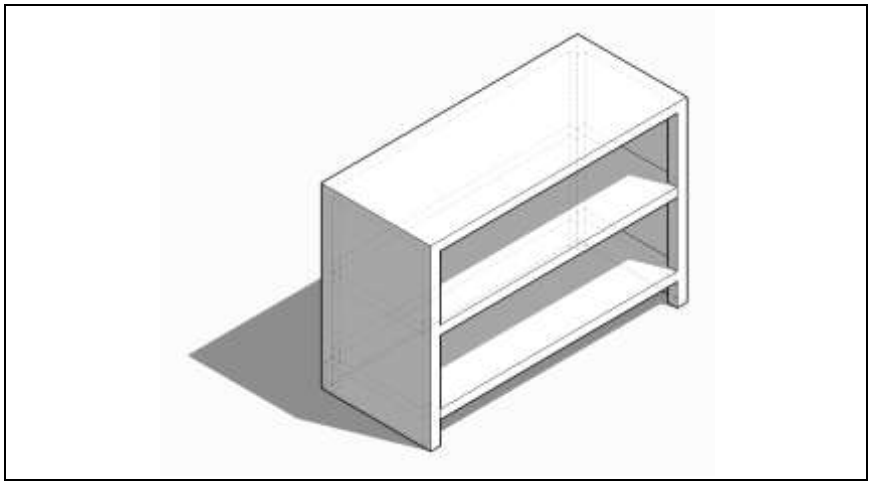


Figure 1

The problem consists of planning and organizing the production of the bookcases during 2022.

In order to do this, the necessary information is of course given and will be gradually introduced during the exercise.

A bookcase of this type decomposes into 3 outside support panels (two small ones on the side and one large one at the back), 4 shaped panels allowing the assembly of the elements, three shelves and twelve metal pegs (4 per shelf),

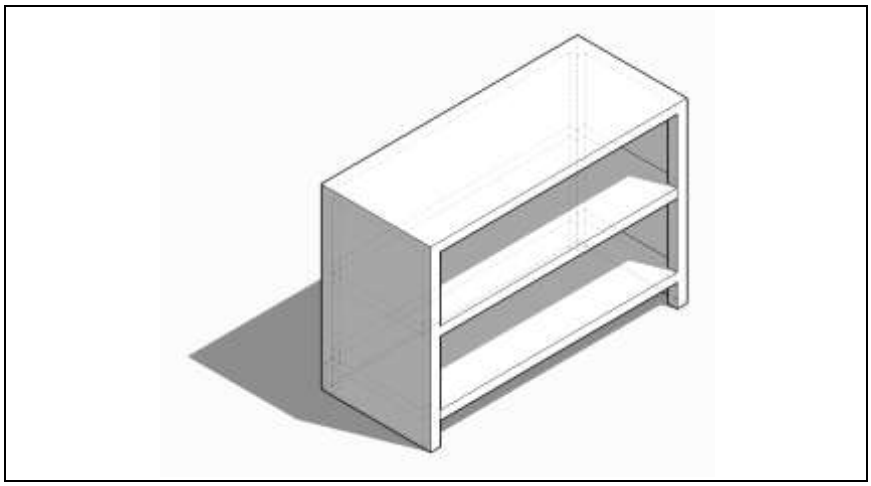


Figure 2

In the factory, production operations are performed by wood shaping machines, saws and assembly workshops.

Session 0: Folder Preparation

Picaso Folder Creation

Access the site **www.e-prelude.com**.

You can then type in your mail address and the access code to login. Tick the **Remember me** box. Click on **Login.** You name is posted.

Click on **Access Application**. A new tab is opened.

On the application login page, click on **Login**. you will be taken to the **Document Management** page.

Click the **New** button and enter the folder name: **Picaso00** and confirm with **OK**. The folder is created and is immediately opened.

The **Administration** page is presented.

Folder Parameters

Current Date adjustment

The current date (fictional in our case) use of the software is January 3, 2022. Change the current date by calling the monthly calendar in the button bar. The date is displayed on the dashboard. It's a Monday.

Folder options

Click on the **Folder Parameters** button.

In the **Folder Title** field, enter **Picaso Case**.

On the **Options** tab, if you wish, you can select the AR & AP (Accounts Receivable and Accounts Payable) option by checking the corresponding box.

This option will be identified in the text by the icon: it allows the creation of the invoices and the entry of the payments, the Tier account inquiries and Tier account balances.

Save the folder

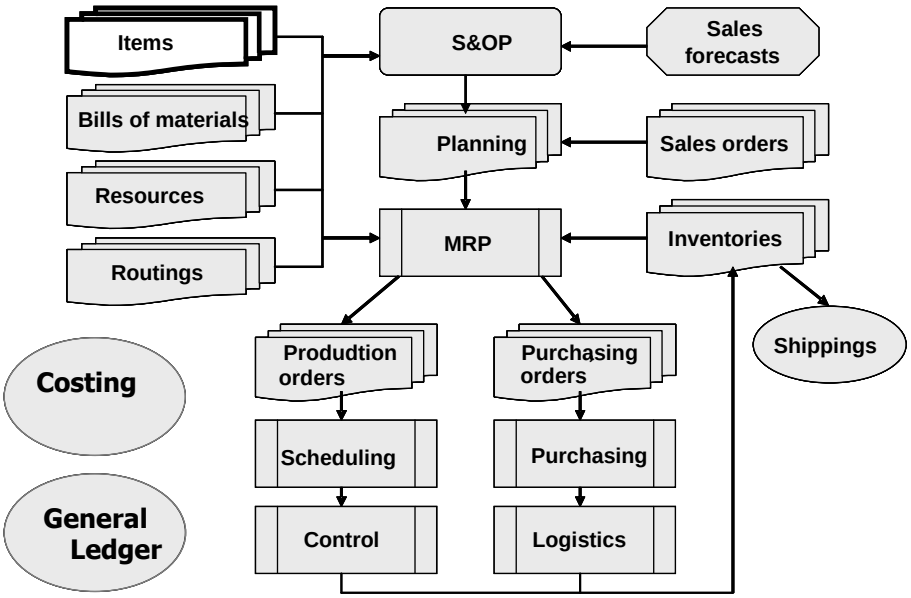
To record folder current situation, click on the Save **Folder** button.

On line Help

The online help (**?** icon at the top right of the toolbar) displays the chapter corresponding to the menu you are on; It contains a complete description of the e-Prelude pages. You will find the answer to most of the questions you have.

To get the full on-line help engine, click on the ? icon in the icon bar.

Session 1: Items



During this phase, you will examine the information that describes all the objects of which the supply and manufacture must be managed. These objects are the **items**. Items correspond on one hand to components (and assemblies) described at the start of the exercise, and on the other hand correspond to raw materials used to manufacture the components. The *Engineering Department* develops and updates information concerning the items.

Save folder as ***Picaso01*** (**Administration** page)

Items [Engineering]

1.1	Items	**Engineering** menu, **Item Maintenance** option	

Enter in the item pages the data proposed in the table below.

You must select the type of the item from the **Select Type** drop-down list before you can create a new item. Select **Manufactured** or **Purchased**.

When a folder is initialized, the **EA** (each) unit and the **WH** warehouse are automatically created. You must select them from the drop-down lists.

When entering data, the **Duplicate** button is used to duplicate an item page whose fields have been completed. In the case where two items have very similar characteristics, this function avoids having to enter all the information twice. Once the first item is entered and validated

by **OK**, click on the button **Duplicate**; Enter the new item code and make minor changes to the second item to be entered.

Item data table

CODE	Description	Unit	Warehouse	BOM Decimals
Manufactured Items				
BC100	Bookcase 100 cm	EA	WH	0
BC200	Bookcase 200 cm	EA	WH	0
SH100	Shelf 100 cm	EA	WH	0
SH200	Shelf 200 cm	EA	WH	0
BP100	Back panel 100 cm	EA	WH	3
BP200	Back panel 200 cm	EA	WH	3
SP000	Side panel	EA	WH	3
SP100	Shelf panel 100 cml	EA	WH	3
SP200	Shelf panel 200 cml	EA	WH	3
SROD	Shaped rod	EA	WH	3
Purchased Items				
WD002	Wood 2mm (2m x 2m)	EA	WH	0
WD010	Wood 10mm (2m x 2m)	EA	WH	0
ROD40	Wooden rod (4m)	EA	WH	0
PEG000	Metallic peg	EA	WH	0

T The sales prices of the finished products are respectively $200 for the item BC100 and $300 for the item BC200.

For those two items, tick the box "**Can be sold**".

To facilitate the control of the entered information, it is possible to visualize during the session the list of the items already entered by clicking on the **List** button of the Item page.

1.2	Items Management Parameters	**Planning** menu, **Item Reorder Policy Maintenance** option	

You must now set the reorder policy for each item.

For each item, select in the drop-down lists the **Reorder Policy: R: Net Requirements** and **Lot Sizing Rule: W Weekly Requirements**. Enter the **Lead Time** in the field and confirm with **OK**.

CODE	Description	Reorder Policy	Lead Time (Days)
BC100	Bookcase 100 cm	RW	3
BC200	Bookcase 200 cm	RW	3
SH100	Shelf 100 cm	RW	3
SH200	Shelf 200 cm	RW	3
BP100	Back panel 100 cm	RW	3
BP200	Back panel 200 cm	RW	3
SP000	Side panel	RW	3
SP100	Shelf panel 100 cml	RW	3
SP200	Shelf panel 200 cml	RW	3
SROD	Shaped rod	RW	3
WD002	Wood 2mm (2m x 2m)	RW	10
WD010	Wood 10mm (2m x 2m)	RW	10
ROD40	Wooden rod (4m)	RW	10
PEG000	Metallic peg	RW	10

The time required to obtain the products (corresponding to the time of completion of the last manufacturing step for an assembly or the delivery time of the supplier for the materials purchased) are specified independently of the size of the production batches or the orders. For example, 3 days for BC100. What do you think? Is this consistent with a production activity planning method?

Vendors and catalogs [Purchasing]

To be able to create invoices, we need to fill several tables.

Call the management function of each table.

VAT Rate Table (*AR & AP menu)*

To determine the VAT rate applied when invoicing items, the VAT rates must first be defined in the VAT rate table. For example, code 2 here represents the normal rate (20%).

Enter '2' as VAT Id. Enter description 'Normal Rate'.

Enter the rate: '20' for instance and confirm with **OK**.

Term of Payment Table (*AR & AP menu)*

Payment terms are used to determine the due date of invoices.

Enter '30EOM' as Id, 'Thirty days End of Month' as description.

Select 30 days in the Credit Term panel and End of Month in the

Confirm with **OK**.

Payment Mode Table (*AR & AP menu)*

The method of payment indicates the means by which suppliers are paid and by which customers are paid.

Enter 'CHK' as Id, 'Check' as description. Confirm with **OK.**

Item Category Table (*Engineering menu)*

Subsequently, categories of items must be defined to indicate the applicable VAT rate per category.

A default category marked with the * character must be defined. The category '*' will be used if no category is specified for an item.

Enter '*' as Id, 'Default Category' as description. Enter '2' in the VAT Rate Id field.

Confirm with **OK**.

1.3	Vendors	**Purchasing** menu, **Vendor Maintenance** option	

Purchased items are supplied through suppliers that need to be specified. We considered here a single supplier. Enter the following information on the **Vendor Maintenance** page (**Purchasing** menu):

Vendor Id	Name
SUPPLY	Global Supplier

T For each supplier, the terms of payment are indicated. For the supplier SUPPLIER, they are set as 30EOM. Select the corresponding code from the drop-down list.

Confirm with **OK**.

1.4	Vendor's catalog	**Catalog** button	☐

For each supplier, it is necessary to describe the items he delivers and under what conditions. The delivery characteristics, described in the following table, must be entered on the **Catalog page** of supplied items obtained by clicking on the **Catalog** button.

Select each item from the drop-down list.

T Purchasing prices can be entered only if the AR&AP option **is** activated.

SUPPLIER Catalog

Item Id	List Price	Lead Time (days)
WD002	20	10
WD010	30	10
ROD40	3	10
PEG000	0.10	10

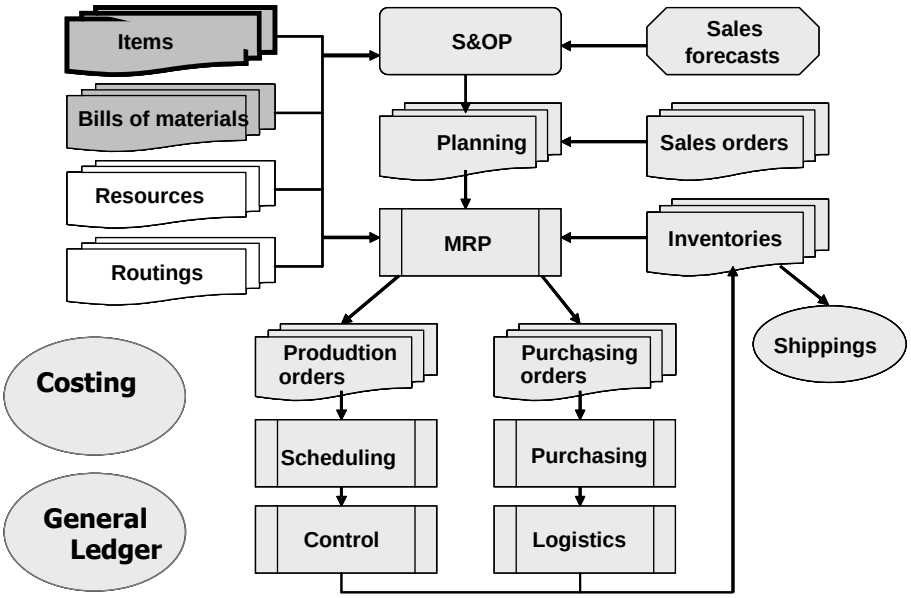
Preferred vendor selection

Enable the **Purchased Item Vendor Selection** page (**Purchasing** menu). For each of the items purchased, a list of potential vendors (here only one) is obtained.

As we have one single vendor, it is the Preferred vendor!

Click on the **Save Folder** button (**Administration** page).

Session 2:
Bills of Materials Maintenance



The different items entered in session 1 are linked to each other. For example *BC100* and *BC200* are items assembled from other parts and items. In this session 2, you will examine these links (component, assembly, sub-assembly,) which are represented as **manufacturing Bills of materials**.

Below is a blown-up representation of the finished products for the considered example,

Save folder as ***Picaso02*** (**Administration** page)

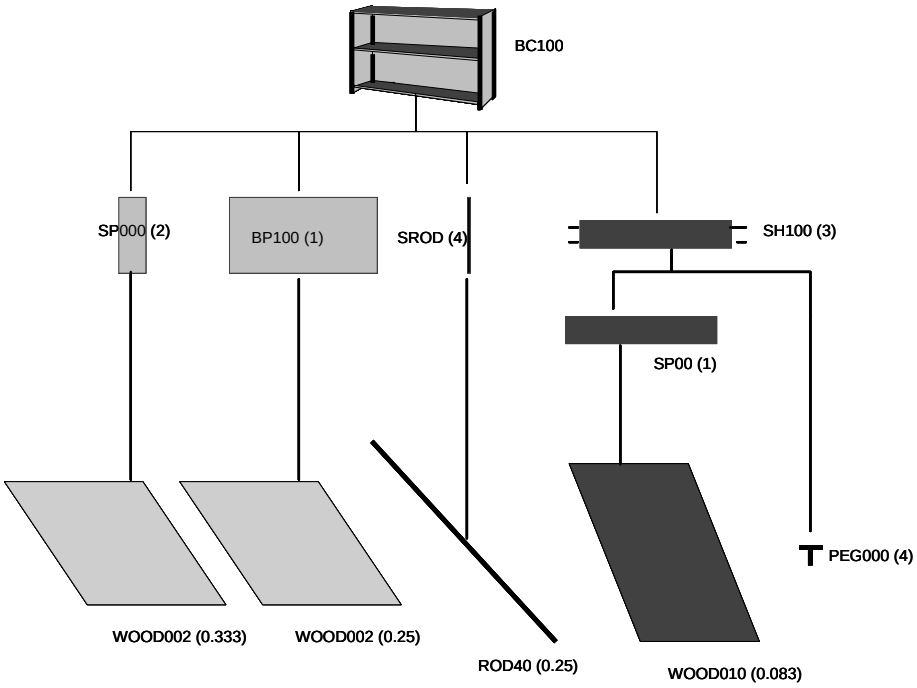


Figure 3: Bookcase product structure

Bills of materials of manufactured items [Engineering]

2.1	Bills of materials of manufactured items	**Engineering** menu, **Bill of materials Maintenance** option	

Entering BOM links

The relationships illustrated in Figure 3 will now be captured and described in detail in the BOM Links List below.

To enter a link, simply do the following:

1) Select Item Type **M: Manufactured** in the drop-down list of the tool bar.

2) select the Parent Item in the left panel list.

3) click on the **Maintenance** button**.**

On the **Product Structure Record Maintenance** page

4) click on button **New**, a BOM link sequence id is posted,

5) select the component in the drop-down list,

6) enter the quantity required,

7) click on button **OK**,

8) When all the links of an item are entered, click the **Back** button, and return to step 2) for the next item.

BOM Link List

Item	Link Id	Component	Quantity
SROD	010	ROD40	0.250
SP000	010	WD002	0.333
SP100	010	WD010	0.083
SP200	010	WD010	0.166
SH100	010	SP100	1
-	020	PEG000	4
SH200	010	SP200	1
-	020	PEG000	4
BP100	010	WD002	0.250
BP200	010	WD002	0.500
BC100	010	BP100	1
-	020	SROD	4
-	030	SP000	2
-	040	SH100	3
BC200	010	BP200	1
-	020	SROD	4
-	030	SP000	2
-	040	SH200	3

Select Item *SP100* and click on the **Graphs** button
- click on the **Product Structure**, **Product Tree** and **Offsets** buttons**,**
- explain the graphs.

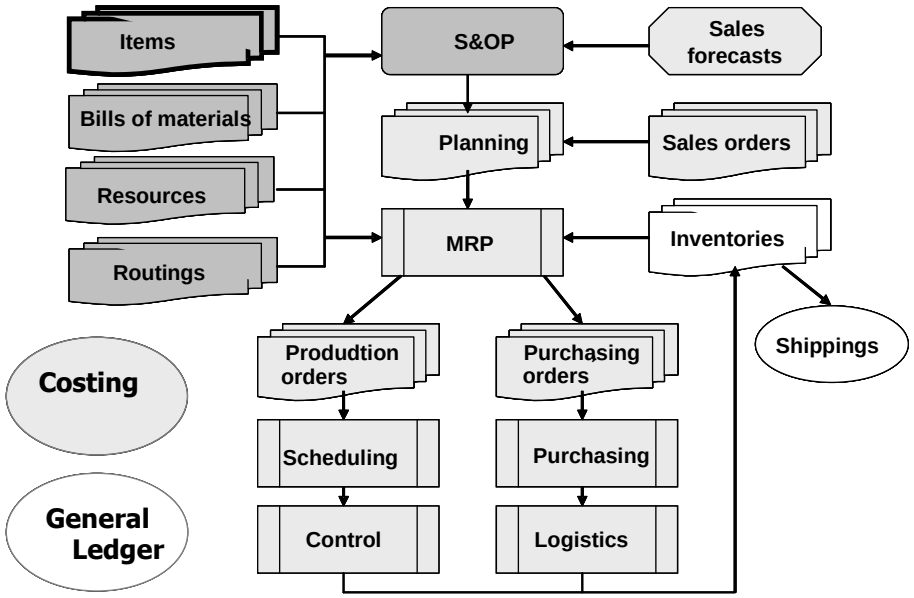
Select Item *BC100*, and click on the **Graphs** button
- click on the **Product Structure**, **Product Tree** and **Offsets** buttons**,**
- explain the graphs.

Select Item *WD002* and
- click on **Single Level Where-used**,
- click on **Multi Level Where-used**.

Enable Item List (**Engineering** menu, **Item List** option)
Explain the **Level** column.
Group items by level (**Group by**… button.

Click on the **Save Folder** button (**Administration** page).

Session 3:
Work Centers and Routings



In this session, we consider the production resources (saws, wood shaping machines…), described as **work centers** and the manufacturing procedures entered as **manufacturing routings**. Each work center is characterized by an activity calendar.

Save folder as ***Picaso03*** (**Administration** page)

Work Centers [Engineering]

3.1	Work Centers	**Engineering** menu, **Work Center Maintenance** option	

We can now describe the work centers. The data corresponding to the table below have to be recorded. Click on the left panel list to see the data recorded for each work center.

Work Center Table

Work Center Id	Description	Type	Calendar	Capacity Coefficient
100	Cutting	F	PC	1
200	Machining	F	PC	1
930	Sub Assembly	F	PC	1
940	Final Assembly	F	PC	1

Routings [Engineering]

3.2	Routing Maintenance	**Engineering** menu, **Routing Maintenance** option	

Now, as the production resources are known, the operation times and the routings can be defined.

Enter Routing Id and description, confirm with **OK** then click on **Operations** button to enter successive operation characteristics of the process.

The **Routing Operation Maintenance** page is enabled.

For each operation, click on button **New**. An operation number is posted; enter:

- operation description,
- Work center if (from the drop-down list),
- Machine Setup Time,
- Machine Run Time,
- Move Time.

Do not change the field 'Quantity per Time' which should always be 1.

Save each operation by clicking on **OK**. When all the operations of a routing are entered, click on button **Back**.

The **Duplicate** button on the Routing Maintenance page makes it easy to enter.

Enter the following routings:

Routing Table

Routing Id	Operation Id	Description	Work Center	Setup Time	Run Time	Move Time
FA	-	**Bookcase assembly**				
-	010	Final Assembly	940	0	0.5000	3
SC100	-	**Shelf Preparation 100**				
-	010	Shelf Cutting	100	0.25	0.0400	3
-	020	Shelf Machining	200	0.50	0.0600	3
SC200	-	**Shelf Preparation 200**				
-	010	Shelf Cutting	100	0.25	0.0600	3
-	020	Shelf Machining	200	0.50	0.0800	3
RD	-	**Rod Preparation**				
-	010	Rod Cutting	100	0.25	0.0133	3
-	020	Rod Machining	200	0.50	0.0600	3
BPC100	-	**BP Cutting 100**				
-	010	BP Cutting 100	100	0.25	0.0400	3
BPC200	-	**BP Cutting 200**				
-	010	BP Cutting 100	100	0.25	0.0600	3
SP	-	**SP Cutting**				
-	010	SP Cutting	100	0.25	0.0500	3
PI	-	**Peg Insertion**				
-	010	Peg Insertion	930	0	0.1250	3

Where are specified material requirements?

What is Move Time?

Item – Routing Links

3.3	Item - Routing Links	**Engineering** menu, **Item Maintenance** option	

After having created all the routings, it is necessary to specify for each item which routing is used to carry out its production.

On the **Item Maintenance** page, select the **Manufactured item type** from the drop-down list.

Call each item successively.

On the lower panel of the page, click on the **Add…** button to display the routing list. Select the routing relevant to the item and click on the **Add** button.

The selected routing is added to the list of routing bound to the item. To specify that this routing should be used for production, select the routing, tick the **Release** box and confirm with **OK**. Go to the next article.

Item – Routing Link Table

Item	Routing
BC100	FA
BC200	FA
SH100	PI
SH200	PI
BP100	BPC100
BP200	BPC200
SP000	SP
SP100	SC100
SP200	SC200
SROD	RD

Call the **BOM Maintenance** page. Select item BC100. Click on the **Graphs** button, then on the **Resources** button. Comment the graph.

How can you evaluate the "machine" work loads of the different work centers corresponding to the manufacturing of a batch of 100 rods?

3.4	Resource Graph	**Engineering** menu, **Bill Of Materials Maintenance** option	

Now, you can see the summary of the information entered.

On the BOM page, select item BC100, click on the **Graphs** button. On the Bill Of Materials Graphs page, click on the **Resources** button.

Click **Offsets** button. View the length of the procurement and production cycle of the BC100 and BC200 finished products. What are the production lead times for these items and what are the cumulative lead times?

At this level, what is the relation between the production cycle show on the BOM pages and operating times specified in the routings?

Click on the **Save Folder** button (**Administration** page).

Session 4:
Inventory transactions

In the previous sessions technical data have been entered and capacity balancing realized. Before explicitly considering flow planning, this session displays the different issues associated to physical inventory management.

Save folder as ***Picaso04*** (**Administration** page)

Warehouses and inventories [Logistics]

4.1	Warehouses	**Logistics** menu, **Warehouse Table Maintenance** option	

Several warehouses can be defined in the warehouse table: one for raw materials, one for semi-finished components and one for finished goods…

In this exercise, we use only one warehouse named WH which has already been created.

4.2	Inventory Transactions	**Logistics** menu, **Physical Inventory Counting** option	

We will enter the beginning inventories of the company. The following table shows the quantities of items available in the warehouse as of 01/03/2022. Select the **WH** warehouse.

Enter for each item in the left panel list the quantity counted which appears in the table below. Confirm each by **OK**.

Quantity counted

Item	Quantity counted
BC100	5
BC200	10
SH100	10
SH200	5
BP100	50
BP200	50
SP000	20
SP100	40
SP200	40
SROD	20
WD002	20
WD010	10
ROD40	10
PEG000	200

4.3	Inventory Transactions	**Logistics** menu, **Inventory Transaction History** option	

This function lists all the inventory transactions. They can be grouped by date, warehouse or item.

Inventory Inquiries [Logistics]

4.4	Warehouses	**Logistics** menu, **Inventory Inquiry per Warehouse** option	

This page presents all the items which are stored in a warehouse. Select **WH** warehouse.

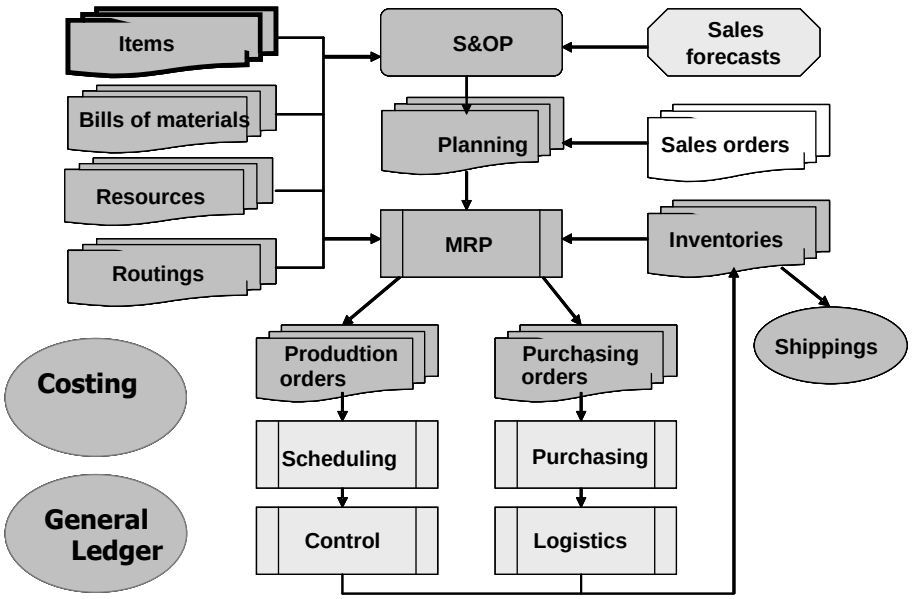
You can select a line and click on the **History** button to see all the transactions explaining ending inventory.

4.5	Items	**Logistics** menu, **Inventory Inquiry per Item** option	

This page presents all the stock positions for an item.

Click on the **Save Folder** button (**Administration** page).

Session 5:
Sales Order Entry



We consider now the demands that have to be delivered by the plant. These demands are entered as customer orders. From these orders it will be possible to deduce the work orders and purchasing orders guaranteeing feasibility of the required deliveries to customers.

Save folder as ***Picaso05*** (**Administration** page)

Definition of the Standard Calendar [Planning]

The schedule defines the working periods of the company. Knowledge of the time available is fundamental to plan all the company activities.

5.1	Calendar	**Planning** menu, **Calendar Maintenance** option	

This page presents for the current week the days for which it is possible to specify time slots defined by hours of beginning of work and working durations.

To simplify the entry of the time slots, we will first define a standard week. Click the **Update Std Wk** button.

Enter the five working days of the week (Monday to Friday) 8 as the start time and 8 as the Duration (the **Copy Day** button can be used to copy a day to the next one). Click on the **OK** button.

To carry over this standard week over the coming weeks, click on the **Copy up to...** button and select the date of 03/31/2022. Weekly calendars are created. They can be reviewed and modified if required.

Click on the button bar right most button names **Graph per…** and select Weeks and Month to sum up working hours.

Customers [Sales]

The customers have to be defined first.

5.2	Customers	**Sales** menu**, Customer Maintenance** option	

Enter the information of Customer Table below. Other fields are optional.

Customer Table

Customer Id	Company	Discount	Term Of Payment	Credit Limit
CUSTA	Customer A	0%	30EOM	10000
CUSTB	Customer B	0%	30EOM	15000

T Term of Payment is 30EOM. Pick 30EOM in the drop-down list.

T Credit limit fields are only available if the AR&AP option is active.

Sales Orders [Sales]

5.3	Sales Order Maintenance	**Sales** menu**, Sales Order Maintenance** option	

Two sales orders will be entered, according to the table below.

The data entry procedure is as follows:

1. in order to define a new order click on the **New** button,
2. select the customer in the drop down list,
3. select the delivery date,
4. click on the **Lines** button and accept the recording,
5. on the **Sales Order Line Maintenance** page, for the two order lines
    a. click on the **New** button,
    b. select the item in the drop down list,
    c. enter the quantity ordered,
    d. Validate by the **OK** button.
6. Click on the **Back** button and enter the second sales order.

Sales Order Table

Order # **00000001**	Customer: **CUSTA**	Delivery date: **01/28/2022**
Line 001	Item : **BC100**	Quantity : **20**
Line 002	Item : **BC200**	Quantity : **10**
Order **00000002**	Customer: **CUSTB**	Delivery date: **01/28/2022**
Line 001	Item : **BC100**	Quantity : **15**
Line 002	Item : **BC200**	Quantity : **25**

Shipping Date is set on the day before Delivery Date:
Transportation Lead Time is 1 day.

5.4	Master schedules	**Planning** menu**, Master Schedules** option	

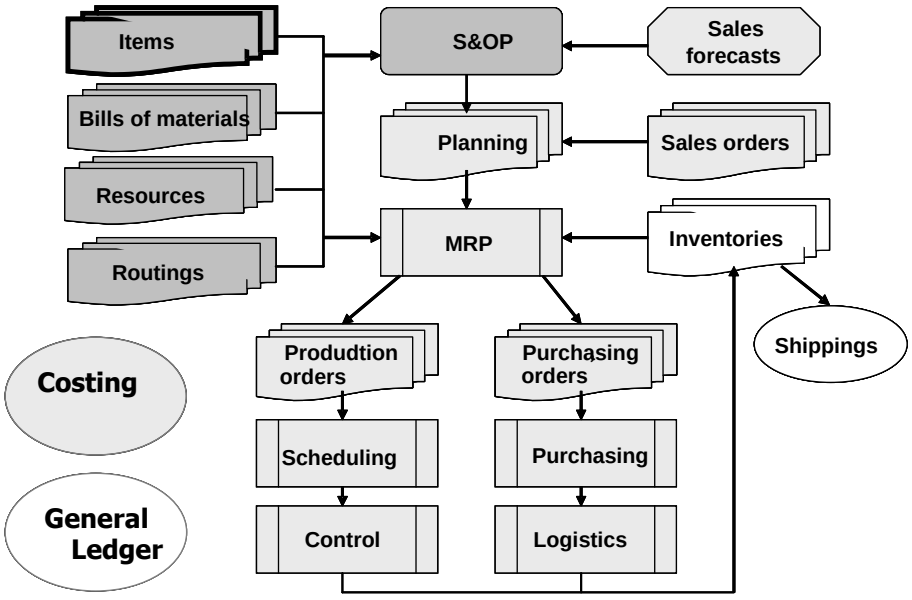
Access the master schedule for item *BC100*.

You can see that the sales orders you entered are in the Sales Orders line.

By ticking the **New suggestions** box, the new planned work orders are calculated.

Click on the **Save Folder** button (**Administration** page).

Session 6: Material Requirements Planning (MRP)



The MRP procedure

In this session, we will calculate all that is required to meet the demand.

Save folder as ***Picaso06*** (**Administration** page)

Purchasing and production activities will be planned accordingly to the finished goods master schedules (namely corresponding to items *BC100* and *BC200)*.

The MRP process plans work orders and purchase requisitions in order to supply the requirements of the master schedules.

6.1	MRP	**Planning** menu, **Material Requirements Planning** option	

Enter the ending date for the planning horizon (*02/28/2022*) and click on the **OK** button.

The MRP calculation takes a few seconds.

6.2	Planned Work Orders	**Planning** menu, **Planned Work Order List** option	

This list presents the work orders which have been generated by the MRP algorithm for all the manufactured items.

By double-clicking on any work order in the list, the **Planned Work Order Maintenance** page is posted.

Select the first Planned Work Order.

How the Release Date, Due Date, the working hours and the production cycle and were calculated? Which is the routing used to evaluate the Production Cycle?

The **Components** tab shows the Components requirements for this work order.

6.3	Planned purchase requisitions	**Planning** menu, **Planned Purchase Requisition List** option	

This list presents the purchase requisitions which have been generated by the MRP algorithm for all the purchased items.

By double-clicking on any purchase requisition in the list, the **Planned Purchase Requisition Maintenance** page is posted.

Select the first Planned Purchase Requisition.

How the Order Date and Required Date were calculated?

6.4	Master schedules	**Planning** menu**, Master schedules** option	

After the computation of the planned orders by the MRP procedure, you can view projected inventory profiles. Select the item *BC100*.

By clicking on any cell of the first six lines the underlying data are displayed.

On the SROD item, click the **Pegging** button. Click the **Open All** button. Explain.

Capacity Requirements Planning

The workloads directly generated by the planned production orders can be computed by the **Infinite Capacity Scheduling** function.

It consists in calculating the earliest and latest dates for each work order without considering the available capacity.

At the same time, the work loads are calculated for each work enter and for each period.

6.6	Infinite Capacity Scheduling	**Planning** menu**, Infinite Capacity Scheduling** option	

Set the **CRP Limit Date** to 02/28/2022 and click on **OK**.

6.6	Infinite Capacity Scheduling	**Planning** menu**, Scheduling Chart** option	

The scheduling chart displays the planning corresponding to the planned orders. Select the planning according to the different dates: **Required, Forward and Backward** in the tool bar,

6.7	Planned Work Orders	**Planning** menu**, Planned Work Order Maintenance** option	

Select the first planned order.

Click on the **Dates** tab which shows the dates which have been calculated.

The schedule associated to this order can be displayed via the **Gantt** button.

Slacks Analysis

6.8	Slacks	**Planning** menu**, Planned Work Orders Slacks** option	

For the different planned work orders, it is possible to compute the slacks corresponding to the infinite capacity schedule. Some work orders have negative slacks.

How are slacks calculated? What can we conclude? What are the advantages of having positive slacks on some work orders? What do negative margins mean?

Workload Analysis

Once the infinite capacity schedule is made, it is possible to compute the corresponding workloads for the different resources.

6.9	Work Load Profile	**Planning** menu, **Workload Table** option	

This page shows the workloads for each work center totaled per period (day, week, and month).

Click on a cell. The list of work orders generating the work load is posted.

6.10	Work Load Profile	**Planning** menu, **Workload Chart** option	

Select each of the work centers in the list.

Use the **Periods** and **Type** buttons to show the associated work center capacity utilizations.

Are there potential problems? What can we conclude?

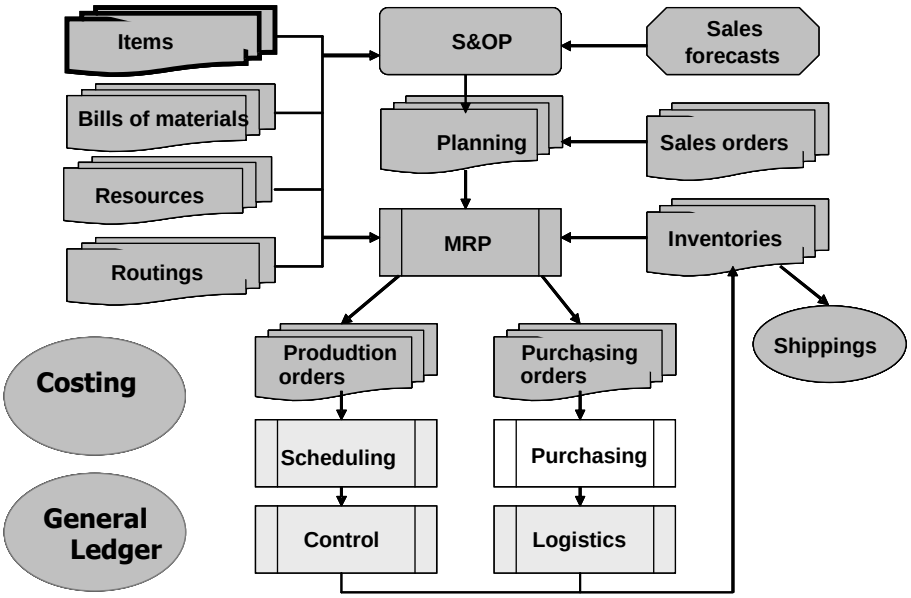
6.11	Sales orders approval	**Sales** menu**, Sales Order Maintenance** option	

As it seems possible to carry out orders received on the requested dates, we can approve them.

Open successively the two sales orders that have been entered and approve each order by clicking on the **Approve** button. Confirm the approval.

Click on the **Save Folder** button (**Administration** page).

Session 7:
Purchase Orders Entry



Save folder as ***Picaso07*** (**Administration** page)

The required purchased orders will be transmitted to the corresponding vendors (for a time horizon until 01/28/2001).

Review **Planned Purchase Requisitions** (**Planning** Menu).

7.1	Purchase Requisition Conversion	**Planning** menu**, Planned to Firm Purchase Requisition Conversion** option	

This convert the planned purchase requisitions Enter *01/28/2022* as *Conversion End Date* and click on the **OK** button. The generated firm purchase requisitions are passed to the Purchasing Department which will included them into purchase orders.

View the list of firm purchase requisitions via the **Firm Purchase Requisition List** function in the **Purchasing** menu.

Purchase Order Entry [Purchasing]

7.2	Purchase Orders	**Purchasing** menu, **Purchase Order Maintenance** option	

The firm purchase requisitions are transformed into purchase orders.

Click on **New** in order to start a new order.

Select the vendor (namely *SUPPLY*) in the drop down list or click on the left panel on a firm Requisition.

Enter *01/17/2001* as delivery date.

In order to integrate the purchase requisitions, click on the **PR Integration** button. Accept recording.

On the Purchase Requisition Integration window,

1- Tick the **Select All** box to select all the purchase requisitions,

2- Tick the **Delete Requisition Orders** box,

3- Click on **OK.**

The purchase order lines have been prepared.

Click on the **Approve** button and confirm. This means that the purchase order is sent to the vendor.

7.3	Expected Receipts	**Purchasing** menu, **Purchase Order Book** option	

The list presents the order lines to be delivered by the vendors.

Purchase order receiving [Logistics]

The purchase order will be received into the warehouse.

7.4	Change the current date	**Administration** page	

Set the folder date at *01/17/2022* on the **Administration** page.

7.5	Receiving	**Logistics** menu**, Purchase Order Receipt** option	

Select the first order in the list.

The purchase order lines are displayed. Validate the receiving by clicking in the O**K** button.

The purchase order is now closed.

7.6	Inventory	**Logistics** menu**, Inventory Inquiry per Item** option	

The corresponding inventory levels for the received items can be displayed. Select item *PEG000*.

The list of inventory transactions can be displayed by clicking on a line.

Vendor Invoice Entry [AR&AP]

T The vendor invoice is to be recorded.

7.7	Vendor invoices	**AR&AP** menu, **Vendor Invoice Entry** option	

Click on the **New** button. Select the vendor *SUPPLY*. The list of receipt notes is displayed in the left panel.

Click on the Receiving Note.

The material amount, the VAT amount and the amount inclusive of VAT are displayed. The maturity date has been calculated.

Enter 12345678 as Vendor Invoice Id.

Confirm by clicking on the **OK** button.

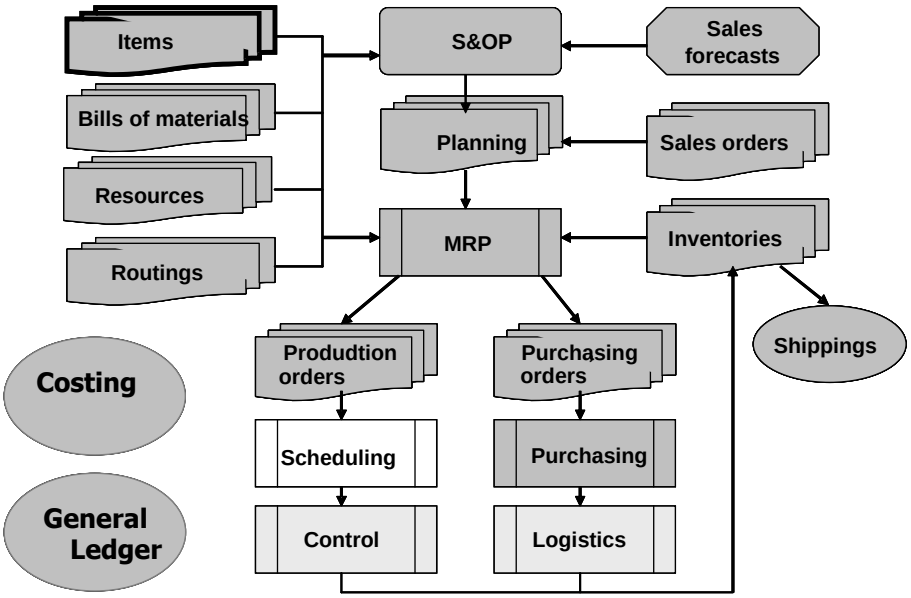
7.8	Vendor invoices	**AR&AP** menu, **Account Payable Inquiry** option	

Select SUPPLIER in the vendor list.

You can see the invoice which has been recorded.

Click on the **Save Folder** button (**Administration** page).

Session 8:
Detailed Scheduling



Via MRP, a list of work order has been generated in order to deliver the item demands. The release date and the due date for each production order have been computed. The planned work orders have been converted into firm work orders.

Save folder as ***Picaso08*** (**Administration** page)

Planned to Firm Work Order Conversion [Planning]

If the planned orders seem consistent, they should be converted into firm orders (which are not modified anymore by next MRP process).

8.1	Work Order Conversion	**Planning** menu**, Planned to Firm Work Order Conversion** option	

Enter *01/28/2022* as *Conversion End Date* and click on the **OK** button. This converts all the Planned Work Orders with an order date earlier than or equal to the date specified into ***Firm Work Orders***.

Explain why we need to convert Planned orders into Firm Orders.

The **Firm Work Order List** can be reached on the **Scheduling** menu.

8.2	Infinite Capacity Scheduling	**Planning** menu**, Infinite Capacity Scheduling** option	

Launch again the **Infinite Capacity Scheduling** function and click on the **OK** button.

Once the infinite capacity schedule is made, it is possible to compute and display the resource workloads.

Firm Work Orders List [Scheduling]

8.3	Firm Work Orders	**Scheduling** menu**, Firm Work Order List** option	

Access the list of work orders to be scheduled. Double-click on the first order in the list. The **Firm Work Order Maintenance** page is posted. Recall the first Work Order for item SP000.

The panels in the page display a full description of the characteristics of the order.

Operations are created automatically from the release routing for all orders when they are firmed up from the planned order.

During the infinite capacity process, a study of the relationship between loads and capacity was carried out. Since it is necessary to obtain a schedule that respects the due dates of the OFs generated by MRP, it is clear that the load / capacity balances of the work centers and the machines play a fundamental role in the proper functioning of the plant management procedure.

How does the infinite scheduling and the load calculations corresponding to the work orders generated by MRP constitute only a partial (or global) analysis of the manufacturing lead times and loads which will actually be observed from day to day in the factory workshops?

It is now necessary to plan the operation sequences of the firm orders. The ***Detailed Scheduling*** function plans the different operations for the resources, namely for the machines (while the ***Infinite Capacity Scheduling*** was made at the work center level). Clearly, for the different work orders, scheduling has to take into account the release date and the due date defined by the MRP/CRP process.

Machine Entry [Engineering]

8.4	Firm Work Orders	**Engineering** menu**, Work Center Maintenance** option	

We have to enter information on each machine in the plant. In this exercise, we assume that we have only one machine per work center.

To enter machines, select each work center and click on the **Machines** button.

Enter for each machine the information from the table below and confirm with OK each time before switching to the next work center by the **Back** button.

Machine Table

Work Center	Machine	Description
100	SAW	Saw
200	WM	Wood Machine
930	SAAL	Subassembly Assembly Line
940	FAL	Final Assembly Line

We now have all the information necessary to carry out the scheduling.

The scheduling process can then be launched. This process will generate a production schedule for each operation of each firm work order on the machines.

Planning Chart and Machine Schedule [Scheduling]

8.5	Prepare Schedule	**Scheduling** menu**, Finite Capacity Scheduling** option	

We start by scheduling one single work order.

Select the **Prepare Schedule** option and select *01/28/2022* as *Scheduling End Date*. Click on **OK**.

The Machine Scheduling Chart is posted. Click on the **Options** button in the tool bar and tick the **'Display Working Days only'** option.

8.6	Work Order Scheduling		

We schedule the operation of the first firm work order for item *SROD*. Click on this work order in the left panel list. The **Work Order Scheduling** window is posted.

Click on the **Schedule** button. The operation is scheduled i.e. Start date and End date have been calculated. Click on the **Close** button.

You can see that the work order operation has been placed on the chart. You can change time scale by the **Hours**, **Days**, **and Weeks** buttons.

8.7	Global Scheduling Process	**Scheduling** menu**, Finite Capacity Scheduling** option	

Now, we will schedule all firm orders.

Select: *Scheduling Type:* **Forward Scheduling,** *Work Order Sorting Criteria*: **Due Date**). Click on the **OK** button.

Click on the **Charts** button.

Select the **Work Orders** option under the **Schedule** button to see the position of the orders.

8.8	Due date analysis	**Scheduling** menu**, Work Order Due Date Analysis** option	

Some work orders can be late with respect to the due date (or in advance with respect to the due date). This function displays an analysis of work order delays.

What is the impact of an advance (positive slack) of a work order compared to its due date on the organization of production?

What is the impact of a delay (negative slack) of a work order compared to its due date on the organization of production?

Click on **Back**.

8.9	Workload Profile	**Scheduling** menu**,** option **Workload Profile**	

The workload profile of each work center associated to the schedule can be displayed. Select **Period: Days**.

Comment the capacity utilization of each work center.

8.10	Backward Scheduling	**Scheduling** menu**, Finite Capacity Scheduling** option	

Select: *Scheduling Type:* **Backward Scheduling,** *Work Order Sorting Criteria*: **Due Date**). Click on the **OK** button.

Click on the **Charts** button.

Select the **Work Orders** option under the **Schedule** button to see the position of the orders.

Click on the **Due Date Analysis** button. Comment the differences compared to the forward schedule.

Priority Scheduling

8.11	Priority Rule Scheduling	**Scheduling** menu**, Finite Capacity Scheduling** option	

Select: *Scheduling Type:* **Priority Scheduling,** *Priority Rule*: **Minimum Slack**. Click on the **OK** button.

Click on the **Charts** button.

Click on the **Due Date Analysis** button. Comment the differences compared to the forward schedule.

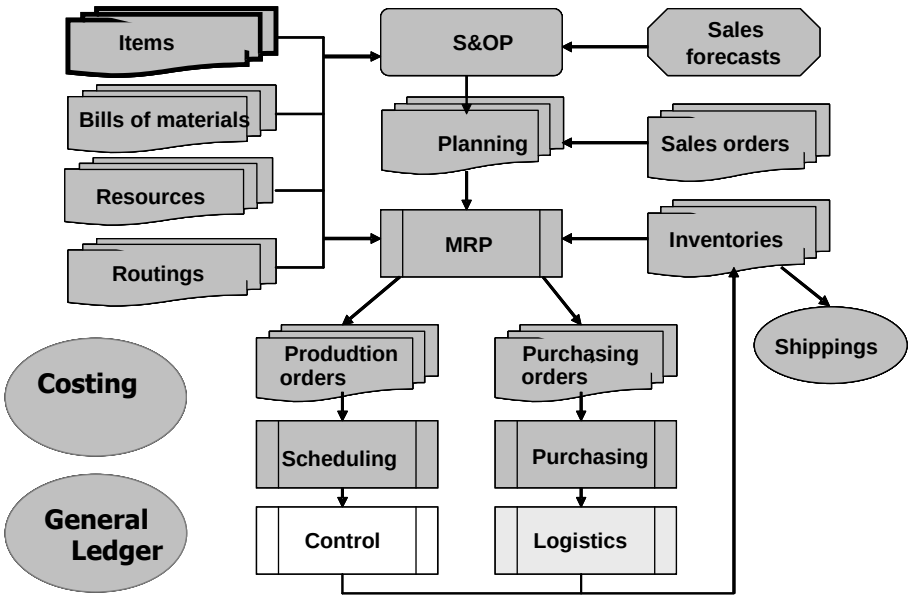
8.12	Resource Utilization	**Scheduling** menu**, Resource Capacity Utilization** option	

Select: *Start Date:* **01/17/2022,** *Periods*: **2 (weeks)**. Click on the **OK** button.

Comment the chart.

Click on the **Save Folder** button (**Administration** page).

Session 9:
Work Order Release and Production Activity Control



The scheduling obtained at Session 8 proposes a schedule for the realization of production orders. However, this is always a task planning, which should now be carried out physically. The gradual realization of the planned tasks and their follow-up is the objective of this session, broken down into two parts: the launching (or release) of firm work orders and the follow-up of the orders launched.

Save folder as ***Picaso09*** (**Administration** page)

Work Order Release [Scheduling]

A firm work order release consists in the following steps:

- required materials and components have to be reserved in the corresponding warehouses,
- the exact characteristics of the required operations have to be defined (according to the release routing),
- Start operations (with the planning defined by the detailed scheduling procedure).

9.1	Firm work order release	**Scheduling** menu**, Firm Work Order Maintenance** option	

Select the first firm work for item *SROD.*

The **Components** tab displays the required component list, and for each of them, the required quantity and the available quantity in inventory.

Click then on the **Release** button (and confirm the release) in order to release this firm work order.

9.2	Open Work Orders	**Control** menu**, Open Work Order Maintenance** option	

Examine then the open work order.

This page contains all information about this work order, such as the number of parts in progress, completed and available (as of the date of the information entry). It is noted that the standard times of realization of the various operations are displayed, as well as all the information available for this work order (via the **Operations**, **Components** and **Dates** tabs).

On the **Components** tab, explain the concept of reserved stock (RESV). Examine the line of the ROD40 component. Click the **Inv. Trans.** button.

The inventory of the item is presented. Select a row and click the **Transactions** button. Examine the corresponding movements by clicking the **OK** button.

9.3	Component Status	**Logistics** menu**, Inventory Inquiry per Item** option	

Select in the left panel list the component of the work order: ROD40 .

Required components have been reserved in their warehouses. Their status is changed from AVAI (Available) to RESV (Reserved).

9.4	Open Work Orders Components Issues	**Control** menu**, Open Work Order Maintenance** option	

Recall the open order and click on the **Component Issue** button.

On the **Work Order Component Issue** page, you can see the component list. As all the components are available, click on the **OK** button.

Click on the **Back** button.

Explain the data on the **Components** tab.

The issued components are recorded as work-in-process, as it can be displayed with the **In Process Inventory** list **(Logistics** menu).

9.5	Shortage analysis	**Scheduling** menu**, Component Shortage Analysis** option	

As it is necessary to check availability of the required components before the release of a firm work order, the **Component Shortage Analysis** function provides a global analysis for all the firm work orders. Comment the list.

9.6	Mass Work Orders Release	**Scheduling** menu**, Automatic Work Orders Release** option	

An automatic procedure permits the user to release all the work orders until a given horizon. Select *01/21/2022* as *Release End Date*.

Validate by the **OK** button.

Comment the report.

9.7	Open Work Orders Schedule	**Scheduling** menu**, Finite Capacity Scheduling** option	

The open work orders need to be rescheduled.

Select: *Scheduling Type:* **Forward Scheduling,** *Work Order sorting criteria*: **Due Date**). Click on the **OK** button.

Click on the **Charts** button.

9.8	Component Issue	**Control** menu**, Work Order Component Issue** option	

Select successively all the open work order in the left panel list.

The component list us displayed. Click on the **OK** button to record the component issue.

Production Reporting [Control]

Production reporting consists in recording the actual time consumption and components consumption corresponding to the physical production of the open work orders.

9.9	Production reporting for a work order	**Control** menu**, Open Work Order Maintenance** option	

Select the first open work order related to item *BP100* .

Display the operation by clicking on the **Operations** button (or click on the operation line).

On the **Work Order Operation Maintenance** page, select the **Control** tab. Comment.

Click on **Reporting** button.

On the **Production Reporting** page, enter the values as follows:

We report Setup first:

- Activity: select 10 in the drop-down list (Setup) or click on the Setup button
- Times used:
    - Machine: equal *Standard Time*

Validate by clicking on the **OK** button and confirm.

Then we report Production:

- Activity: 00 in the drop-down list (Production) or click on the Production button)
- Quantity Good: equal *Quantity to process*
- Times used:
    - Machine: equal *Standard Time*

Validate by clicking on the **OK** button and confirm.

The Operation status is changed to ***Closed*** and the Work Order status is changed to ***Completed***.

Click on the **Back** button. The **Work Order Operation Maintenance** page – **Control tab** – displays the current state of the operation.

Click on the **Back** button. On the **Operation page**, the status is *Closed*.

Click again on the **Back** button. On the **Open Work Order** page, the status is *Completed*, and there is a quantity of goods in the work shop.

9.10	Work Order Receipt Into Warehouse		

Click on **Receipt** button in order to transfer the completed items into the physical warehouse.

Validate the receipt by clicking on the **OK** button.

Click on the **Back** button.

9.11	Work Order Closing		

Click on **WO Closing** button in order to close the completed work order and confirm.

The work order is removed from the Open Work Order List and can be found in the **Closed Work Order List** (**Control** menu).

9.12	Reporting all open orders	**Control** menu**, Open Work Order Maintenance** option	

Select each **Open Work Order** in the list and follow the same process.

Warning: the last three orders have two operations.

After the first operation is fully reported (setup and production), select in the operation drop-down list the second operation and record the report.

9.13	Change the current date	**Administration** page	

Set the folder date at *01/21/2022* on the **Administration** page.

9.14	Component Availability Analysis	**Scheduling** menu**, Component Shortage Analysis** option	

We can see that now several orders can be released.

Select an order which can be released and click in the **Release** button.

9.15	Component Issue	**Control** menu**, Work Order Component Issue** option	

Select successively all the open work order in the left panel list.

The component list us displayed. Click on the **OK** button to record the component issue.

9.16	Reporting all open orders	**Control** menu**, Production Reporting** option	

Select each **Open Work Order** in the list and the operation in the drop-down list. Follow the same process for reporting operations.

As it is only assembly operations, there is no setup.

You must select the machine in the drop-down list.

9.17	Receipt of open orders	**Control** menu**, Work Order Receipt** option	

The two work orders are completed. Select each of them in the list and click on **OK**. The items are now available.

9.18	Closing all open orders	**Control** menu**, Open Work Order Maintenance** option	

Select each **Open Work Order** in the list and click on the **WO Closing** button.

9.19	Change the current date	**Administration** page	

Set the folder date at *01/24/2022* on the **Administration** page.

9.20	Reporting all open orders	**Scheduling** menu**, Component Shortage Analysis** option	

We can see that now several orders can be released.

Select an order which can be released and click in the **Release** button.

9.21	Component Issue	**Control** menu**, Work Order Component Issue** option	

Select successively all the open work order in the left panel list.

The component list us displayed. Click on the **OK** button to record the component issue.

9.22	Reporting all open orders	**Control** menu**, Production Reporting** option	

Select each **Open Work Order** in the list and the operation in the drop-down list. Follow the same process for reporting operations.

Note: it is an assembly operation: the no setup.

Warning: Select the machine in the drop down-list.

9.23	Receiving goods	**Control** menu**, Work Order Receipt** option	

The two work orders are completed. Select each of them in the list and click on **OK**.

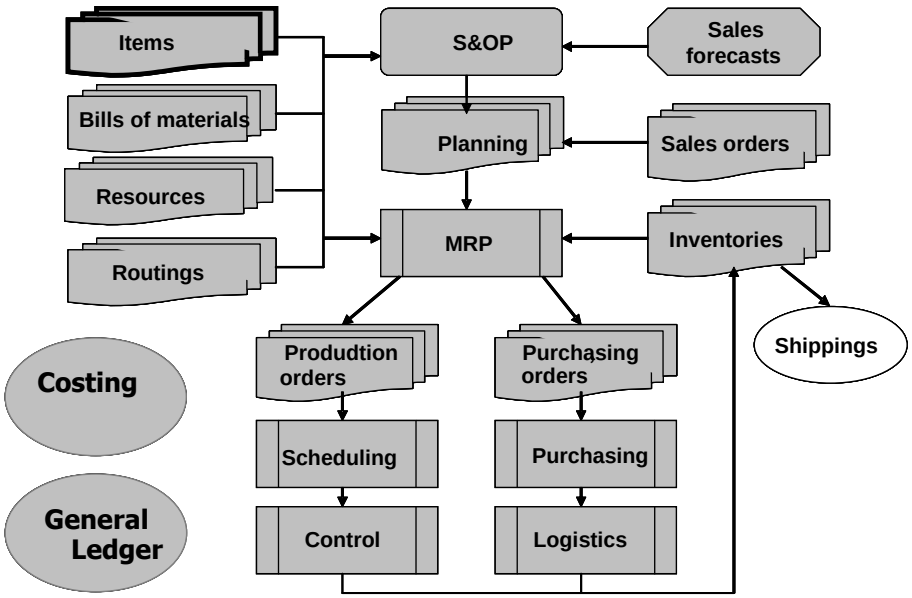
9.24	Closing all open orders	**Control** menu**, Open Work Order Maintenance** option	

Select each **Open Work Order** in the list and click on the **WO Closing** button.

Post **Closed Work Order List** (**Control** menu).

Click on the **Save Folder** button (**Administration** page).

Session 10:
Sales Order Shipping



After completion of the manufacturing, we can now proceed with the shipment of the orders that the customers have honored us with. This happens in two phases: creation of a preparation slip by the commercial and then shipment by the logistics department.

Save folder as ***Picaso10*** (**Administration** page)

Sales Order Preparation [Sales]

10.1	Sales Order Preparation	**Sales** menu**, Sales Order Preparation** option	

Select the first sales order in the list.

The order lines are displayed. Validate the preparation by clicking in the **OK** button. Preparation Note is issued and sent to the Logistics department. The order should be prepared.

Do the same for the second sales order.

Sales Order Shipping [Logistics]

10.2	Sales Order Shipping	**Logistics** menu**, Sales Order Shipping** option	

Select the **warehouse** *FGW* and the first preparation note.

The order lines are displayed. Validate the shipment by clicking on the **OK** button. The order is now closed.

Do the same for the second preparation note.

10.3	Inventory	**Logistics** menu**, Inventory Inquiry per Item** option	

The corresponding inventory levels for the received items can be displayed. Select item *BC100.*

The list of inventory transactions can be displayed by clicking on a line.

If the AR&AP function is enabled, we can now proceed to the invoicing of shipments.

Customer Invoice [AR&AP]

10.4	Customer Invoice	**AR&AP** menu**, Customer Invoicing** option	

As orders are shipped, they must now be invoiced.

Click on the **New** button. Select the customer *CUSTA*. The list of shipments is displayed.

The maturity date and amounts are calculated.

Validate by clicking on the **OK** button.

Click on the **New** button to prepare the invoice for *CUSTB.*

10.5	Customer Invoice	**AR&AP** menu**, Accounts Receivable Inquiry** option	

Select the customer *CUSTA*. The list of invoices is displayed.

10.6	Customer Invoice	**AR&AP** menu**, Accounts Receivable Balance** option	

Select the customer *CUSTA*. The list of invoices is displayed.

Payments [AR&AP]

10.7	Change the current date	**Administration** page	

Set the folder date at *02/28/2022* on the **Administration** page.

10.8	Customer Invoice	**AR&AP** menu**, Customer Payments** option	

Click on the **New** button. The list of customers is displayed on the left panel. Select customer *CUSTA*.

The list of its invoices is posted in the grid.

Enter the payment amount equal to the total amount of the invoice.

Select **CHK** as Payment Mode.

Click in the '**Matching'** column to note that the invoice is paid.

Validate by clicking on the **OK** button.

Click on the **New** button to record the payment of *CUSTB*.

10.9	Customer Invoice	**AR&AP** menu**, Accounts Receivable Inquiry** option	

Select the customer *CUSTA*. The list of invoices and payments is displayed.

10.10	Vendor payment	**AR&AP** menu**, Vendor Payment Entry** option	

Click on the **New** button. The list of vendor invoices is displayed on the left panel. Select the first invoice.

The list of its invoices is posted in the grid.

Enter the payment amount equal to the total amount of the invoice.

Select **CHK** as Payment Mode.

Click in the '**Matching'** column to note that the invoice is paid.

Validate by clicking on the **OK** button.

10.11	Customer Invoice	**AR&AP** menu**, Accounts Payable Inquiry** option	

Select the vendor *SUPPLY*. The list of invoices and payments is displayed.

Click on the **Save Folder** button (**Administration** page).

We have completed the planning and control cycle of this very basic case.

Thank you for your attention.