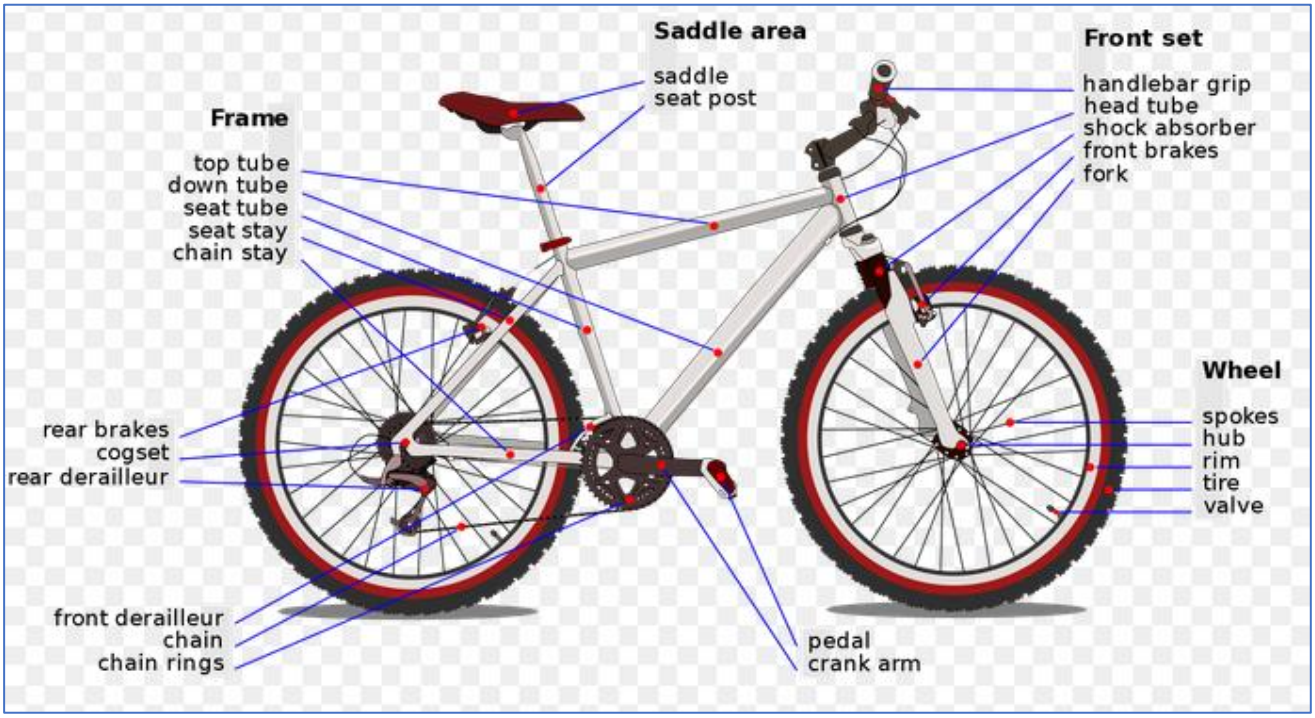
FIT3138 Real Time Enterprise Systems

Worksheet 02

Material Master Management



Version 2022.00

Scenario

Global Bikes Inc (GBI) was founded in 2001 following the merger of two bicycle manufacturers, one based in the US and the other in Germany. GBI has three lines of business: deluxe and professional touring bikes, men's and women's off-road bikes, and bike accessories. GBI sells its bikes to a network of specialized dealers throughout the world, and it procures its raw materials from a variety of suppliers globally.
GBI has two manufacturing facilities, one in the US and one in Germany. It also has three additional warehouses, two in the US and one in Germany.
GBI has more than 100 employees globally. The organization uses SAP ERP to support its processes. The company has a new bicycle for sale- Mongoose Mountain Bike. This bicycle (material) needs to be created in the system. As part of this process a Bill of Material needs to be created to assist in the material requirements in the production of the bicycle.

Organisational Units

During the implementation of SAP R/3 once the business **processes** to be implemented are determined the next stage is to define the **organisational units. Organisational units** are areas of the company where various **business processes** are implemented. Different processes can use different organisational units. The organisational units used in **Production Planning** are **Client**, **Company Code**, **Plant** and **Storage Location**.

Company Code

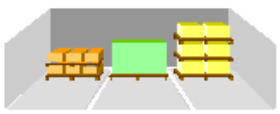
A **company code** is an independent accounting unit. Balance sheet and profit and loss statements that are required by law are created at the company code level. In our scenario the **company code** will be US00.

Plant

A **plant** produces goods, renders services or makes goods available for distribution. It has attributes such as:

- Address
- Language
- Country
- Workday calendar

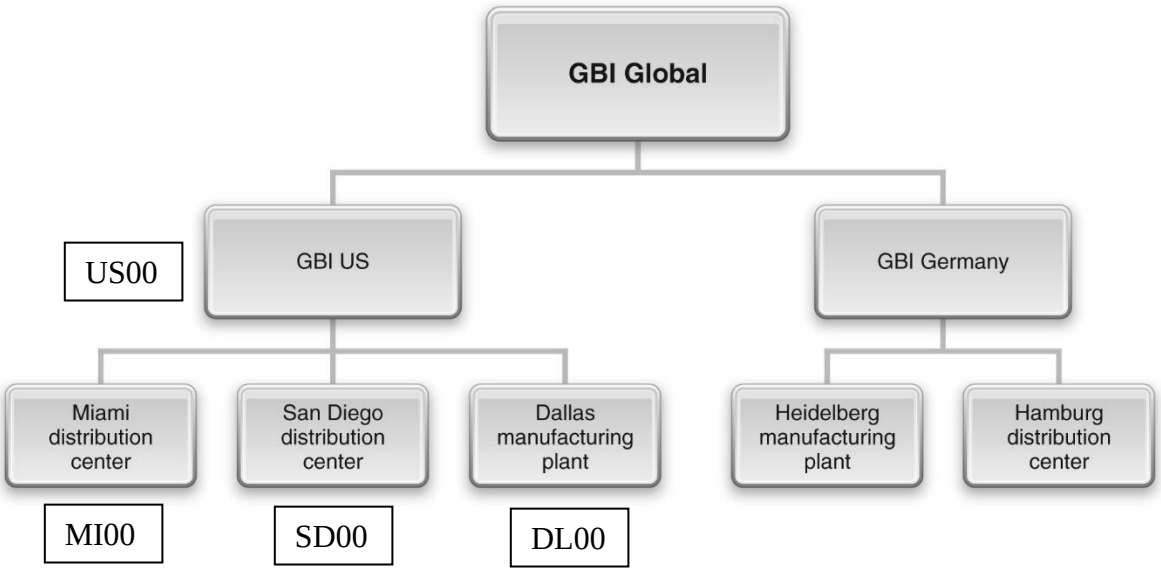
In our scenario the **plant** will be identified by DL00.



Storage Location

A **storage location** defines where **materials** are stored. A **plant** could have more than one **storage location**. The **storage locations** in our scenario is FG00.

A summary of the organisational units used in our scenario are illustrated below.



PROCESS OVERVIEW

Material Master

The **Material Master** contains all the information on all the material that a company procures, produces, stores and sells. It is used by all of the **Logistics** components in the R/3 System such as purchasing, inventory management, materials planning, invoice verification, and so on.

Information stored in the **Material Master** can describe the component as well as how it should be treated in the business processes. Materials with similar basic attributes are grouped together by **material type**. This means you can manage your materials according to their business requirements.

Creating Material Master records

You are going to define a new *Finished Product*, The **Mongoose Mountain Bike** with item code **ORMG1###** (Where ### your SAP user id.). It is made from the following list of subassemblies (semi-finished products) and raw materials (**These materials already exist in S/4HANA)**:

Item Code	Material Description	Material Type
ORWA1###	Wheel Assembly	Semi-Finished Product
OFFR1###	Frame	Semi-Finished Product
DGAM1###	Gear Assembly	Semi Finished Product
ORTR1###	Tire	Raw Material
ORTB1###	Tube	Raw Material
ORWH1###	Aluminium Wheel	Raw Material
HXNT1###	Hex Nut	Raw Material
LWSH1###	Lock Washer	Raw Material
BOLT1###	Socket Head Bolt	Raw Material

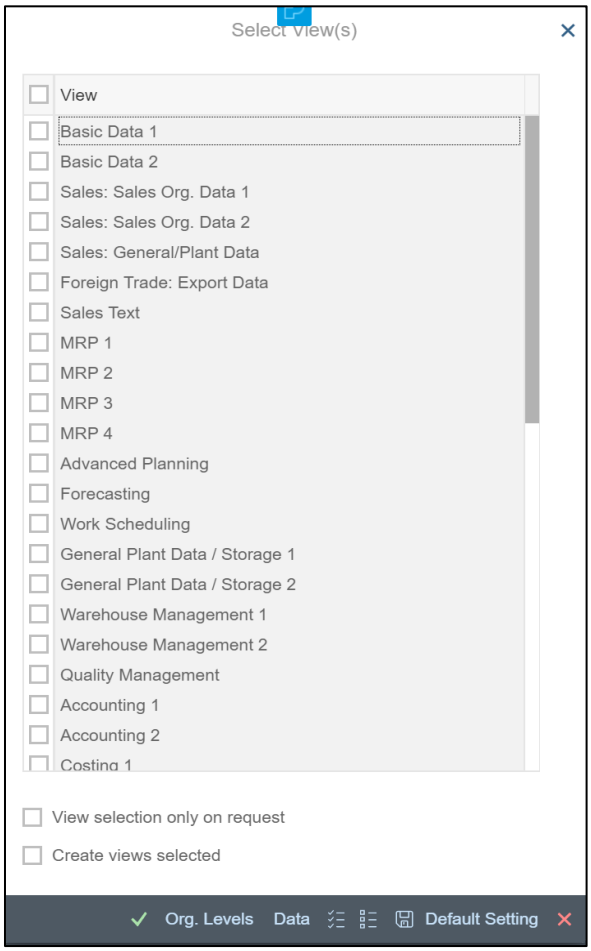
You need to create the Material Master record for the Mongoose bike.

Please Note: The SAP system is configured to use the European notation for representing numbers. E.g 1,234,567.89 will appear as 1.234.567,89

1. Click Materials Management on the **Group Selection** toolbar to display the apps.
2. Click Create Material Fiori tile to open this App.
3. Type *ORMG1###* (where ### is your logon) in the **Material** field.
4. Select Mechanical Engineering in the **Industry Sector** field.
5. Select Finished Product in the **Material Type** field

You now need to edit (maintain) the functional Views. The information stored in the Material Master record is divided into different Views so that a user can request to look at only the information that is of interest to him/her. Each user department has its own View of a Material Master record. For example, data that relates to the accounting department is stored in the Accounting View and data that relates to material planning is stored in the MRP View.

6. Click Select View(s) to display the various Views of the Material Master.

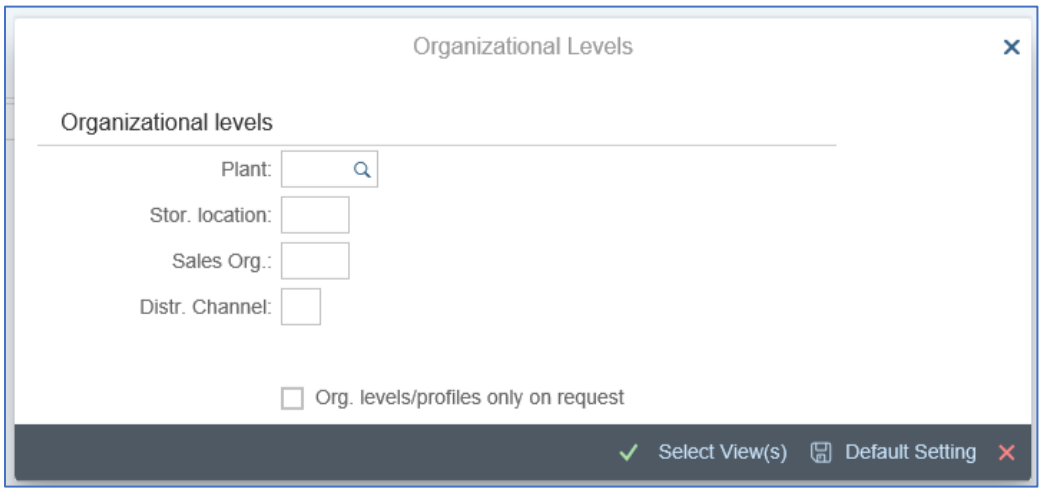


The Views which need to be created are:

- Basic Data 1
- Sales: Sales Org Data 1
- Sales: Sales Org Data 2
- Sales: General / Plant Data
- General Plant Data / Storage 1
- Accounting 1

7. Click  next to Basic Data 1 to select this View.
8. Repeat the process for the Views above to select them.
9. Click on “Create Views Selected”
10. Click  to create the Views.

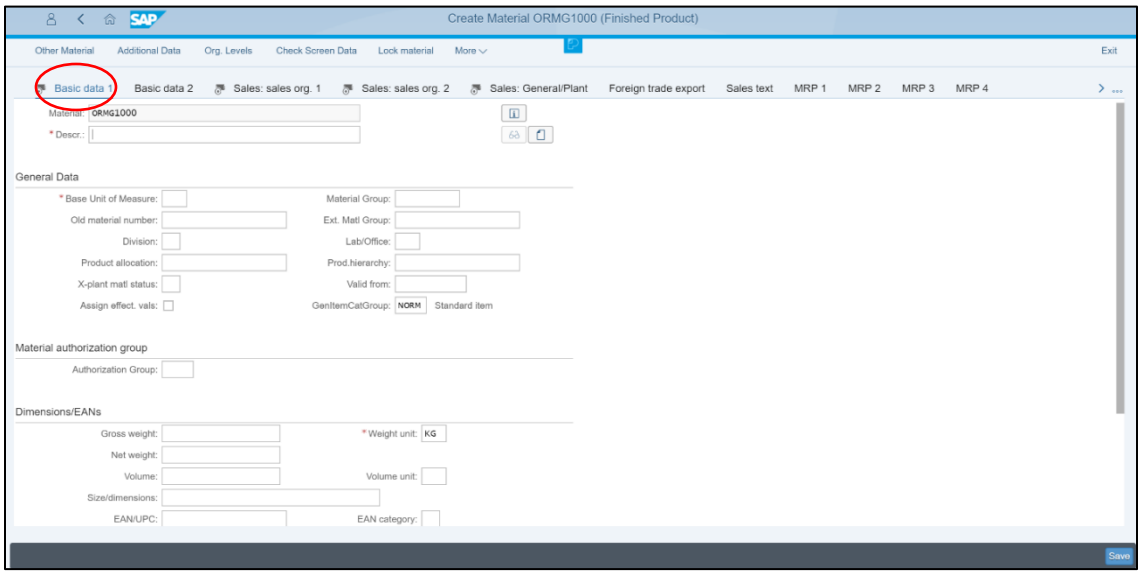
The “Organizational Levels” window is displayed.



The Basic data View of this Material is applicable to all organisational units where this Bicycle is sold. However sales data may vary from unit to unit therefore data to be maintained is organisational specific. You need to specify which organizational units you are referring to.

11. Select DL00 (Dallas) in the **Plant:** field.
12. Select FG00 (Finished Goods) in the **Storage location** field
13. Select UE00 (US East) in the **Sales Org:** field.
14. Select WH (Wholesale) in the **Distr. Channel** field.
15. Click  or press Enter.

The following screen appears. Notice that the Basic Data 1 View is displayed.



16. Type *Mongoose Mountain Bike ###* (where ### is your logon) in the **Descr:** field.
17. Type *EA* (Each) in the ***Base Unit of Measure:** field.
18. Select Bikes (Finished Bicycles) in the **Material Group:** field.
19. Select BI (Bicycles) in the **Division:** field.
20. Select 001 (Laboratory 1) in the **Lab/Office:** field.
21. Type *8000* in the **Gross Weight:** field.
22. Type *8000* in the **Net Weight:** field.
23. Select G (Grams) in the ***Weight unit** field.

You have now entered all the data required for the Basic data 1 View. The next View to be maintained is the Sales: sales org 1.

24. Click 

to move to this View.

Note that the additional fields which are organizational unit specific appear on the screen.

25. Select 0 (Exempt) in the **…** (Tax Classification) field for EACH of the three Tax Classifications.

You now need to maintain the Sales: General Plant View.

26. Click 

to display this View.

Notice that the organizational unit (Plant Dallas) now appears on the screen as we specified this previously.

27. Select 02 (Individ requirements) in the **Availability check:** field.

28. Select 0001 (On palettes) in the **Trans. Grp:** field.
29. Select 0002 (Hand lift) in the **Loading grp:** field.

The final View you are going to maintain at the moment is the *Accounting 1* view. You will notice that it does not appear on the View toolbar. You can display all Views by clicking  .

30. Click to display the Views.
31. Click Accounting 1 to select this View. You may have to scroll down.
32. Select 7920 (Finished Product) in the **Valuation Class:** field.
33. Type *1500* in the **Standard Price:** field.
34. Select S (Standard) in the ***Prc Ctrl:** field.

You have now entered required data. You now need to save the Material Master.

35. Click  .
    If you receive a warning message relating to currency conversion , *Save* again.

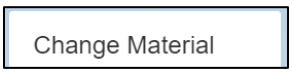
A message appears at the bottom of the screen confirming the creation of your new material. If there is no message, the material has not been created!

✍ Record the Material Number

36. Click  to return to the Launchpad.
    Ignore any messages relating to unsaved data.

Changing Material Master records.

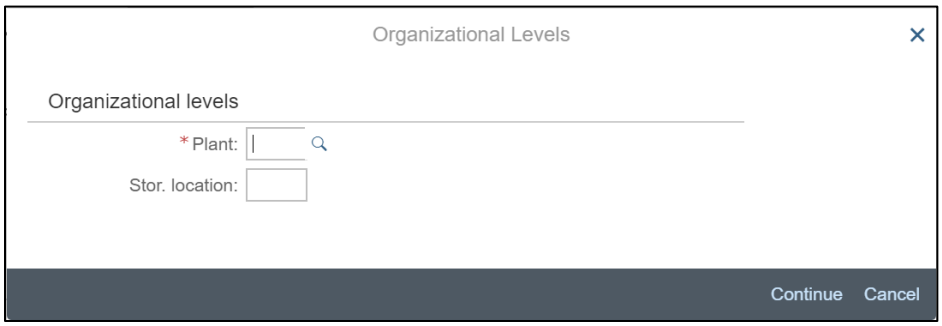
You need to make a change to one of the existing *Semi-Finished Products*, the Off Road Wheel Assembly (ORWA1###).
Note: This is **NOT** the Finished Product that you have just created.

37. Click  on the **Group Selection** toolbar to display the apps.
38. Click  Fiori tile to open this App.
39. Type ORWA1### (where ### is your logon) in the ***Material** field.
40. Click  .

The Select Views dialog screen appears.

41. Click  associated with the following views to select them:
    - **Basic Data 1**
    - **MRP 1**
    - **General Plant Data/Storage 1**
42. Click  to display these Views.

The Organisation Level dialog screen appears:



43. Type *DL00* (Dallas) in the **Plant** field.

    Click  or press Enter.
44. Click "MRP1" on the View toolbar to display this view.

You are going to change the ABC Indicator field. The ABC Indicator classifies a material as an A, B, or C part according to its consumption value. This classification process is known as the ABC analysis. Based on this indicator different planning activities can be performed.
The three indicators have the following meanings:

- A - important part, high consumption value
- B - less important part, medium consumption value
- C - relatively unimportant part, low consumption value

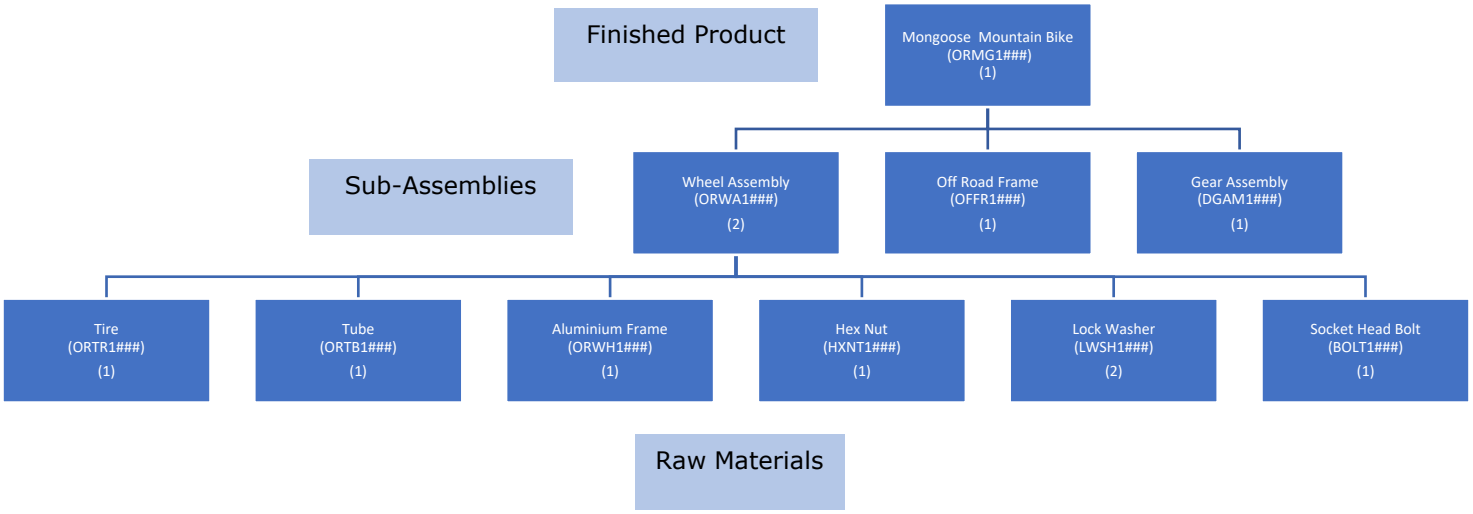
45. Type *B* in the **ABC Indicator** field.
46. Click  .
47. Click  to return to the Launchpad.

Creating Bill of Materials (BOM)

The **BOM** is a complete formally structured list of components that make up a product or assembly. The list contains the item number of each component together with the quantity and unit of measure. It creates the relationships between an assembly and all of its direct components

The structure of the bicycle can be represented using a **Bill-of-Material**.

The **BOM** for the **Mongoose Mountain Bike** can be represented as follows:



This **BOM** shows how the bicycle is assembled from different materials. For example, The Mongoose Mountain Bike (ORMG1###) requires 2 Wheel Assembly (ORWA1###) sub-assemblies. Each Wheel Assembly (ORWA1###) is made up of 6 different raw materials -Tire, Tube, Aluminium Frame, Hex Nut, Lock Washer, Socket Head Bolt. Each component has its own material master.

To create the **Bill of Materials** for your Mongoose Mountain Bike you will define the BOM for the finished product. **The BOMs for the subassemblies have already been defined**.

46. Click 

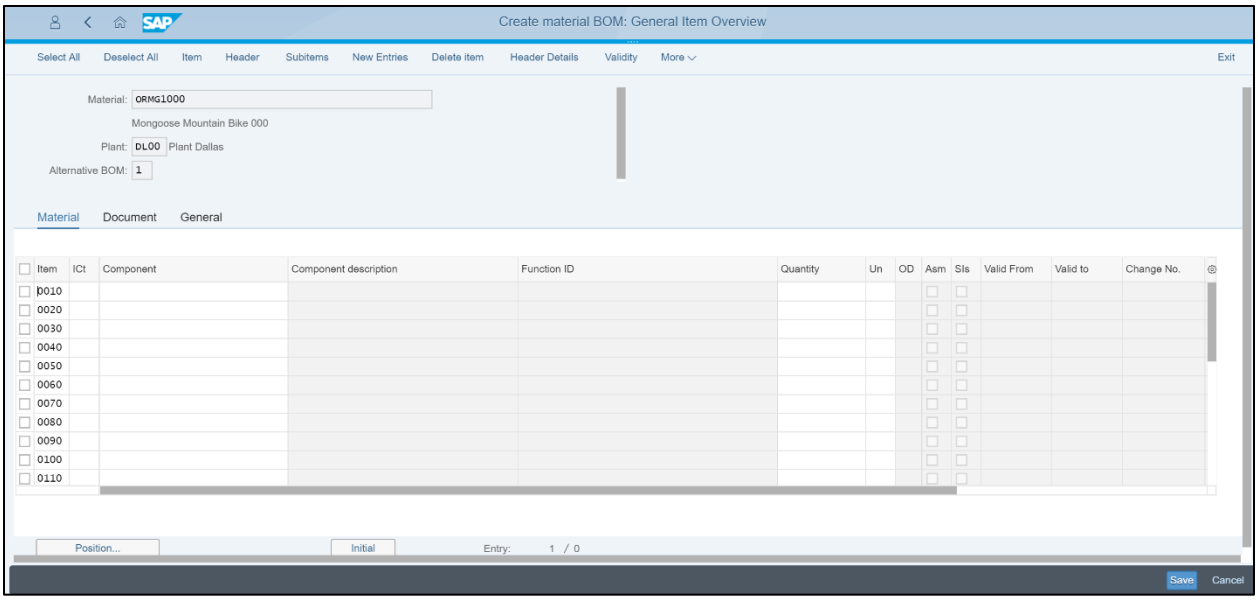
in the *Controlling* Group to open this App.
47. Type *ORMG1###* (where ### is your logon) in the ***Material:** field.

A material can have different BOMs depending on what the BOM is going to be used for. For example the BOM for Production could be different for that for Plant Maintenance or Sales. Also BOMs can vary between Plants. You need to specify the BOM usage and Plant for the BOM you are creating.

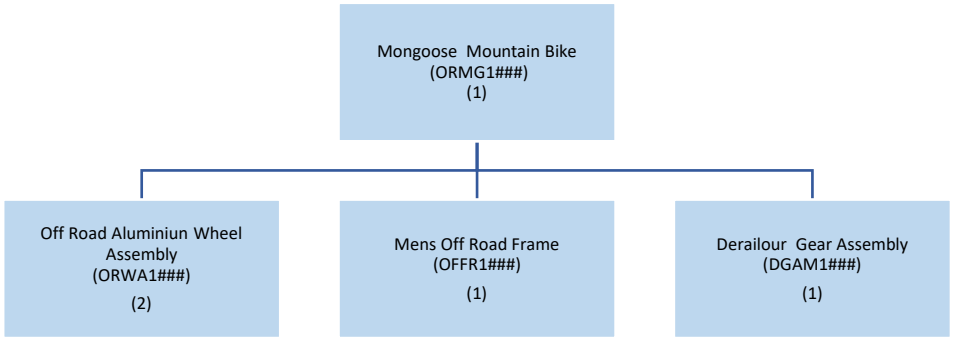
48. Type *DL00* (Dallas) in the **Plant** field.

49. Type *1* (production) in the ***BOM Usage:** field.

50. Press <ENTER> to display the Create material BOM screen.



You are going to create the following BOM:

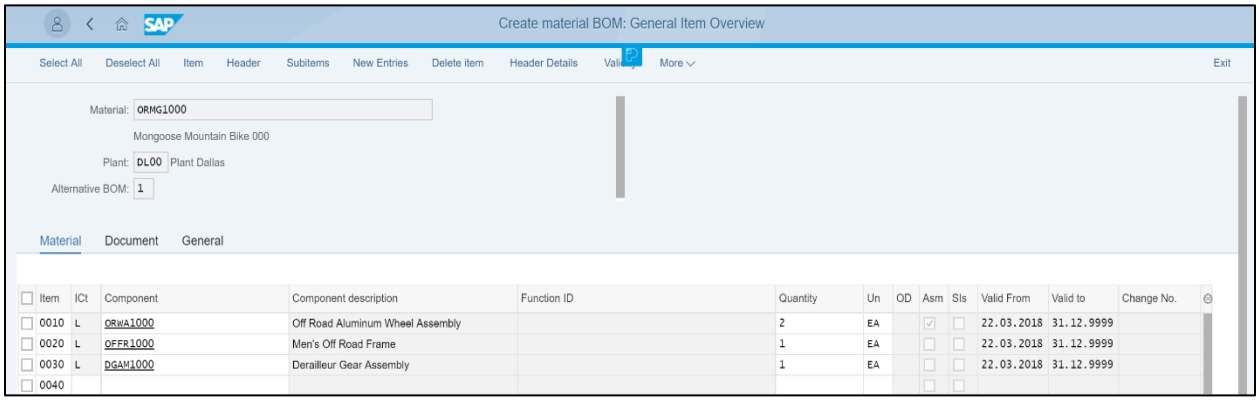


51. Type The following data:

Item	Item Category (ICt)	Component	Quantity
0010	L (Stock item)	ORWA1### (where ### is your logon)	2
0020	L (Stock item)	OFFR1### (where ### is your logon)	1
0030	L (Stock item)	DGAM1### (where ### is your logon)	1

52. Press **<ENTER>** to display the component description, unit of measure and other data.

Your screen should appear similar to below:



53. Click Save.

A message appears confirming the creation of the BOM.

54. Click to return to the Launchpad.

✍ You have created the BOM for the Mongoose Mountain Bike. Why didn't you have to create a BOM for the Wheel Assembly? How would Production know what makes up the Wheel Assembly?

Displaying Sub Assembly BOM

The answer to the above question is that the BOM for the Wheel Assembly had already been created. The system know that when a Wheel Assembly is required then the BOM for the Wheel Assembly is automatically applied. Therefore, a BOM can be made up of many other BOMs. To display a BOM:

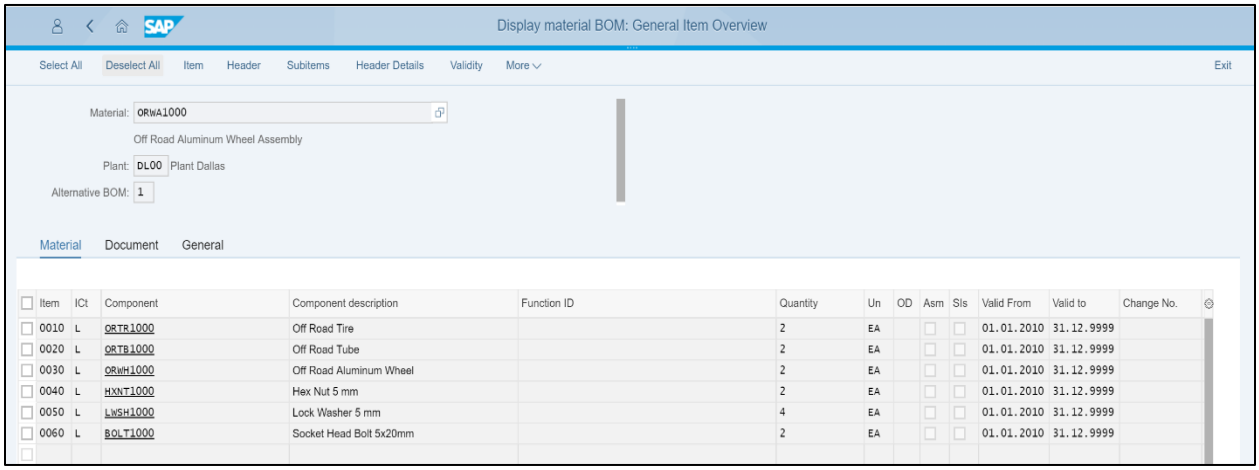
55. Click Display Bill of Material in the Controlling Group.
56. Type *ORMG1###* (where ### is your logon) in the ***Material:** field.
57. Type *DL00* (Dallas) in the **Plant** field.
58. Type *1* (production) in the ***BOM Usage:** field.
59. Press **<ENTER>** to display the Display material BOM screen.

Your BOM appears on screen. From this screen you can view the BOM of a sub assembly if it exists.

60. Click of the Off Road Aluminum Wheel Assembly item to select it.
61. Click More to display the menu.
62. Choose Extras ➔Display Assembly to display a dialog screen.

63. Click Continue.

The BOM for the Off Road Aluminum Wheel Assembly now appears on the screen. As mentioned this BOM had been created previously as it might be used in the BOMs of other bikes.



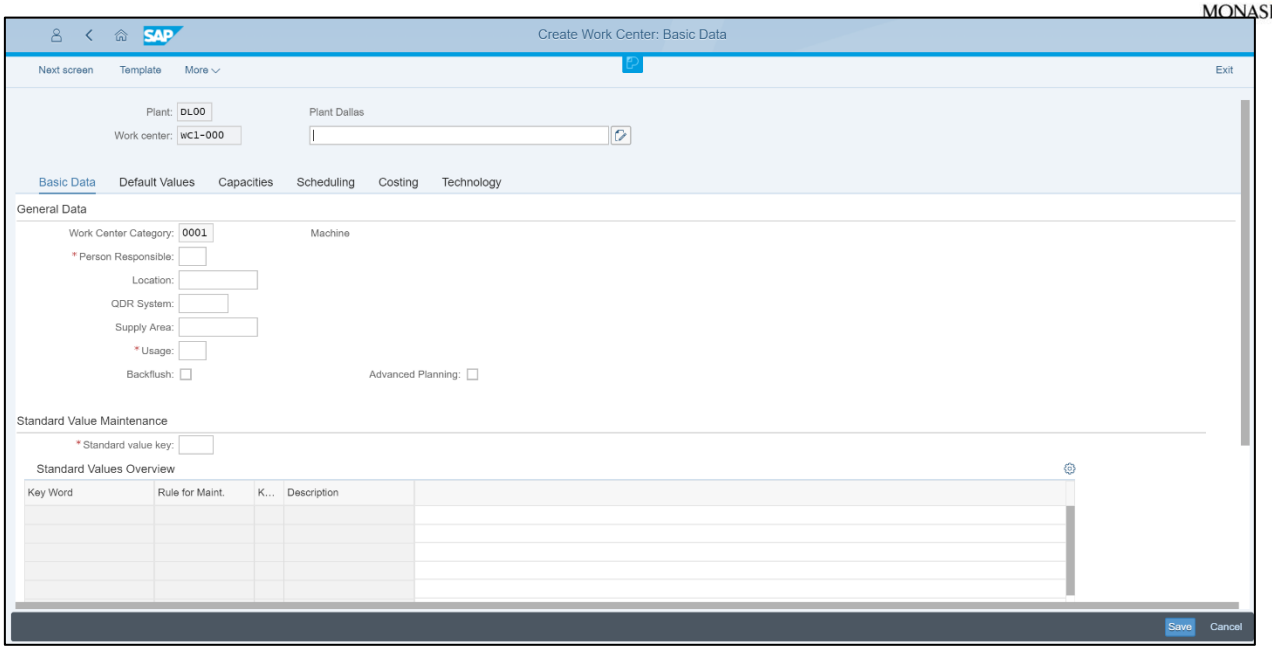
64. Click  to return to the Launchpad.

Work Centers

Now that you have defined the materials (BOM) to be used in making the Mongoose Mountain Bike, you need to define the location in the plant in which the manufacturing processes take place. Work Centers are the master data which represent real machines, Production Lines, Assembly Work Center, etc. Manufacturing activity or Operations are carried out at a Work Center. In the case study there are 4 Work Centers involved in the production of your bike. These are Assembly, Turning, Painting and Testing. To create a work center:

65. Click Create Work Center in the Production Planning and Execution Group.
66. Type DL00 (Dallas) in the ***Plant** field.
67. Type WC1-### (where ### is your logon) in the **Work Center**: field.
68. Select 0001 (Machine) in the **Work Center Category:** field.
69. Click Next screen

The Create Work Center: Basic Data screen appears:



70. Type *Assembly* as the work center description (where cursor is flashing).
71. Type *000* (Steve Barton) in the **Person Responsible:** field.
72. Type 001 (only routings) in the ***Usage:** field.
73. Type *SAP1* (Normal production) in the **Standard value key:** field.
74. Click Costing to move to this screen.
75. Type *NAPR1000* in the ***Cost Centre:** field.

Notice on this screen you can specify the costs associated with setup, Machine and labour for this Work Center. You could also specify the capacity of each Work Center. This assists the system to plan the production of the material.

76. Click Save.

A dialog screen appears to confirm the Work Center creation.

✍ Record your Work Center number. _____

You now need to create the remaining Work Centers.

77. Repeat this process for the remaining three work centres. In all cases use the same data as for WC1 and the following descriptions:

Work Centre	Description
WC2-###	Turning
WC3-###	Painting
WC4-###	Testing

78. Click  to return to the Launchpad.

You have now created the Work Centers for the production of the Mongoose Mountain Bike. As mentioned previously this is where the different work activities take place in a Plant. You now need to specify the sequence in which the Work Centers are utilisied. This is referred to as the Routings.

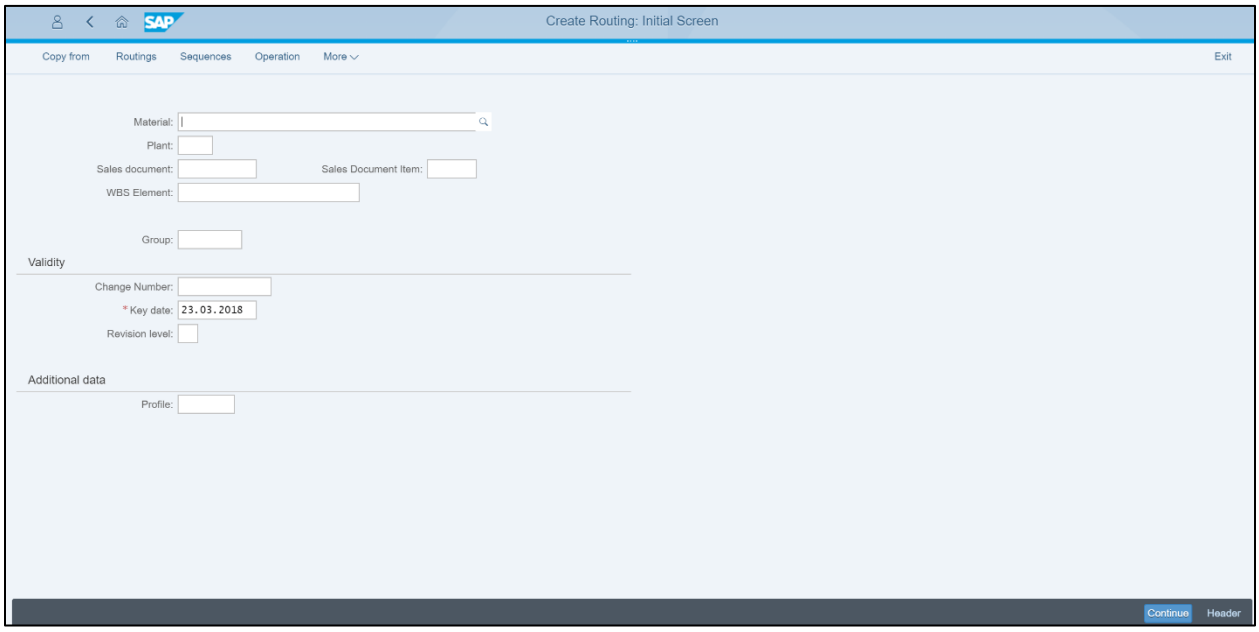
Routings

A routing is a description of which operations or list of activities has to be carried out during the production and planning process. It also tells what order or sequence the activities/operations needs to be carried out at work centers or machines. There may be several alternative routings for a product.

79. Click 

in the Production Planning and Execution Group.

The Create Routing screen appears:



80. Type *ORMG1###* (where ### is your logon) (Mongoose Mountain Bike) in the **Material**: field.
81. Type *DL00* (Dallas) in the **Plant:** field.
82. Click 

to display the Header screen.
83. Type *1* (Production) in the **Usage:** field.

84. Type *3* (Released for Costing) in the **Overall Status:** field.

You now need to specify the order of operations.

85. Click Operation to display this screen.
86. Type the following details for each operation:
87.

Operation	Work Center	Control	Description
0010	WC1-###	PP01	Assemble Raw Materials
0020	WC2-###	PP01	Final Assembly
0030	WC3-###	PP01	Paint
0040	WC4-###	PP01	Final Test

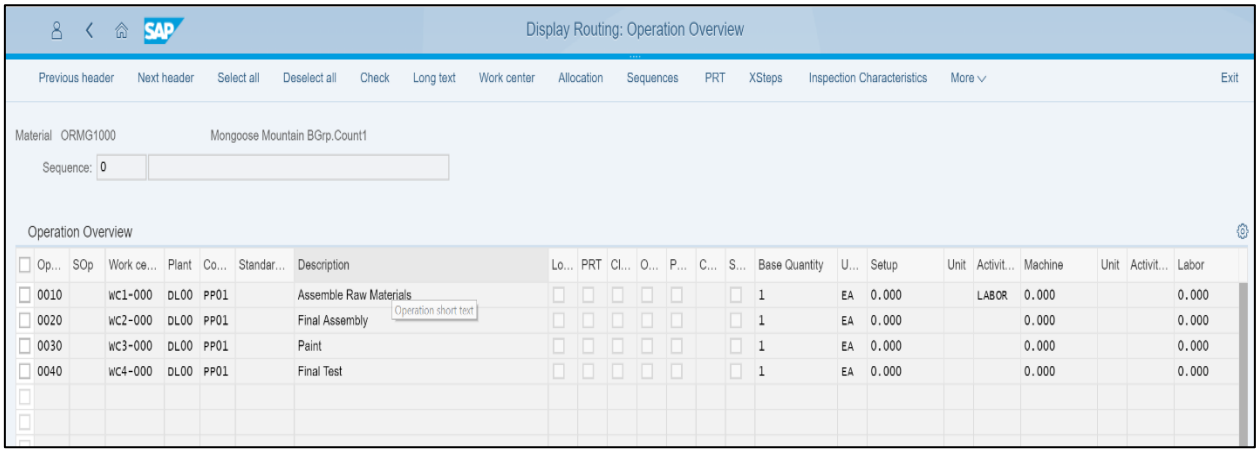
88. Click Save.

Display Routing

You can display the routing and associated dependencies.

89. Click  to return to the Launchpad.
90. Click Display Routing.
91. Type ORMG1### in the Materials: field
92. Type DL00 (Dallas) in the Plant: field.
93. Click Continue.

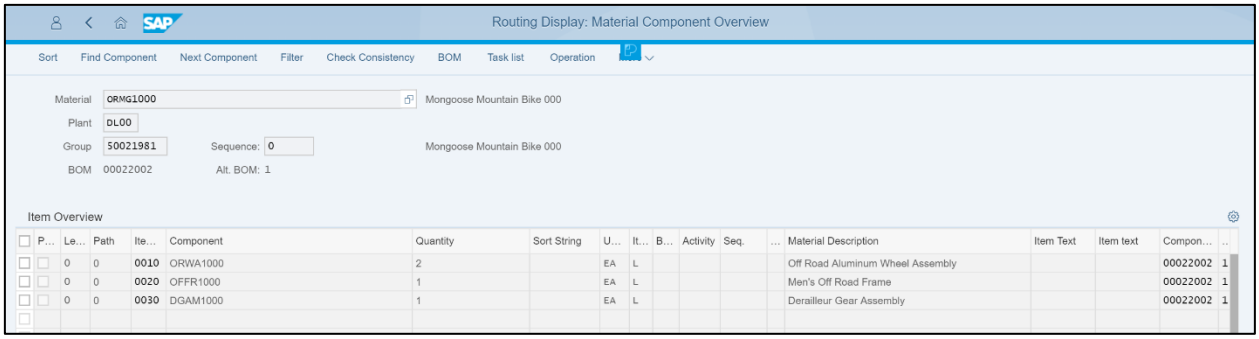
Your Routing appears on the screen:



From this screen you can view the required materials.

94. Click ☐ for Oper… 0010 to select this item.

95. Click Allocation to view the required materials.



✍ How did the system know to display this information?

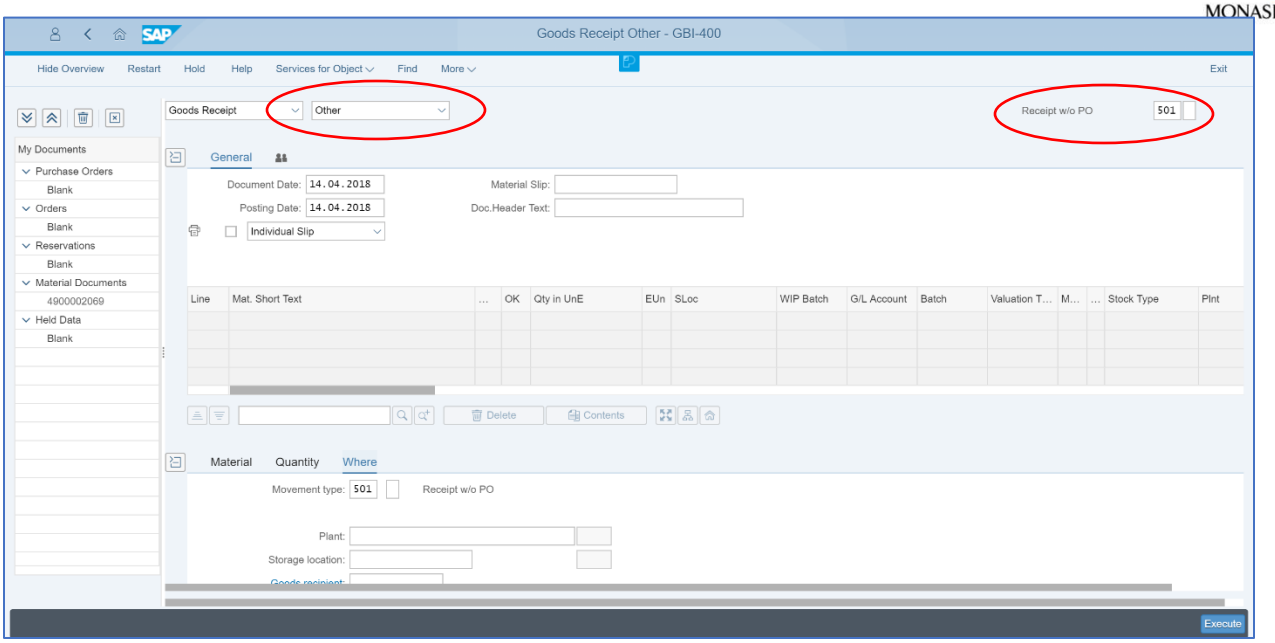
Add Initial Stock

Normally once the Material design and BOM had been finalised materials would be procured to produce the bike. At the moment the production execution process is outside the scope of this tutorial. However we will assume the production process has been completed and the completed bicycles need to be added to stock to be available for sales. To add stock to inventory:

96. Click 🏠 to return to the Launchpad.

97. Click Post Goods Movement in the Production Planning & Execution Group

A screen similar to the one below appears:



98. Select *Other* in the reference document field

99. Type 561 (Receipt per entry of stock balances for unresticted use) in **Receipt w/o PO** field. (It may have a different label)

100. Click Material to enter the material details.

If it is not visible, click on Detail data

101. Type *ORMG1###* (where ### is your logon) in the **Material** field.

102. Click Quantity to move to this screen.

103. Type *10* in the **Qty in Unit of Entry field**.

104. Click Where to indicate where the stock will be stored.

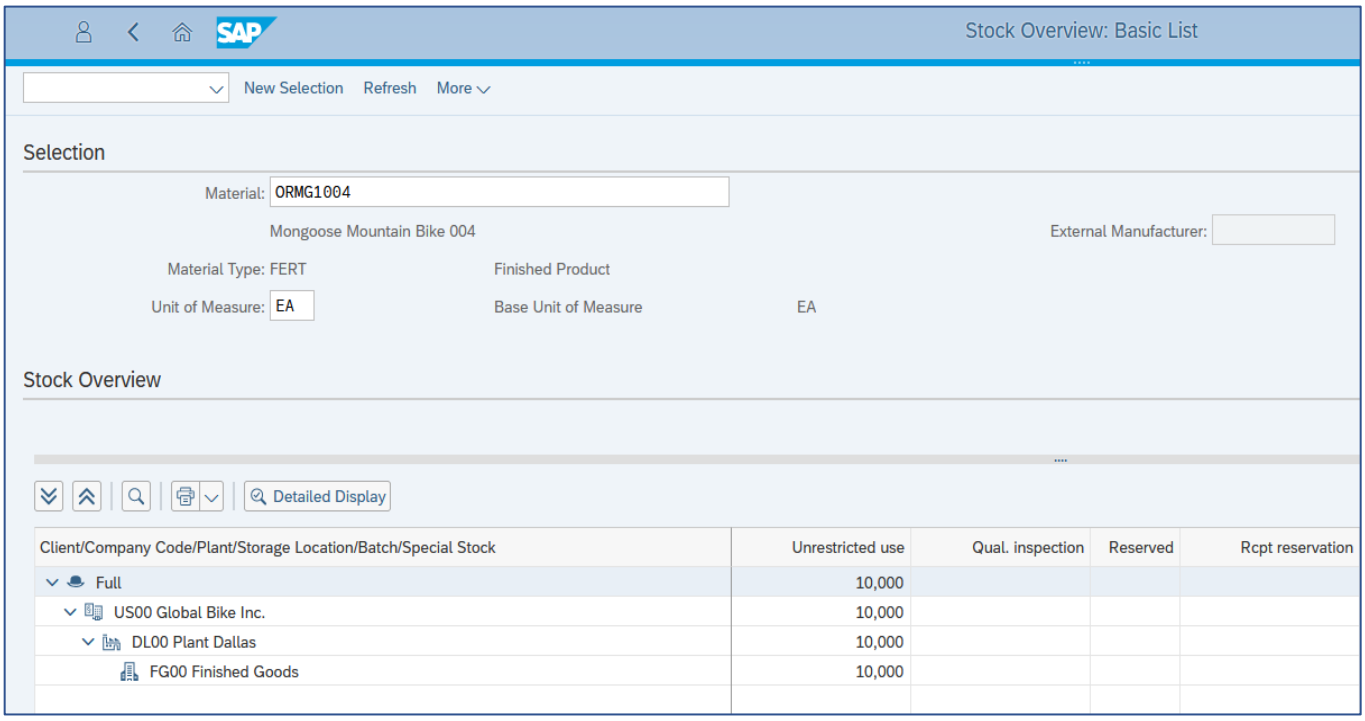
105. Check that the **Movement Type** field is 501 (Receipt w/o PO).

106. Type *DL00* (Plant Dallas) in the **Plant** field.

107. Type *FG00* (finished goods) in the storage Location: field.

108. Click < ENTER> then Post to add the stock to inventory (Ignore any warnings).
A dialog screen appears to indicate that the Material Document has been successfully created.

109. Use the **Display Stock Overview** App in the **Sales and Distribution** group to check the stock levels. What are the different types of stock and the associated stock levels?



You have completed the exercise on Material Master Data. You should be able to explain the difference between:

- Material
- Finished Product
- Sub-assembly
- Raw Material
- Bill of Materials (BOM)
- Work Center
- Routing

Once the details have been entered for these master data items then a planner, based on the demand for a bike, can determine how long it take to manufacture, when manufacturing can start, what materials are required, where the operations will take place, and the cost of manufacturing.