A Dempiere User Manual

Part C

Manufacturing

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Table of Content

1 Organisation

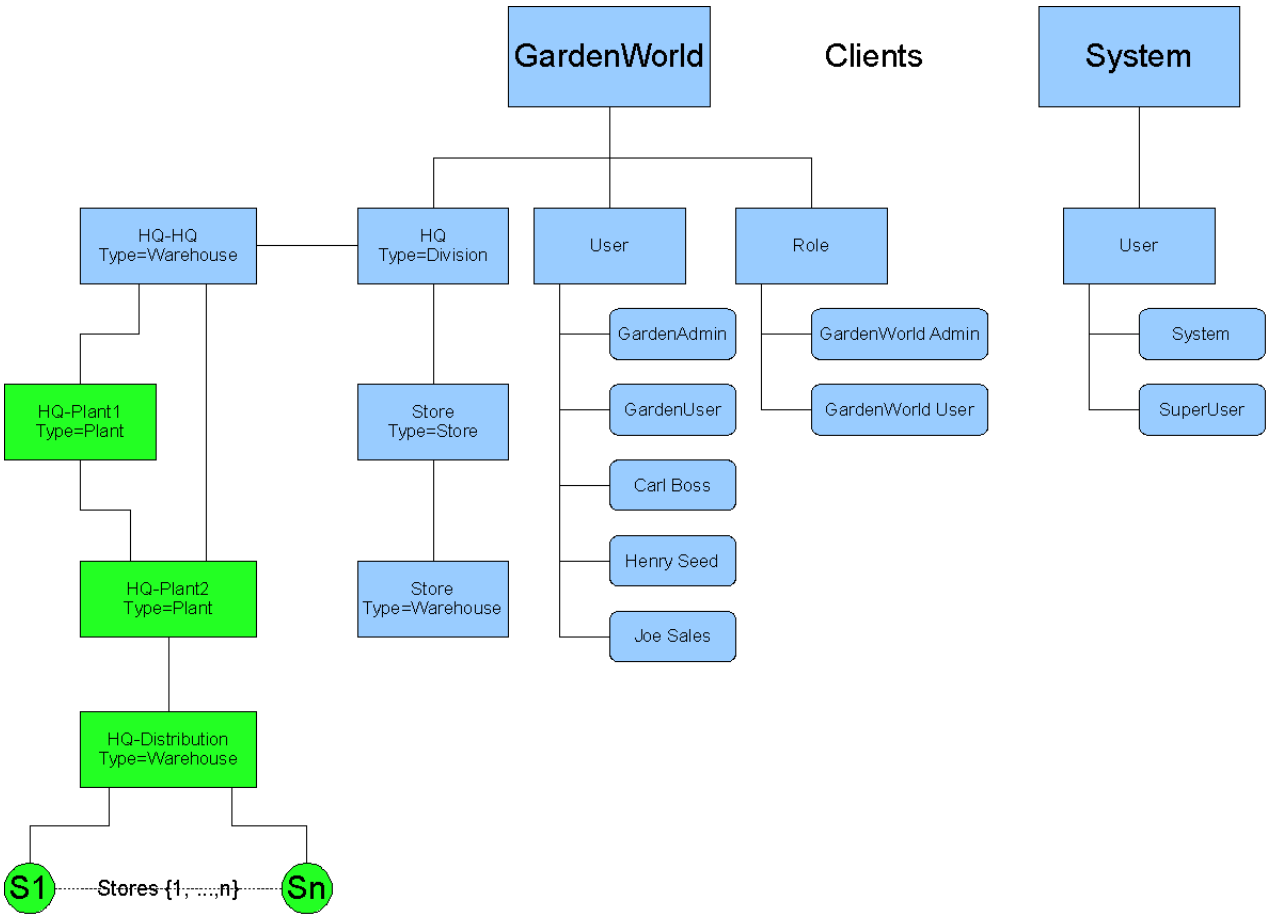
With the introduction of the Manufacturing Management (MFGM), it seems quite reasonable to enhance the Garden World (GW) sample (blue). The enhancements are marked green.

This issue raised when starting the *ADempiere Documentation Project.* There are three (initially – perhaps more to come) goals, which are targeted:

- Get a common understanding of the sample client
- Have a common document as a base for translation
  - The multis will show additional complexity
  - Common base of understanding
- Synchronize testing and documentation

1.1 Client Organization

In addition to get a common understandig about the functionality of ADempiere, the proposal to have an production oriented org-chart the following org-chart will be used to explain the Manufacturing Management functionality .



1.2 Product Configuration

Only one Product will be manufactured using the two plants HQ-Plant1 and HQ-Plant2. The plants are manufacturing is achieved using different planning algorithms.

1.2.1 Product a

Product a is required input material for Manufactured Product P1.

- Tab:Business Partner Test Vendor
- Tab:Price Pricelist Standard

1.2.2 Product b

Product b is required input material for Manufactured Product P1.

- Tab:Business Partner Test Vendor
- Tab:Price Pricelist Standard

1.2.3 Product c

Product c is required input material for Manufactured Product P2.

- Tab:Business Partner Test Vendor
- Tab:Price Pricelist Standard

1.2.4 Product d

Product d is optional input material for Manufactured Product P2.

- Tab:Business Partner Test Vendor
- Tab:Price Pricelist Standard

1.2.5 Product e

Product e is a purchased product, required for Manufactured Product f

- Tab:Business Partner Test Vendor
- Tab:Price Pricelist Standard

1.2.6 Product f

Product f is a manufactured product, to be sold from HQ-Distribution.

1.2.7 Product P1

Product P1 is a manufactured product (manufactured products must be BOM ?!)

- Input Material is taken from HQ-Warehouse – HQ Default Locator
  - component a – required / quantity 5
  - component b – required / quantity 9

1.2.8 Product P2

Product P2 is a manufactured product (manufactured products must be BOM ?!)

- Input Material is taken from HQ-Warehouse – HQ Default Locator
  - component c – required / quantity 3
  - component d – optional / quantity 1

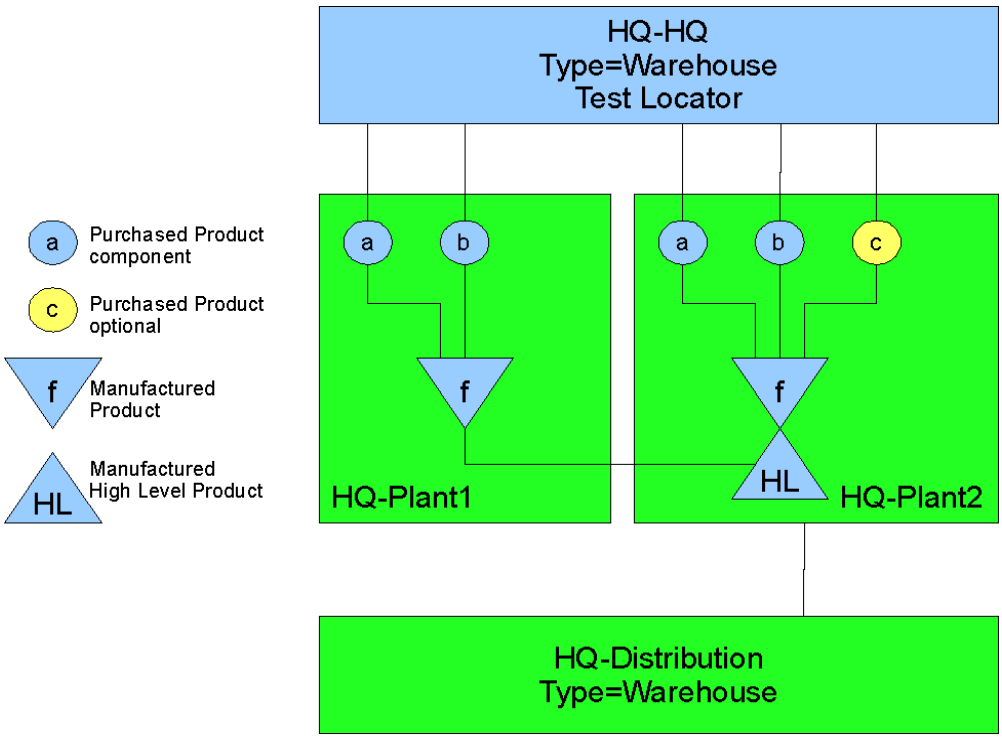
1.2.9 Product HL

Product HL (normal and deLuxe) will be manufactured in HQ-Plant1 and HQ-Plant-2.

- Input Material is taken from Manufacturing Resources
  - Product P1
  - Product P2
  - Product e
- Manufactured Product will be stored to HQ-Distribution

1.3 Manufacturing Configuration Overview

The following figure does show the products to be used and manufactured.



1.3.1 HQ-Plant1

The manufacturing of product one in HQ-Plant1 should fullfil the following requirements:

- Input Material is taken from HQ-Warehouse
  - formula (recipe, ...) is created by BOM Engineering
  - use BOM and Routing (Workflow)
- manufacturing process does have one production line
- if utilization will reach 100% send PP_Order from HQ-Plant1 to HQ-Plant2
- packaging is done in HQ-Plant2

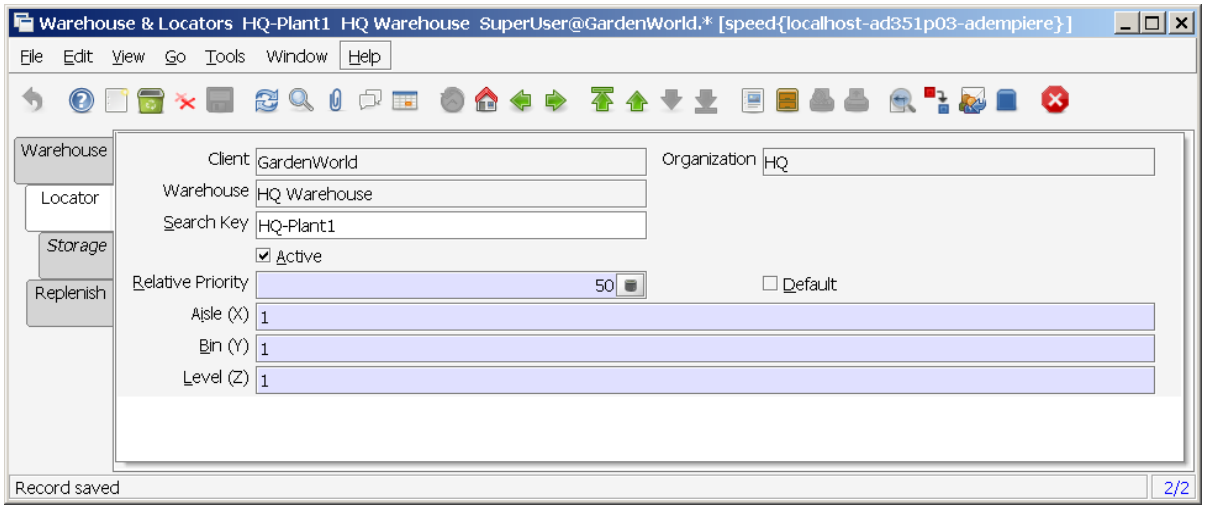
1.3.2 HQ-Plant2

The manufacturing of product one in HQ-Plant2 should fullfil the following requirements:

- Input Material is taken from HQ-Warehouse
- use Formula and Process
- batch processing
- manufacturing process does have
  - one production line
  - Packaging workstation
- use backflush method
- packaging is done for production in HQ-Plant1 and HQ-Plant2

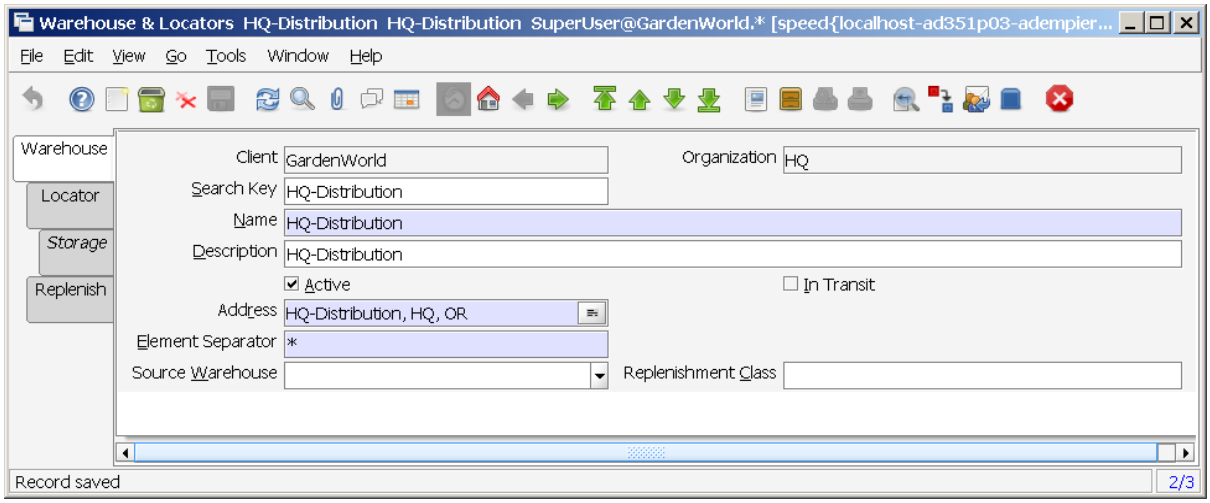
1.3.3 HQ-HQ

For GW warehouse HQ-HQ there will be defined a transit locator HQ-Plant1 to keep the required material visible.



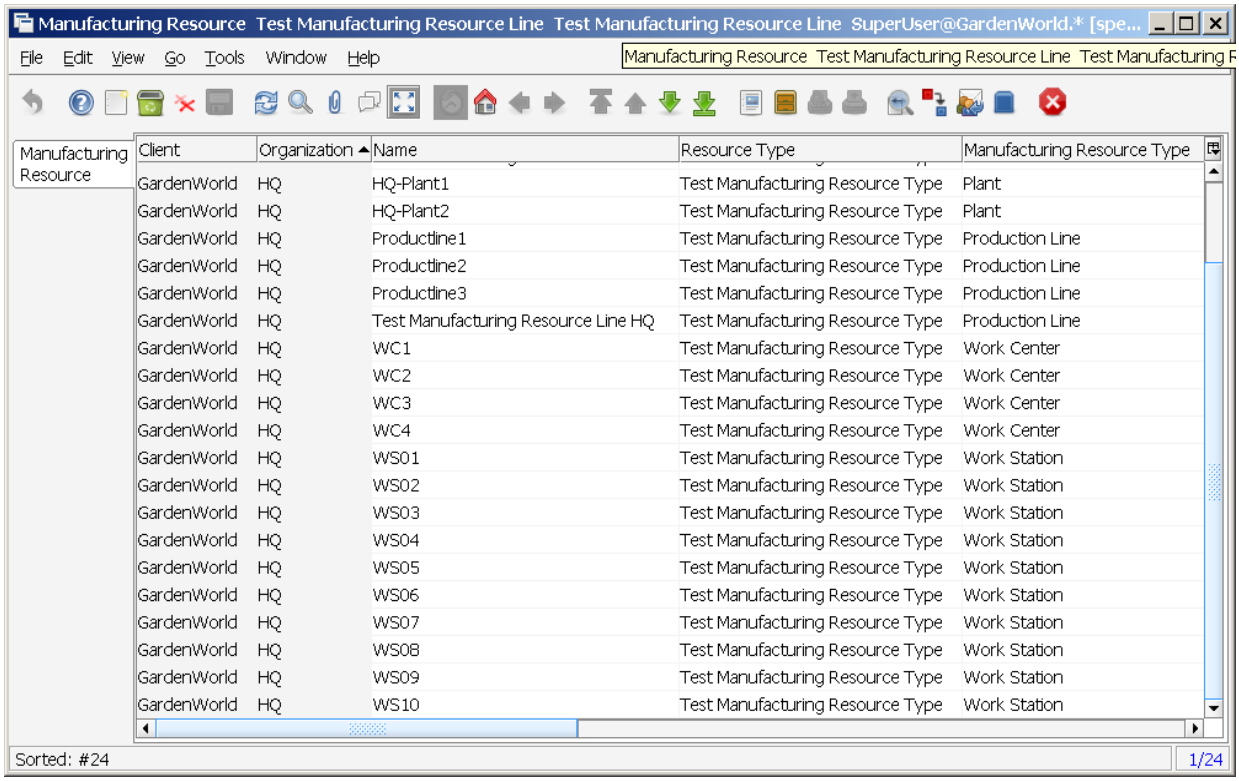
1.3.4 HQ-Distribution

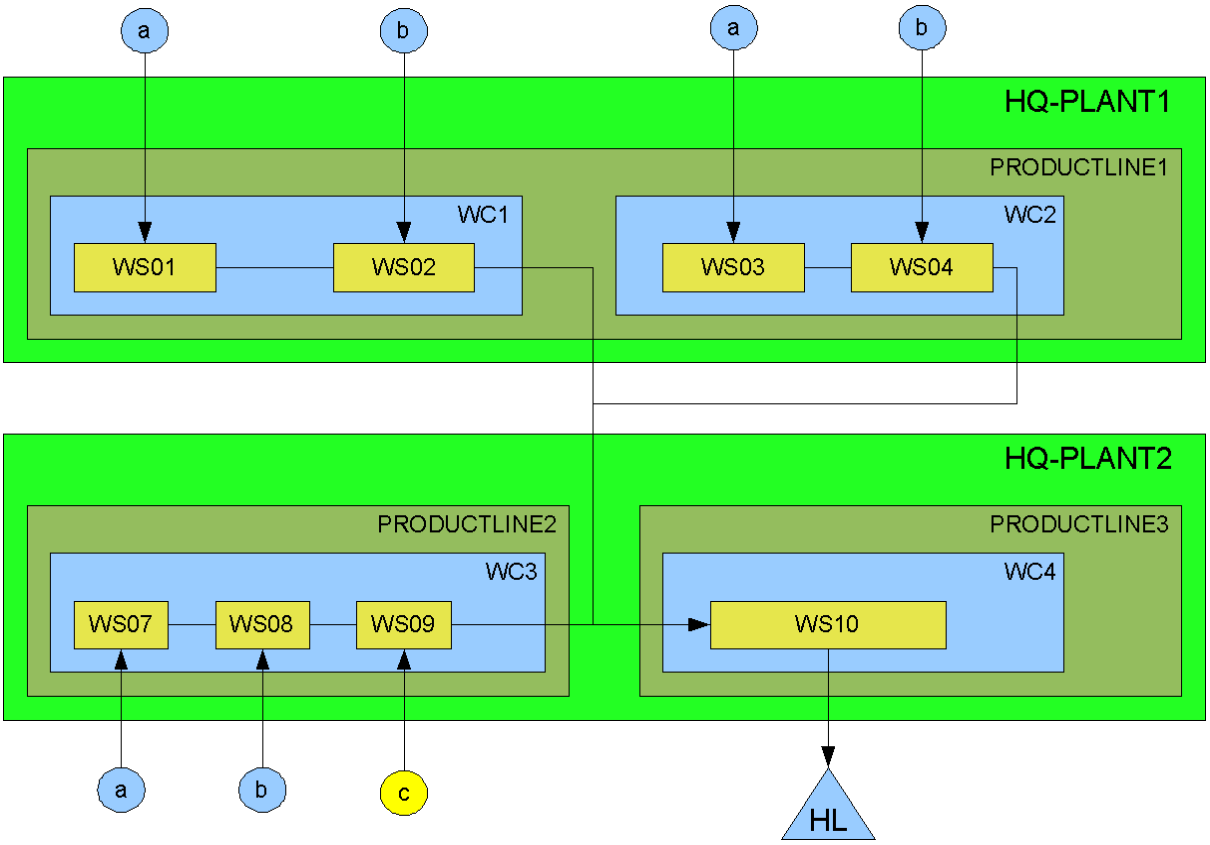
The product HL will be stored in warehouse HQ-Distribution as Input/Output, no location will be required, in order to keep it simple.



1.4 Manufacturing Configuration in Detail

The following manufacturing resources are defined





Details text --> TBD.

1.5 Libero Testplan

This is just an unverified testplan, trying to make changes between the old and new manufacturing visible. This ist based on the alpha version 3.5.1a Revision 5530.

The following testplan does only define the minimal pre-requisites, which should be fullfilled.

#	Action	Comment
1	Login	Superuser / System
1.1	Run Sequence Check	
2	Login	Superuser / GardenAdmin
2.1	Activate Calendar/Year/Period	Year 2008
2.2	Verify Document Types	Manufacture documents actually not activated
2.3	Add Product Category: Manufactured	Make manufactured products visible (ease of use)
2.4	HQ Locator Manufactured	Define a separate locator for manufactured products
3	Libero Test Plan	Based on Libero
3.1	Test Customer	
3.2	Test Vendor	
3.3	Test Purchased	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price
3.3.1	Test Product a	Window Product

		● Tab:Product ● Tab:Business Partner ● Tab:Price
3.3.2 ●	Test Product b	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price
3.3.3	Test Product c	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price
3.3.4	Test Product d	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price
3.3.5	Test Product e	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price
3.3.6	MFG Product f	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price BOM Verify
3.3.7	MFG Product P1	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price BOM Verify
3.3.8	MFG Product P2	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price BOM Verify
3.3.9	MFG Product HL	Window Product ● Tab:Product ● Tab:Business Partner ● Tab:Price BOM Verify
3.3.10	Setup Warehouse onHandQty	Setup Warehouse via Physical inventory to have onHandQty. This should avoid any errors. - 1000 Products each for HQ-Warehouse defined: ● Test Product a-e - 500 Products each for HQ-Distribution defined: ● MFG Product f, P1, P2, HL
3.4	MFG Product	
3.4.1	MFG Product f	Manufactured product must be a BOM ?!
3.4.2	MFG Product P1	BOM & Formula - CFG MFG Product P1 ● MFG Product P1 ○ Test Product a qty 5 ○ Test Product b qty 9 ● BOMtype=C BOMuse=A
3.4.3	MFG Product P2	BOM & Formula - CFG MFG Product P2 ● MFG Product P2 ○ Test Product c qty 3 ○ Test Product d qty 7 ● BOMtype=C BOMuse=A
3.4.5	MFG Product HL	BOM & Formula - CFG MFG Product HL

		• MFG Product P1
		  ○ Test Product a qty 5
		  ○ Test Product b qty 9
		• MFG Product P2
		  ○ Test Product c qty 3
		  ○ Test Product d qty 7
		• MFG Product e
		  ○ Test Product a qty 1
		• BOMtype=C BOMuse=A

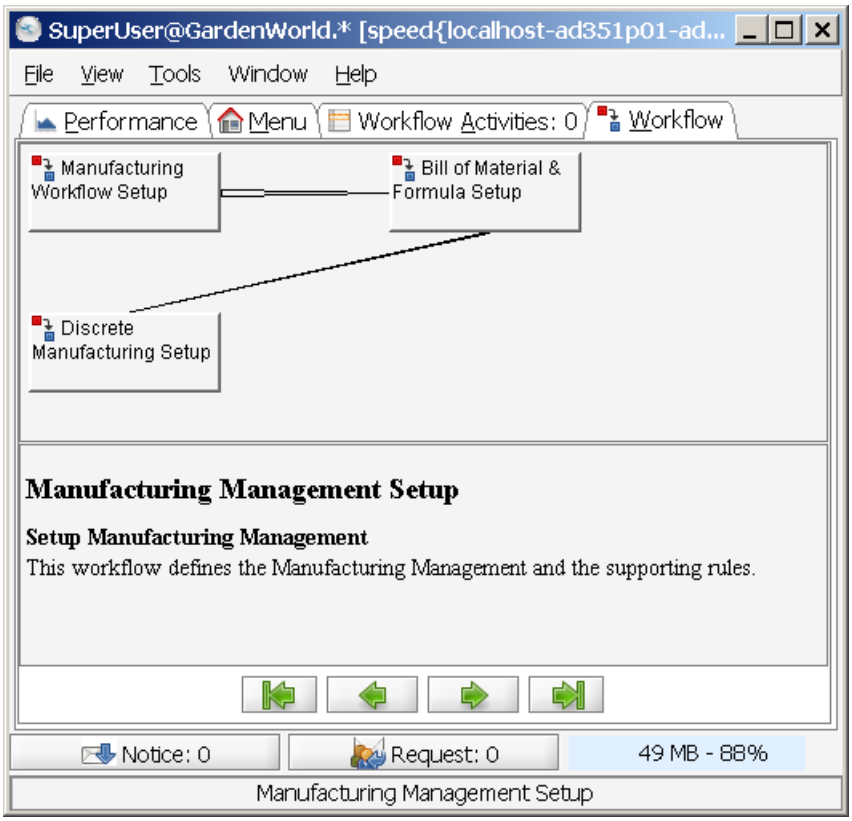
3.5	Create BOM	Create BOM with High Level manufactured BOM and purchased product
3.6	Test Manufacturing Resource Type	
3.7	Test Manufacturing Resource Plant	HQ-Plant1, HQ-Plant2
3.8	Test Manufacturing Resource Line	HQ-Line1, HQ-Line2
3.9	Test Manufacturing Resource Workcenter	Workcenter WC01-03
3.10	Test Manufacturing Resource Workstation	Workstation WS01-10
3.11	Test Manufacturing Workflow Route	Test MFG WF 01
3.11.1	Operation Nodes	Setup • Test Product e • MFG Produkt P1 • MFG Product P2 Manufacture • Test Product e • MFG Produkt P1 • MFG Product P2 Finish • Test Product e • MFG Produkt P1 • MFG Product P2
3.12	Create Product Planning Object	Depends on # 3.5 MFG Product P1 • Product a – required / component • Product b – required / component • BOM Verify MFG Product P2 • Product a – required / component • Product b – required / component MFG Product HL Name = CFG MFG Product HL (Config ?) Product = MFG Product HL BOM List • MFG Product P1 • MFG Product P2 • Test Product e Depends on 3.11
3.13	Verify the products	Products created in Step 3.3 and 3.4 • How ?
3.14	Verify BOM	Should be directly after product add • Deprecated ?
3.15	Validate Manufacturing Workflow	Press button --> Limited Verification ! Functional test --> Howto ?
3.16	Create a Sales Order	BOM Drop Function

The Testplan for the manufacturing workflow has to be created.

TBD

2 Change Notice

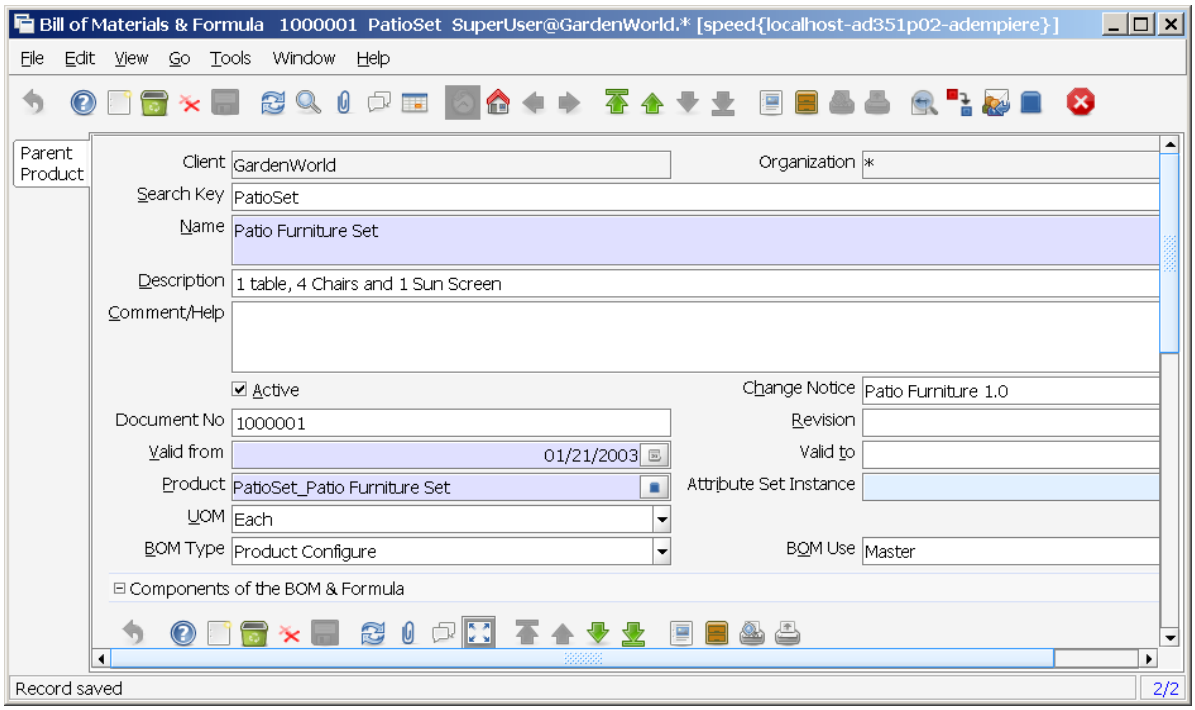
Menu: Manufacturing Management < Engineering Management < Change Notice



2.1 Change Notice

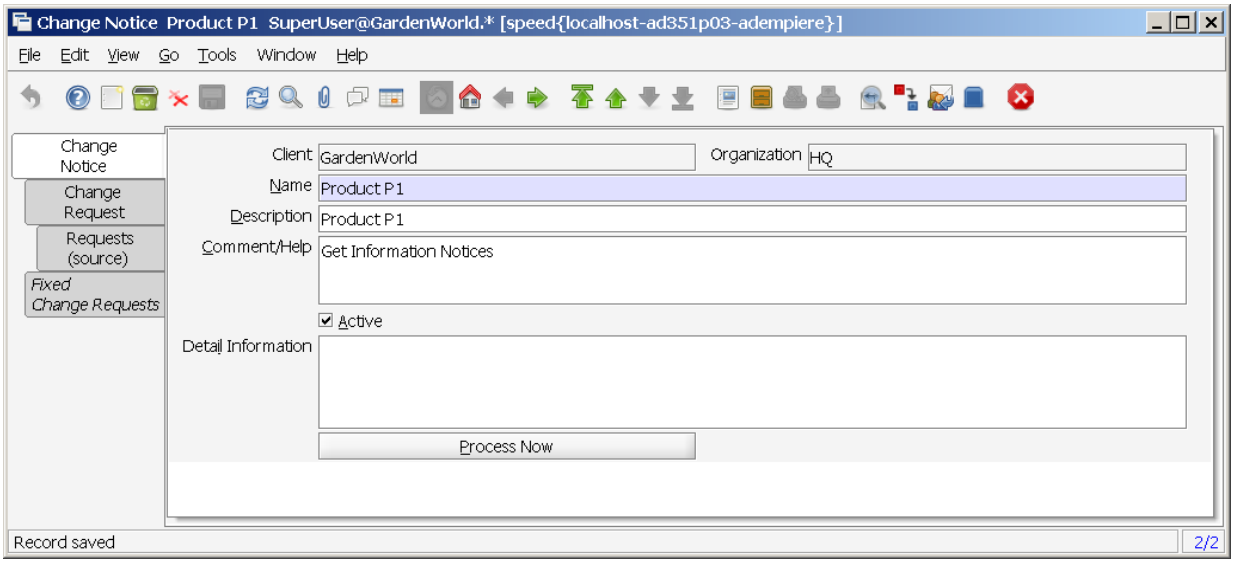
Menu: Manufacturing Management < Engineering Management < Change Notice

The Change Notice is issued in the Chnage Notice field of Window: Bill of Materials & Formula Tab: Parent Product



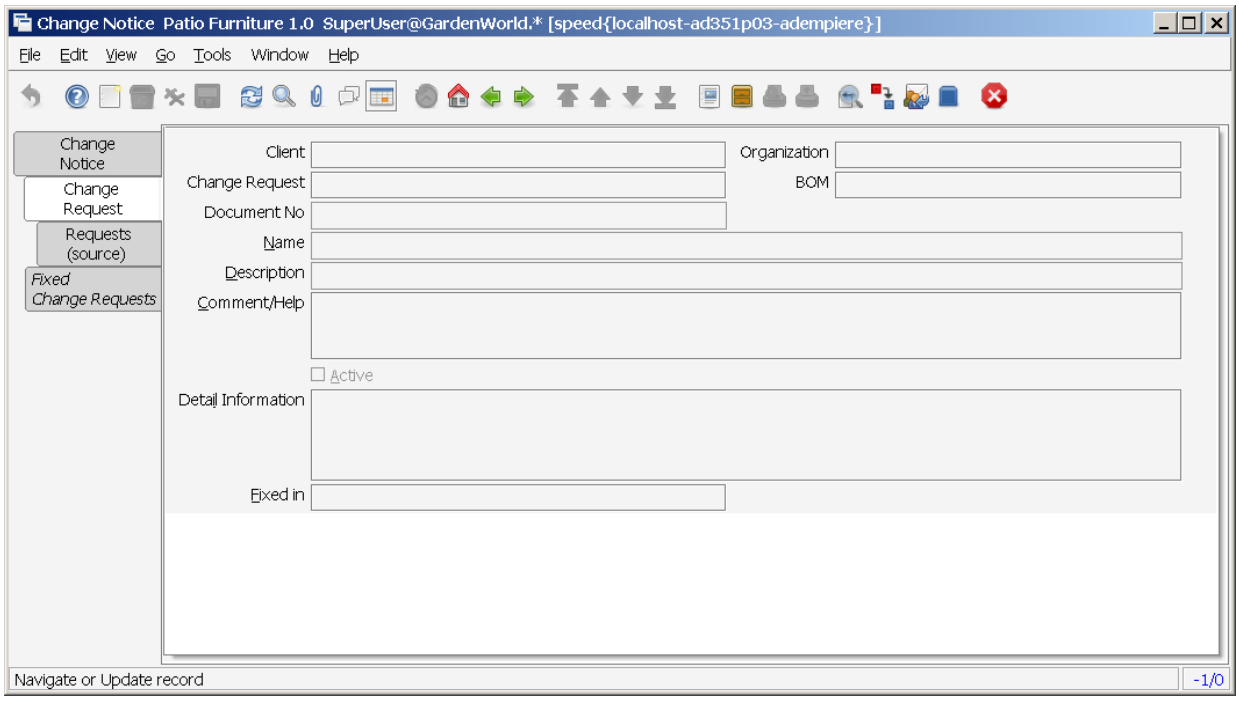
2.1.1 Tab: Change Notice

Menu: Manufacturing Management < Engineering Management < Change Notice



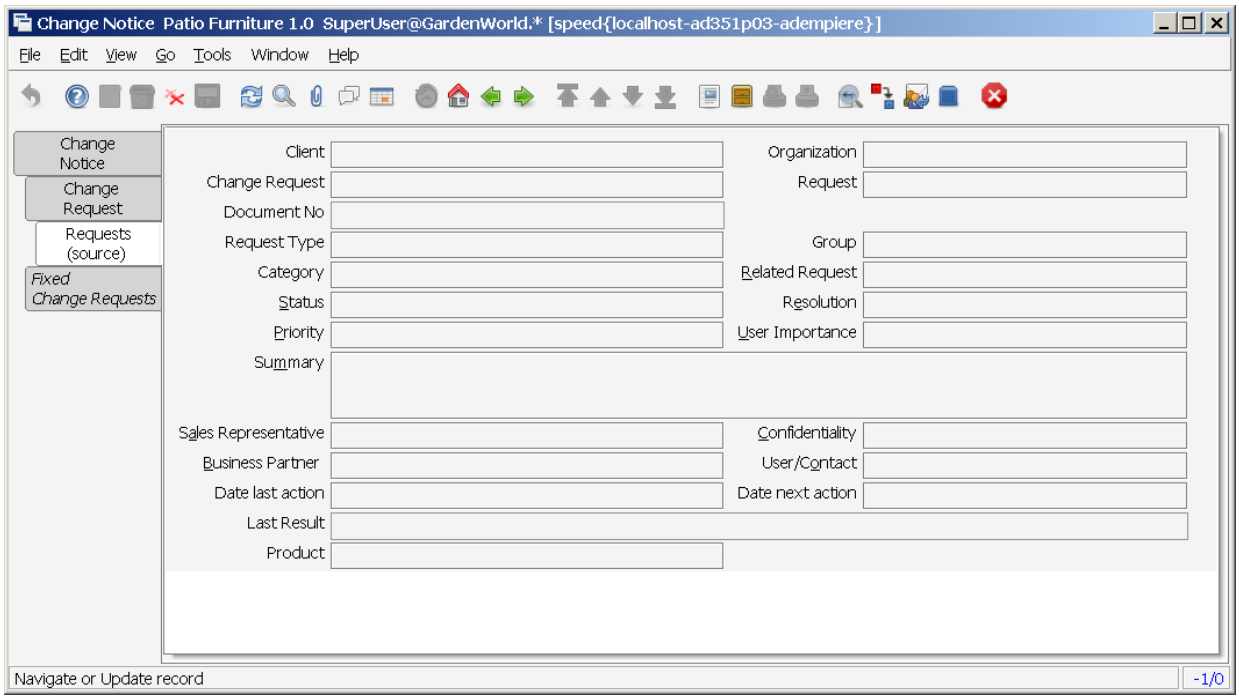
2.1.2 Tab: Change Request

Menu: Manufacturing Management < Engineering Management < Change Notice



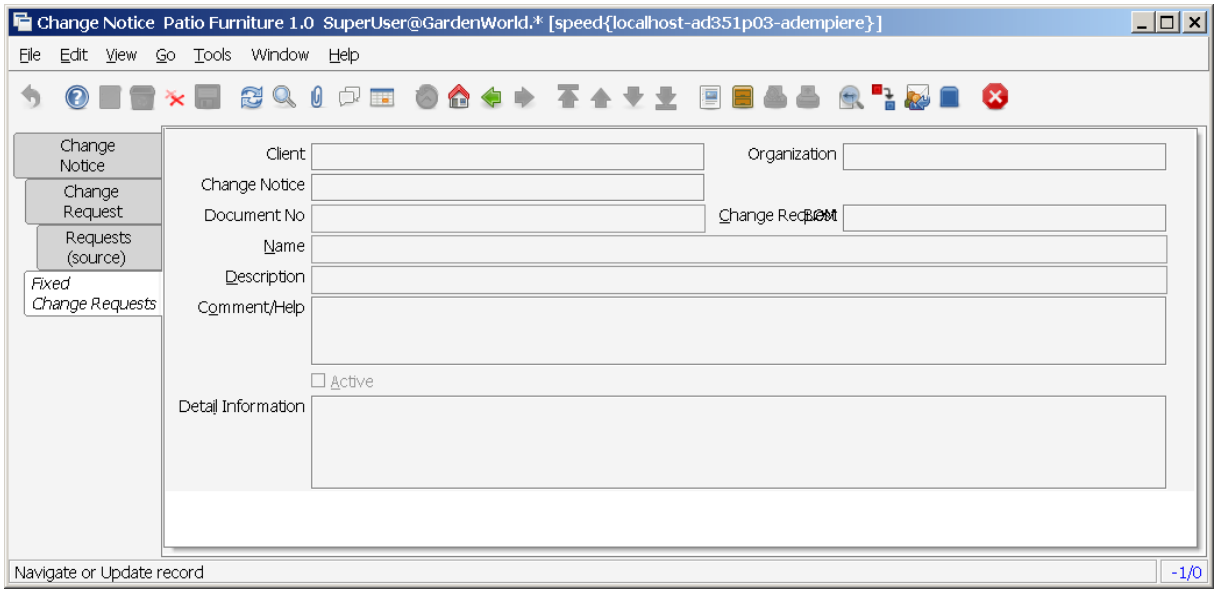
2.1.3 Tab: Requests (source)

Menu: Manufacturing Management < Engineering Management < Change Notice



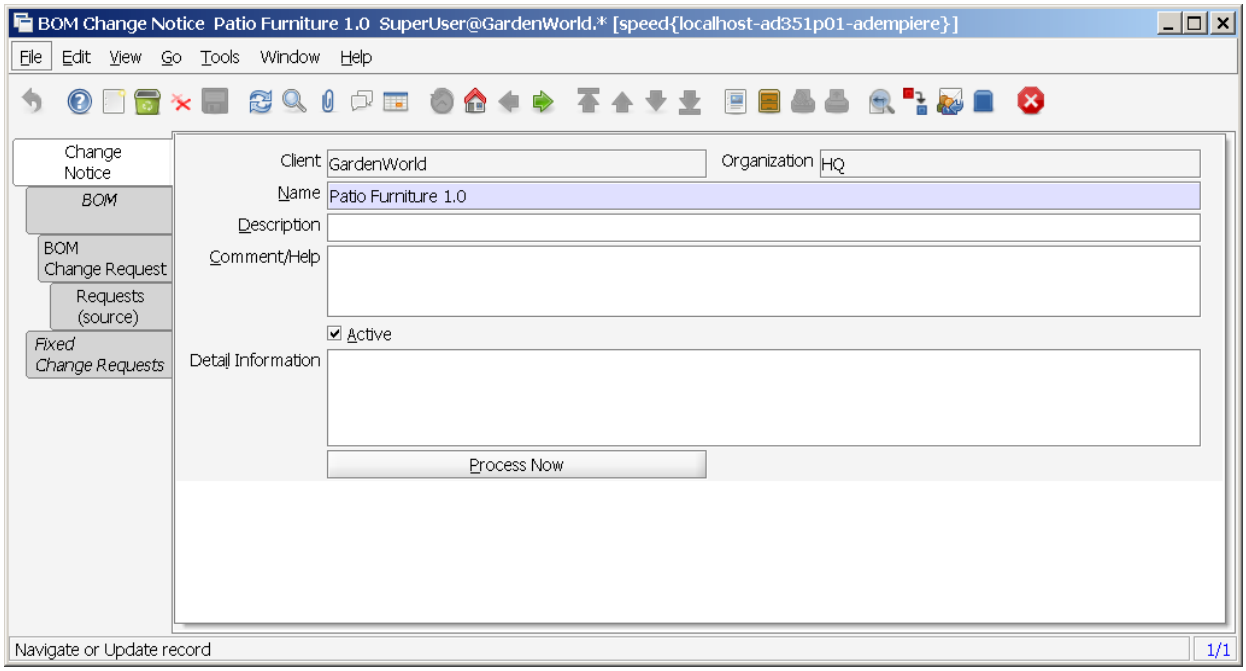
2.1.4 Tab: Fixed Change Requests

Menu: Manufacturing Management < Engineering Management < Change Notice



2.2 BOM Change Notice

Menu: Manufacturing Management < Engineering Management < BOM Change Notice



3 Engineering Management

3.1 Resource Manufacturing

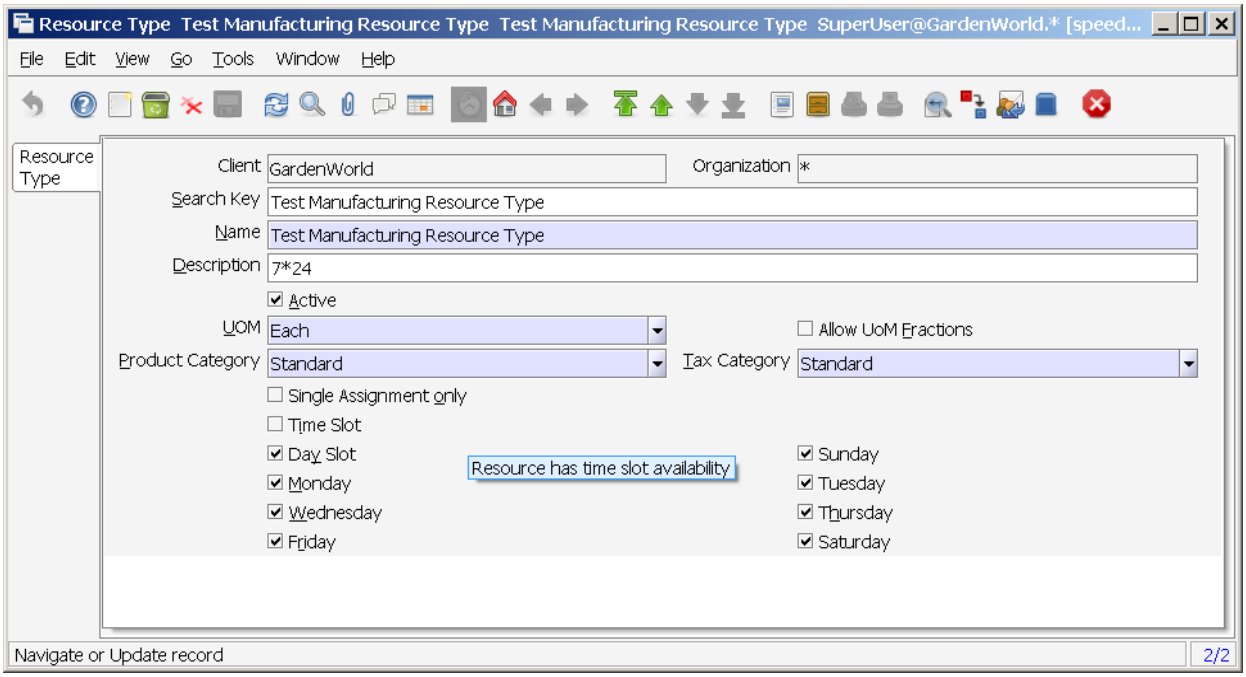
A **Manufacturing Resource** is defined as anything required for production and its unavailability can affect the Production Plan. Manufacturing Resources can be: *Plants, Production lines, Work Centers* and *Work Stations*.

It mainly answers the question: Where is the product made?

3.1.1 Resource Type

Menu: Manufacturing Management < Engineering Management < Resource Manufacturing < Resource Type

The **Resource Type Window** is the ADempiere standard option which it is used to calculate the available time in a resource. It allows input of *starting time* and *end time* for the slot according to the working days. For additional information, please have a look at Menu:Partner Relations < Service < Resource



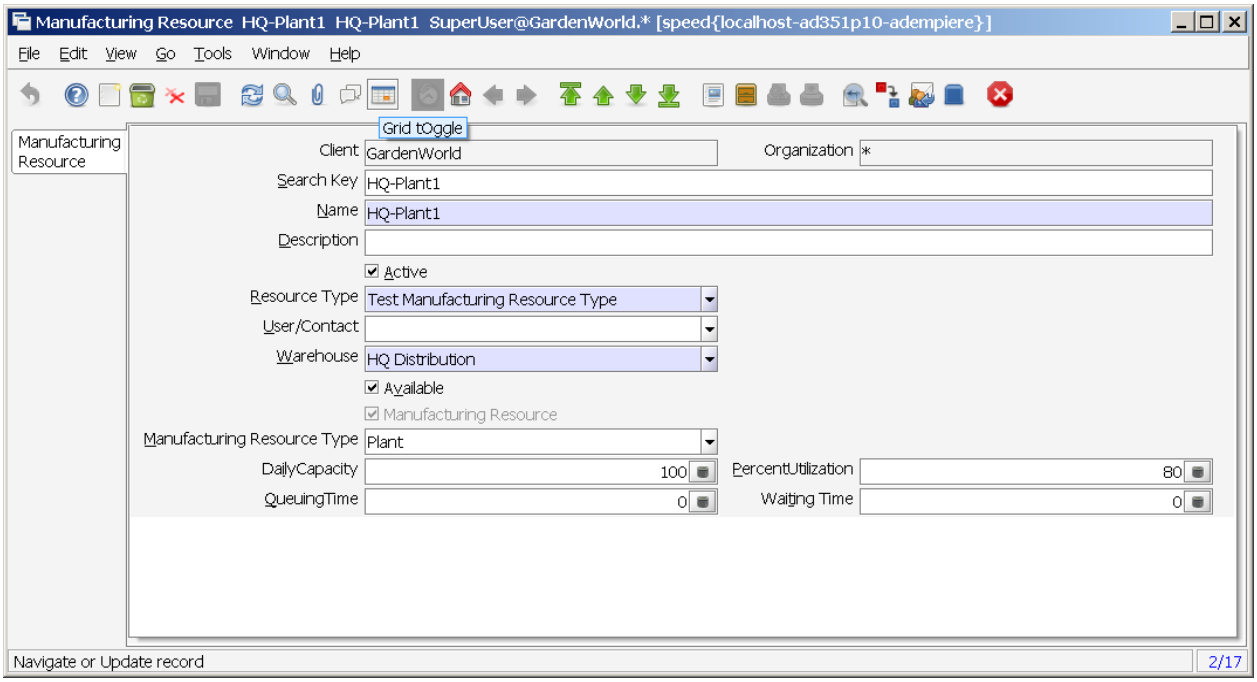
The *Resource Type* field allows you to identify the capacity for this resource.

3.1.2 Manufacturing Resource

Menu: Manufacturing Management < Engineering Management < Resource Manufacturing < Manufacturing Resource

When you tick the *Is Manufacturing Resource* check box the next fields are shown: *Manufacturing Resource Type, Daily Capacity, Percent Utilization, Queuing Time* and *Waiting Time*.

In the *Manufacturing Resource Type* field you can select a **Resource** among *Work station,*



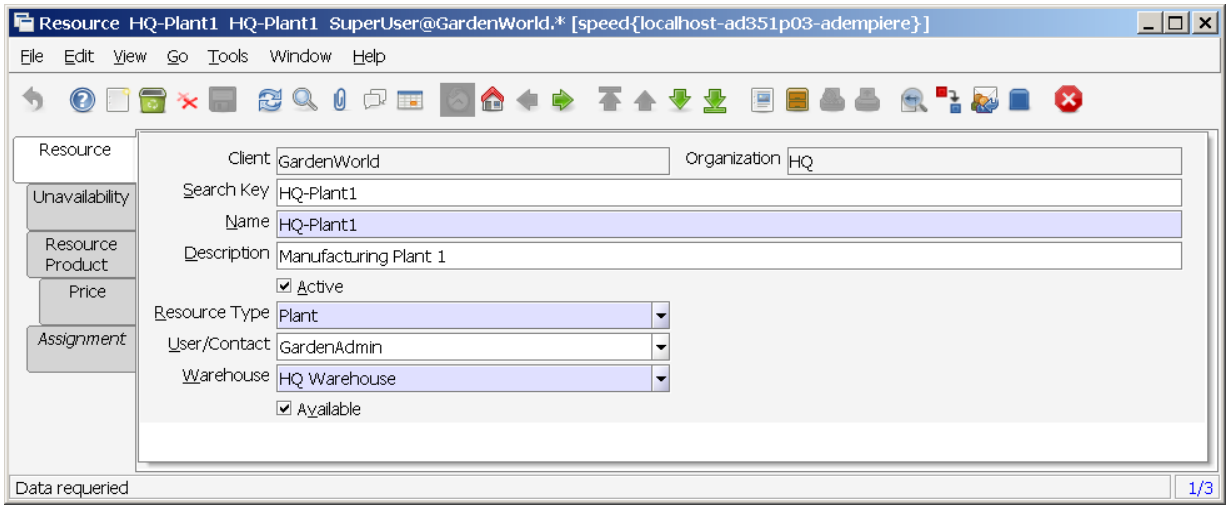
Production Line, Work Center or *Plant*. Normally a group of work stations will be integrated into a work center, a group of work centers in a Production line and a group of production lines in a **Plant**. This relation is build in a hierarchy which is used to accumulate the required and available capacity since the lower to the upper hierarchies for each resource.

The *Utilization Percent* for a resource is defined as the required time for that resource divided by the available time, the result is multiplied by 100.

The *Queue Time* is the time which normally a manufacturing order operation has to wait since it is moved to this operation until it starts to be worked. The *Waiting Time* is the time which normally a manufacturing order operation has to wait since it is finished until it is moved to the next operation or to the warehouse. Both, queue time and waiting time entered in the resource are used as default values for the nodes in the workflow.

You can enter *holidays*, the *planned cost* etc. as you need, when you enter the following

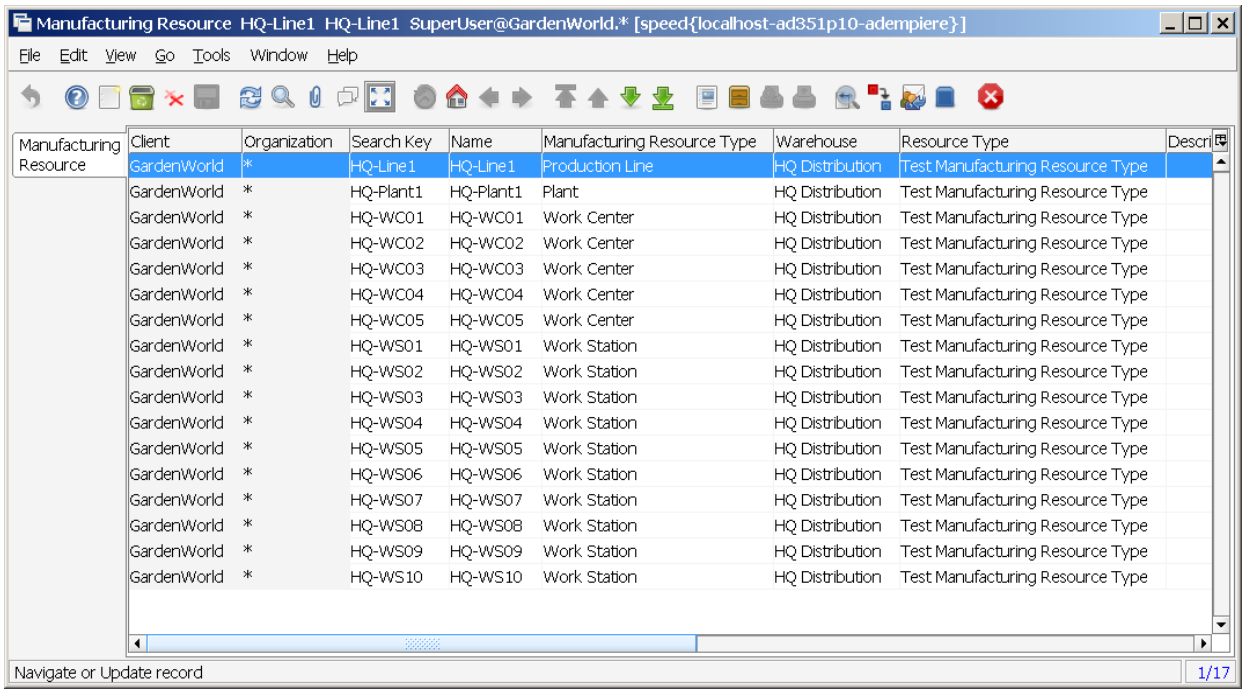
Menu: Partner Relations < Service < Resource



The available daily time will be calculated for every weekly working day selected, when you tick the *Day Slot*. The calculation to get the available time for a day substracts the time when the slot starts, from the time when the slot ends.

3.1.3 Overview of the Manufacturing Resources

Overview of all defined Manufacturing resources



3.2 Manufacturing Workflows

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflow

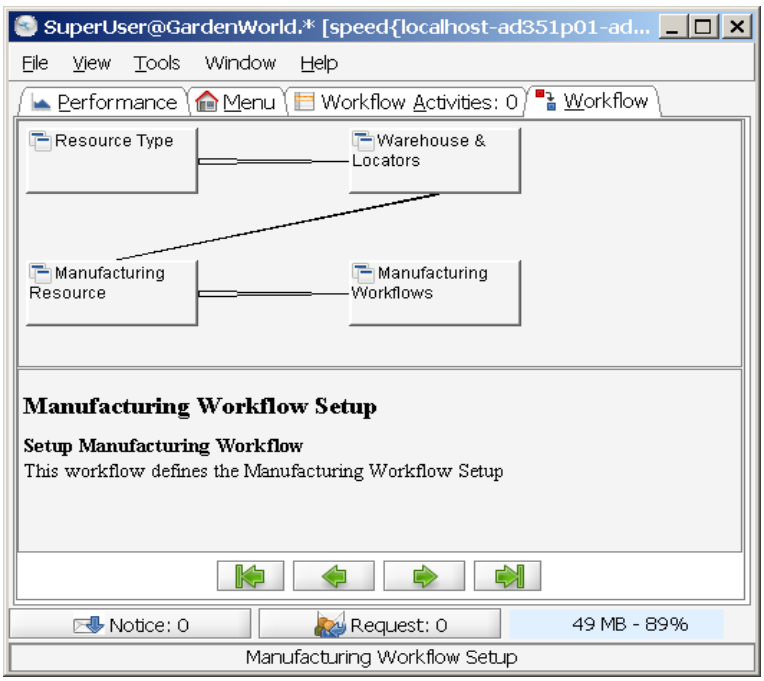
The Manufacturing Workflow (**Routing**) is a tool which allows to define the required activities to fabricate a product taking into account the process sequence, how long does it take the node (**operation**) and where it should be done.

To use **ADempiere Workflows** gives you a great flexibility for describing the production process.

It answers the question: How should the product be made?

3.2.1 Manufacturing Workflow setup

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflow < Manufacturing Workflow Setup



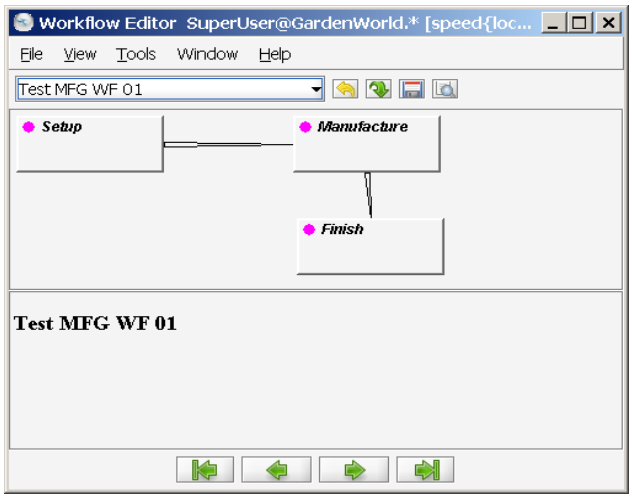
The Manufacturing Workflows Setup Window gives an overview about prerequisit tasks to be checked.

- Resource Type (Chapter 3.1.1)
- Warehouse & Locators (Chapter ...)
- Manufacturing Resource (Chapter 3.1.2)
- Manufacturing Workflows (Chapter 3.2.2)

3.2.2 Window: Manufacturing Workflows

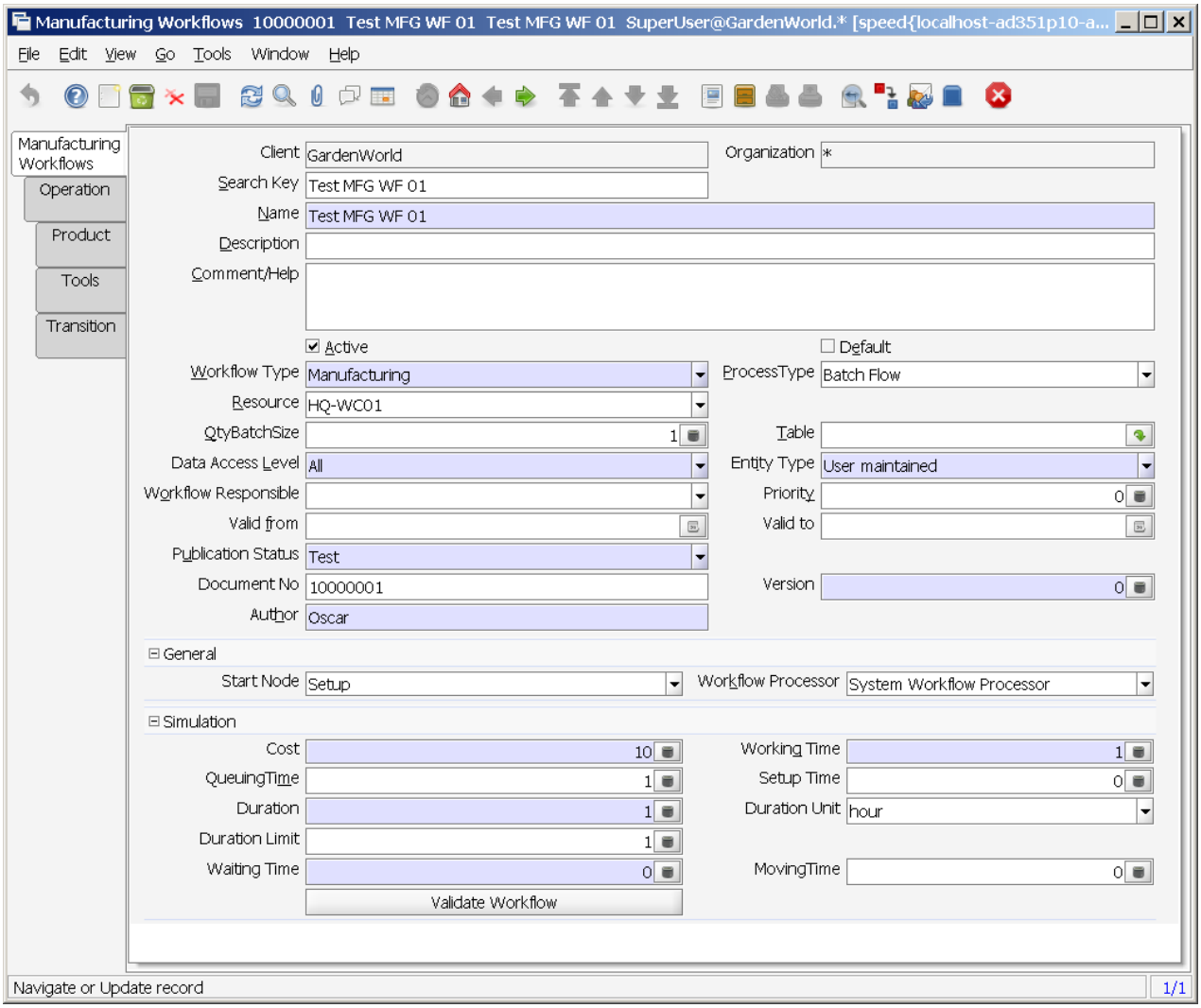
Via the *Window: Manufacturing Workflows* it is possible to define a workflow in order to fabricate a product in any Organization of the Client (Garden World / *) or in a specific Organization with a Client (Garden World / HQ).

Found in AD:Window-Tab: WorkflowType='M' OR WorkflowType='Q'



3.2.2.1 *Manufacturing Workflows*

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflow < Manufacturing Workflows



You must use the *Tab: Manual Workflows* to enter the general information,

- Type the Name to identify this specific workflow. If the workflow name is the same as the product name this WF will be the default WF for the product.
- Enter a Description if you wish.
- The Process Type is selected among several options depending on the characteristics of the process you want to manage. The Process Type is only a reference and has the next valid options according with the APICS classification:
  - Continuous Flow: Continuous flow usually refers to the production or processing of fluids, wastes, powders, basic metals, and other bulk items. An oil refinery crude oil into various petroleum products or a pipeline for water, oil, or natural gas are examples of continuous flow manufacturing and distribution processes.
  - Dedicated Repetitive Flow: Discrete parts such as shafts and connecting rods and discrete assemblies such as microcomputers may be produced by a repetitive flow

process. The term dedicated implies that the production facility produces only one product, including product variances (such as color) that require no setup delay in the manufacturing process.

  - Batch Flow: Is functionally the same as the continuous or the repetitive, except two or more products are manufactured in the same facility. Because of long setup times in the batch flow shop, manufacturing runs for each product typically last several hours or several days.
  - Repetitive Flow Mixed Model: It is also used to manufacture two or more models. However, the changeover time between models is minimal, and the different models are intermixed on the same line.
  - Job Shop: is characterized by the organization of similar equipment by function (such as milled, drilled, turned, forging, and assembly). As jobs flow from manufacturing resource to manufacturing resource a different type of operation is performed in each manufacturing resource.
  - Plant: ??????????????

- Fixed Site (Project): It has the main characteristic that the materials, tools and personnel are brought to the manufacturing resource where the product is going to be fabricated.
- The Resource field is a reference of the manufacturing resource where the work will be made (Plant).
- In Batch Size you give the product quantity witch can be done by each batch. If we are going to produce more than 1 batch the system will schedule several batches in the manufacturing resource (production line), the quantity of each one will be taken from the pack size quantity to get the MO quantity required.
- Data Access Level field shows the access level to this record.
- In the Work Flow Responsible field you enter the person, role or organization in charge of the Work Flow.
- Priority indicates how important is this entity, the valid entries are Hight, Medium or Low.
- In the field Valid From-To is registered the time period into which the Workflow is valid.
- The Document Number is allocated by the system and it comes from the sequence defined in the Document Sequence menu option.
- Author is the person that created the record.
- The Starting Node shows the first activity (node) of the work flow.
- Finally, in the Manufacturing Work Flow Tab you can see the fields group Time, the fields included in this group are:
- Accumulated Time: currently is a reference where you enter the total time required to to accomplish every node of this WF.
- Queue Time: Currently is a reference where you enter the accumulated queue time for this WF. The Queue time is the time usually taken since the previous operation is finished, or the components were issued from the warehouse, until the current operation in a manufacturing order starts its process.
- The Setup Time Currently is a reference where you enter the accumulated Setup time for this WF. The Setup time is the time required to execute the necessary activities in a

manufacturing resource to be able to start the manufacturing process.

- Duration WF: Currently it is a reference where you enter the accumulated Duration for this WF. The Duration WF is the normal duration of a job, in duration units.
- Duration Unit is the time unit of measure for this group of fields (e.g. hours, minutes etc). Every time recorded in this work flow will be referenced at this Duration Unit.
- Waiting Time: Currently is a reference where you enter the accumulated Waiting time for this WF. The Waiting Time is the time a job remains at a manufacturing resource until it is moved to the next operation or to the warehouse it the operation is the last one.
- Move Time: Currently is a reference where you enter the accumulated Move time for this WF. It is the estimated time to move the material thought the manufacturing resources.

Clicking on the button Validate Work Flow it verifies that the work flow does not have errors.

After the process validation has finished it shows the message correct (OK) if the workflow is correct (with a limited verification).

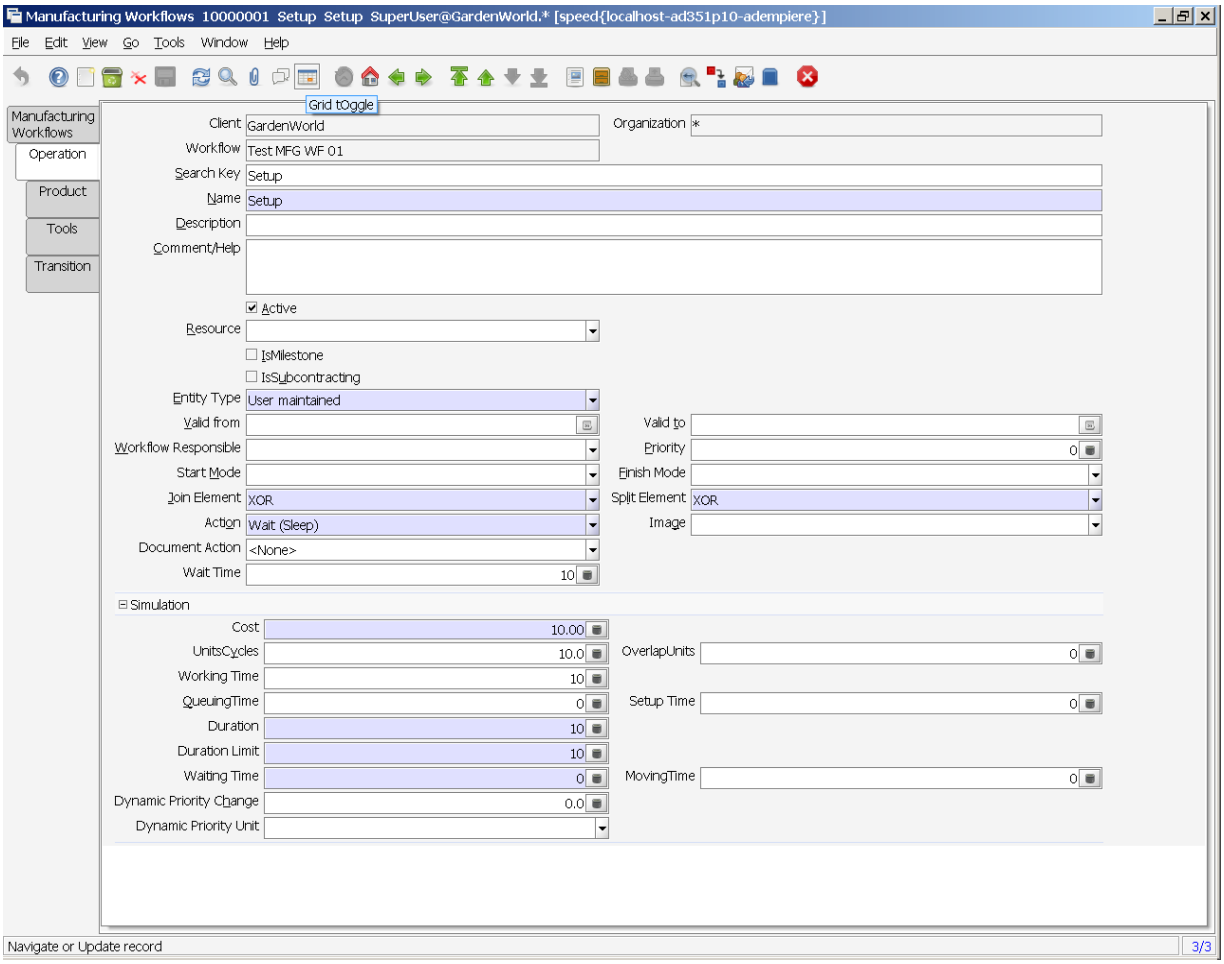
3.2.2.2 Tab: Operation

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Operation

In the Operation (Node) Tab is introduced the

- Required: The field Name is used to identify the operations from the manufacturing routing.
- Optional: Use the Description for describing the operation.
- Optional: Use the Comment/Help for further advice to help the user.
- *Active*
- From the selection list Resource select the manufacturing resource (previously defined) where you want to execute the operation. For the product costing, the Resource rate is taken from the cost element introduced in the window Product Costing.
- *IsMilestone*
- *IsSubcontracting*
  - *If the check box Is Subcontract is selected, it indicates that this operation will be executed by an external Resource.*
- *IsControlOperation*
  - if selected it will indicate that in this operation you will report the real time used in the operation and that for all the previous operations, until the last control operation, the standard time will be used as real time. (this feature will be used in the Shop Floor Control Module).

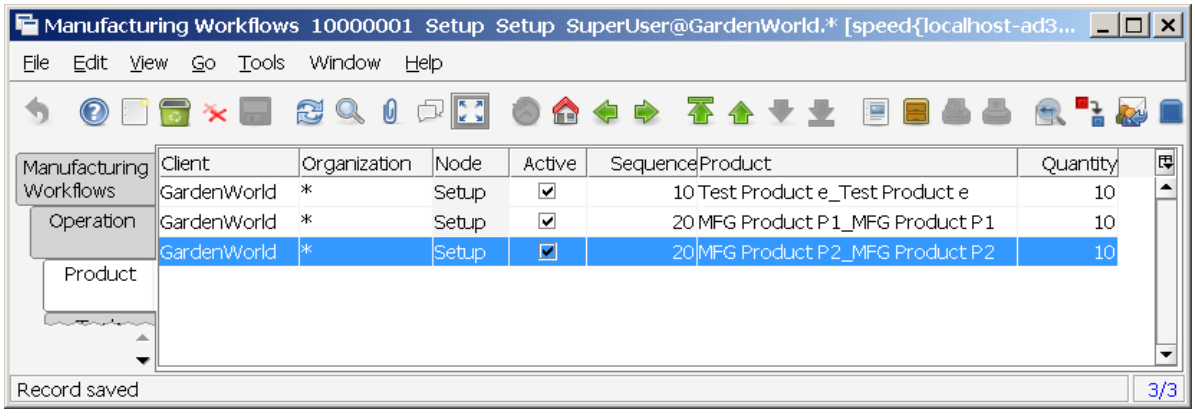
The following workflow operation is the definition for the first operation -- > Setup



3.2.2.3 *Tab: Product*

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Product

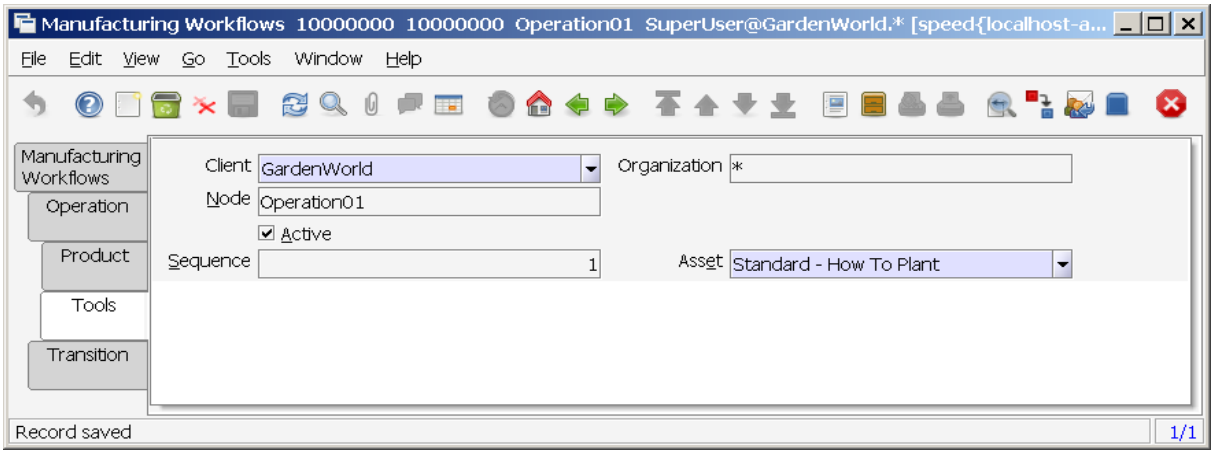
The following screenshot is the grid display for the products, involved in the Setup Operation of the first workflow operation.



3.2.2.4 Tab: Tools

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Tools

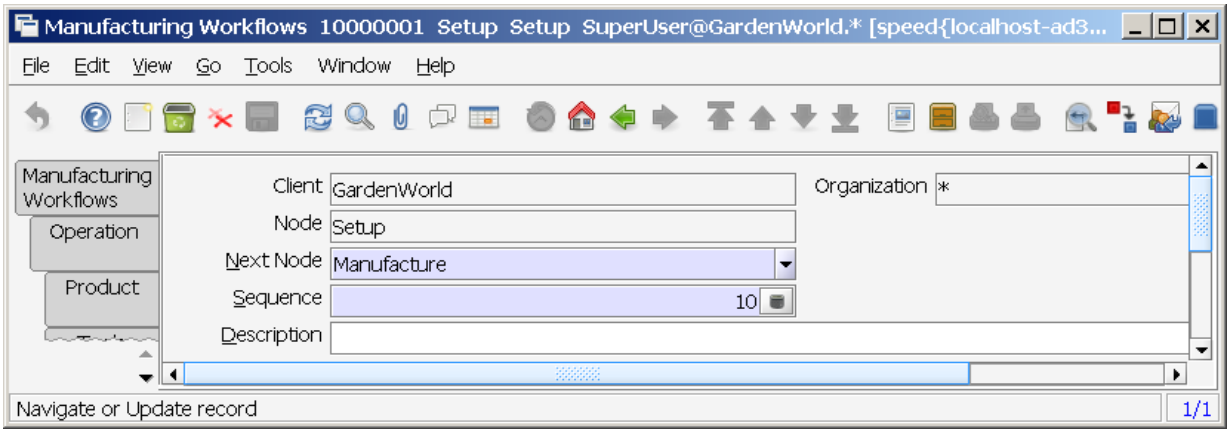
Only a screenshot, which is not used in this configuration. It is just to show the parameters.



3.2.2.5 Tab: Transition

Menu: Manufacturing Management < Engineering Management < Manufacturing Workflows < Transition

Via the Tab:Transition the next operation is defined as next node, which is Operation:Manufacture.



3.2.3 Workflow Editor

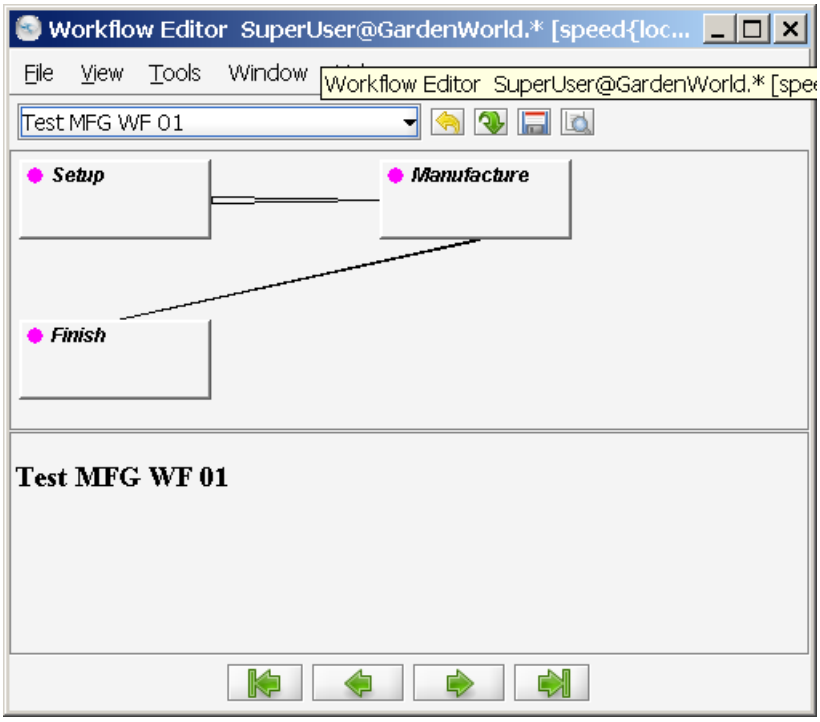
This Menu item does provide an interface to search for specifc workflow to be edited. The required information to establish the sequence of the nodes is in the Node Tab and in the field Start Node field introduced in the Workflow Tab.

To be able to do a Manufacturing Schedule both forward or backward, the system uses the characteristics set in the Node tab and the sequence from the Sequence tab.

By Work Flow Editor it is possible to visualize in graphic mode the operations of the production

process and its execution sequence. At the same time you can see the information registered in the fields: Name, Description and Help from the Work Flow window.

When you select the zoom icon you get the Workflow window.



3.3 Bill of Material & Formulas

It is a list of all the subassemblies, intermediates, parts and raw material that go into a parent assembly showing the quantity of each required to make an assembly. There are a variety of display formats of bill of material, including single level bill of material, indented bill of material, modular (planning), costed bill of material, etc. May also be called “formula,”, “recipe”, “ingredients list” in certain industries.

It answers the question, what are the components of the product?

3.3.1 BOM Types

The following BOM-Type values are defined:

- *BOMTYPE_AD_Reference_ID*=347;
- *BOMTYPE_CurrentActive* = "A";
- *BOMTYPE_Make_To_Order* = "O";
- *BOMTYPE_Previous* = "P";
- *BOMTYPE_PreviousSpare* = "S";
- *BOMTYPE_Future* = "F";
- *BOMTYPE_Maintenance* = "M";
- *BOMTYPE_Repair* = "R";
- *BOMTYPE_ProductConfigure* = "C";

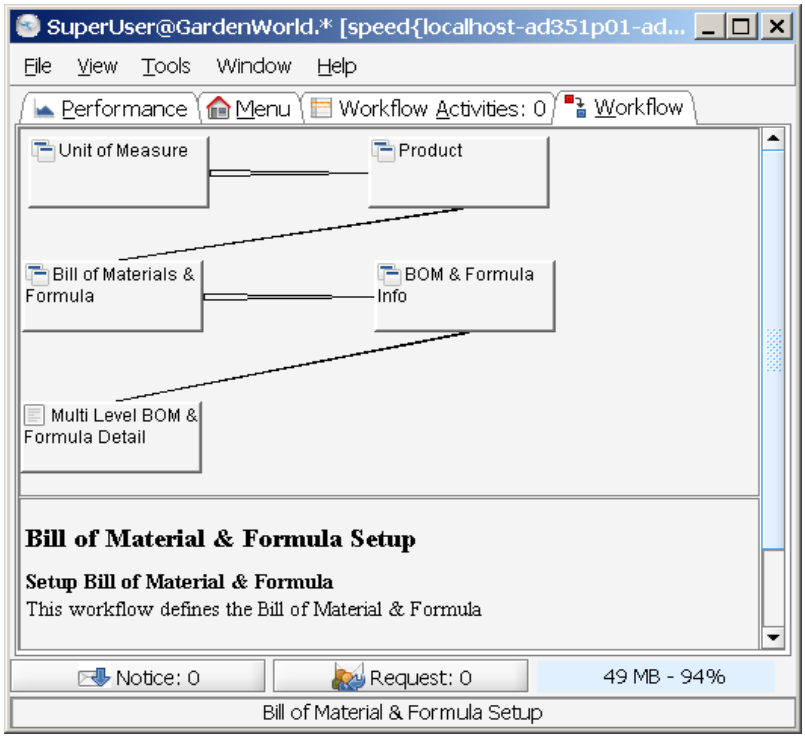
3.3.2 BOM USE

The following BOM-USE values are defined:

- *BOMUSE_AD_Reference_ID*=348;
- *BOMUSE_Master* = "A";
- *BOMUSE_Engineering* = "E";
- *BOMUSE_Manufacturing* = "M";
- *BOMUSE_Planning* = "P";
- *BOMUSE_Quality* = "Q";

3.3.3 Bill of Material & Formula Setup

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Bill of Material & Formula Setup



3.3.4 Bill of Materials & Formula

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Bill of Materials & Formula

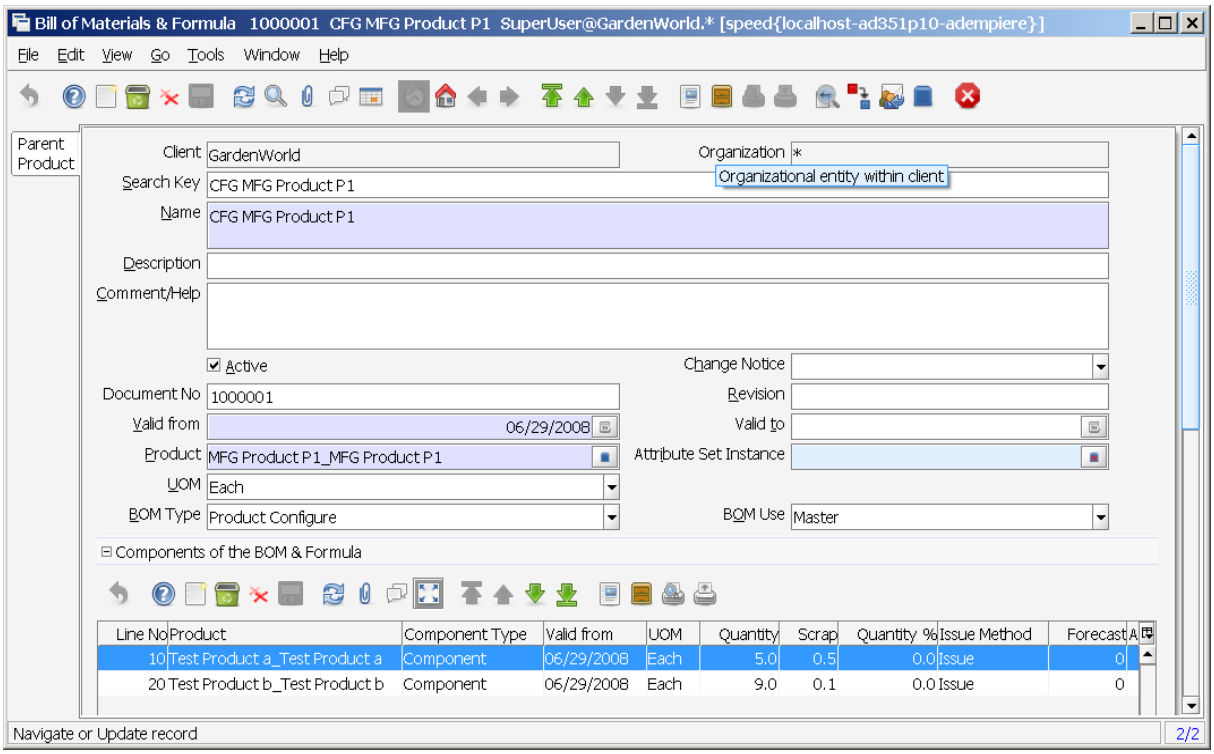
In the Bills of Material Tab the following fields are required to identify in a specific way the bills of Material: Client, Organization, Search Key and Name.

Additionally with the Engineering Change Document number you can track the modifications made to the BOM. The sequence of the ECD is allocated by the system using the Sequence entered for this Document Type.

Initially, create a BOM Product within Material Management < Material Management Rules < Product. This is achieved, selecting the BOM checkbox. This Product seems to be required, as it

looks like with PatioSet. But I'm not sure right now. Don't forget to run BOM Verify, after the data in the required tabs within Window:Product have been entered. This process will set the checkbox verified.

This will be seen with the following example, too.



In the Bill of Material tab the following fields are required: Client, Organization, Search key and Name to identify in a unique way the bill of material and the Engineering Change Document Number used to track the modification.

The Revision field shows the number of revision you have made for this BOM and the Valid from and Valid to indicates the valid period for this BOM (In that period you can use de BOM in a manufacturing order).

The product field along with the product instance identify the parent product. The manufacturing Unit of Measure is also introduced and it will be taken into account for the quantities entered for the components.

The BOM Type is the same one used in the Product Window, in the BOM tab for the parent product. The valid options are Optional Products, Alternative Groups and Standard Part. To get more information around BOM please refer to the Chapter 5 of the Compiere User Manual.

Then you introduce the detailed information around the BOM for every component using the BOM tab.

The required information in the Bill of Materials is the Product child and the Attribute Set Instance.

The Valid From and Valid To dates indicate the valid time period to use the BOM in a Manufacturing Order.

The Component Type Selection List has the next options:

- Component: identify a raw material, ingredient, part, or subassembly that goes into a

higher level assembly, compound or other item. Byproduct: This entity is a non scheduled product gotten as a consequence of another production process. It has a sales value but it is minimum.

- Phantom: indicates the product is a fictitious assembly, that is to say, a set of components that are grouped only to make easier the analysis in a separated way from the rest of the BOM. When the MRP generates a requirement of the phantom and the projected on hand is not available, the process goes to the lower level and start a new MRP cycle but does not create Planned Orders for the phantom product.
- Packing: This product will not be taken into account to calculate the total quantity of components when the IsQtyPercentage check box is ticked.
- Planning: The parent product will be used for the planning process of the different options of similar products. (e.g. 30 % bread with fiber and 70 % bread without fiber)
- Tools:The product is a tool which is going to be used in a production operation.

If you click the IsQtyPercentage it means you need to introduce the quantity of the componenet as a percentage of all the components. If you do not click the IsQtyPercentage checkbox then you need to introduce in the Qty field the quantity of the component to produce a unit of measure of the parent product.

If you click IsCritical checkbox, a Manufacturing Order will not be released to the shop floor if this component is not on hand.

In the Assay field you enter a percentage of components that will be used to make a test.

The Scrap field is introduced as a component percentage factor that is expected not to be useful as a part of the parent production.

The Issue Method field permit you to select between Issue or Backflush, if you choose issue you need two steps, first you issue the components from the warehouse and after production you need a second warehouse movement of receiving the finished product into the warehouse.

If you choose backflush in one single movement you receive the finished product in the warehouse and automatically you issue the components required from the warehouse.

The Backflush Group is used in order to group components that you want to issue together in a Backflush process.

Lead Time offset is the number of days after you start to produce the finished product when you need this component.

Forecast is the percentage we expect to use of this component to produce the finished product. It is used to make plans of getting components and it has a BOM type of Planning BOM and you can not use this BOM for a manufacturing order. Forecast is displayed if BOMUSE=P(lanning).

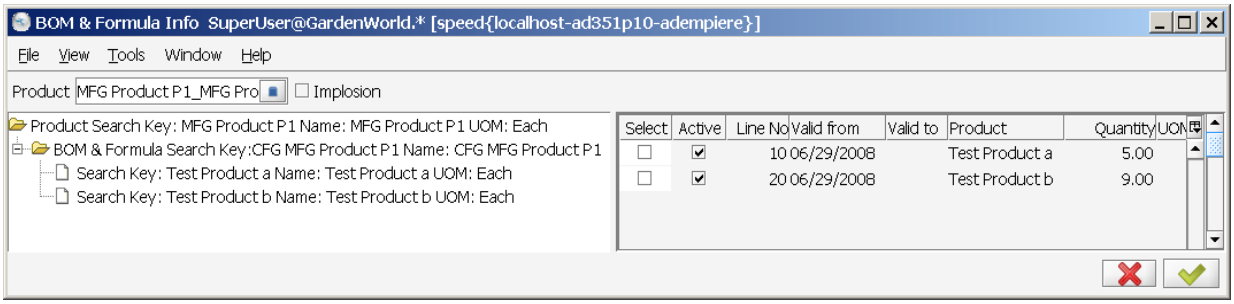
3.3.5 BOM & Formula Info

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < BOM & Formula Info

The BOM & Formula Review option menu shows in two different panels the parent-component relationship for the product entered in the Product field.

You need to introduce the parent product you want to see its components then click the OK button, next drag the left margin of the panel to the right and you will have the two panels.

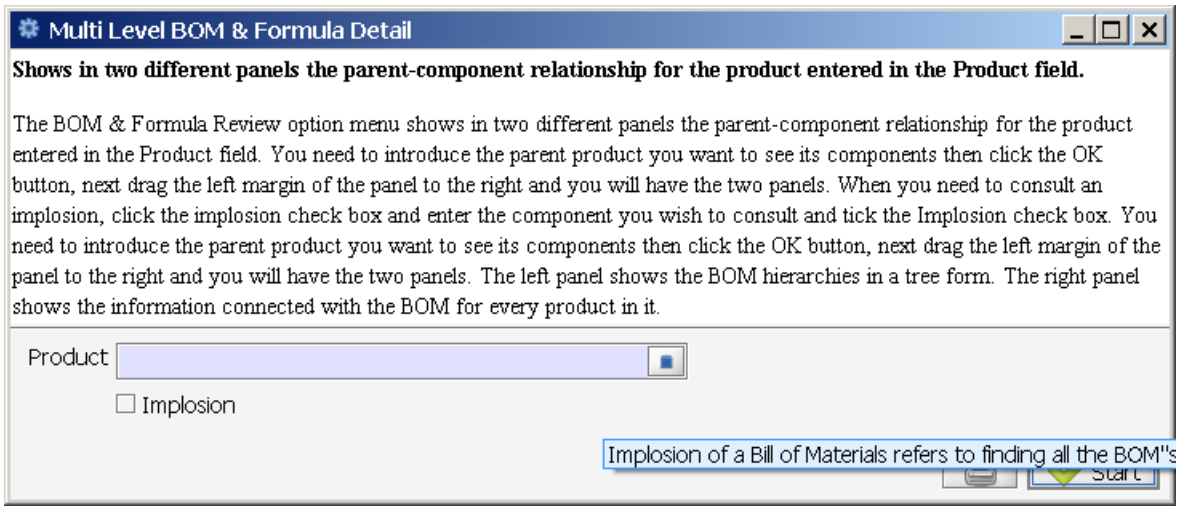
When you need to consult an implosion, click the implosion check box and enter the component you wish to consult and tick the Implosion check box.

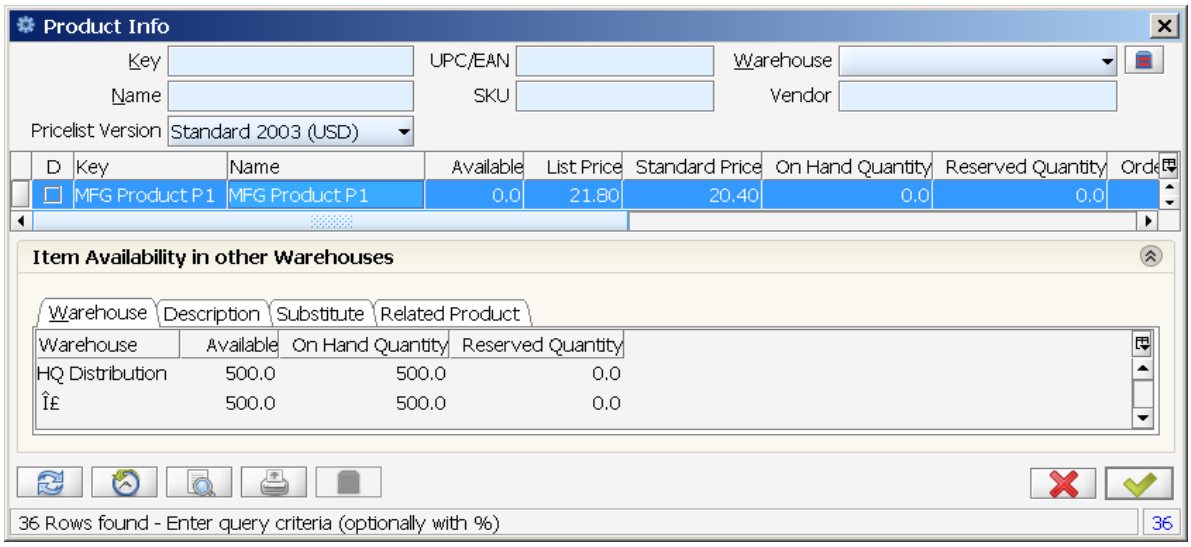


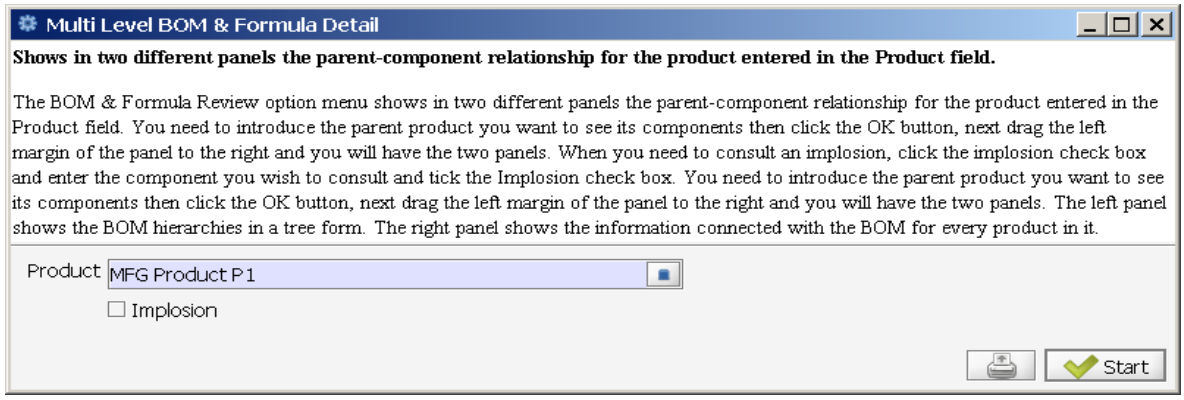
The left panel shows the BOM hierarchies in a tree form. The right panel shows the information connected with the BOM for every product in it. To get more information around the meaning of the fields please refer to the upper section of this Chapter.

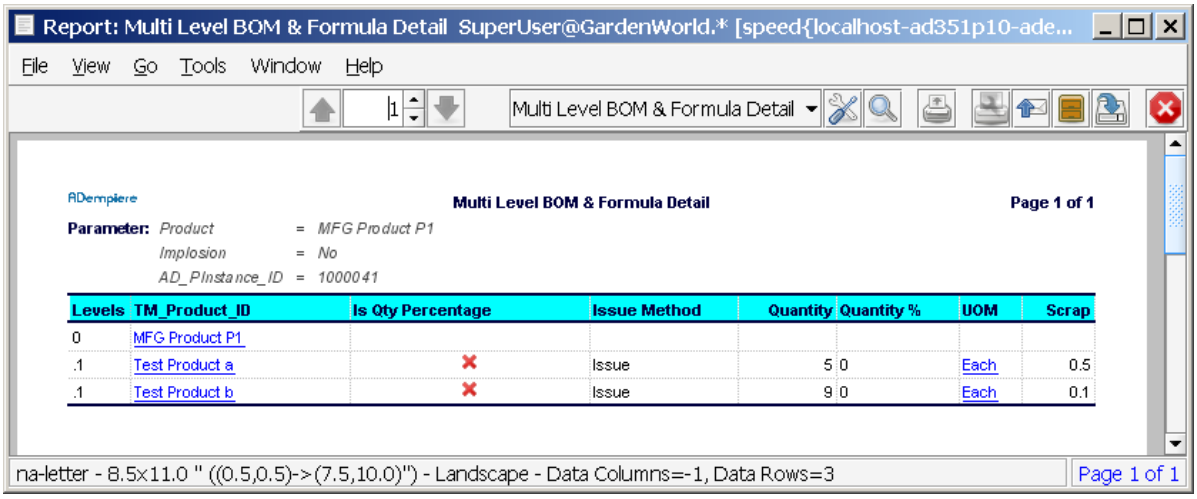
3.3.6 Multi Level BOM & Formula Detail

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Multi Level BOM & Formula Detail



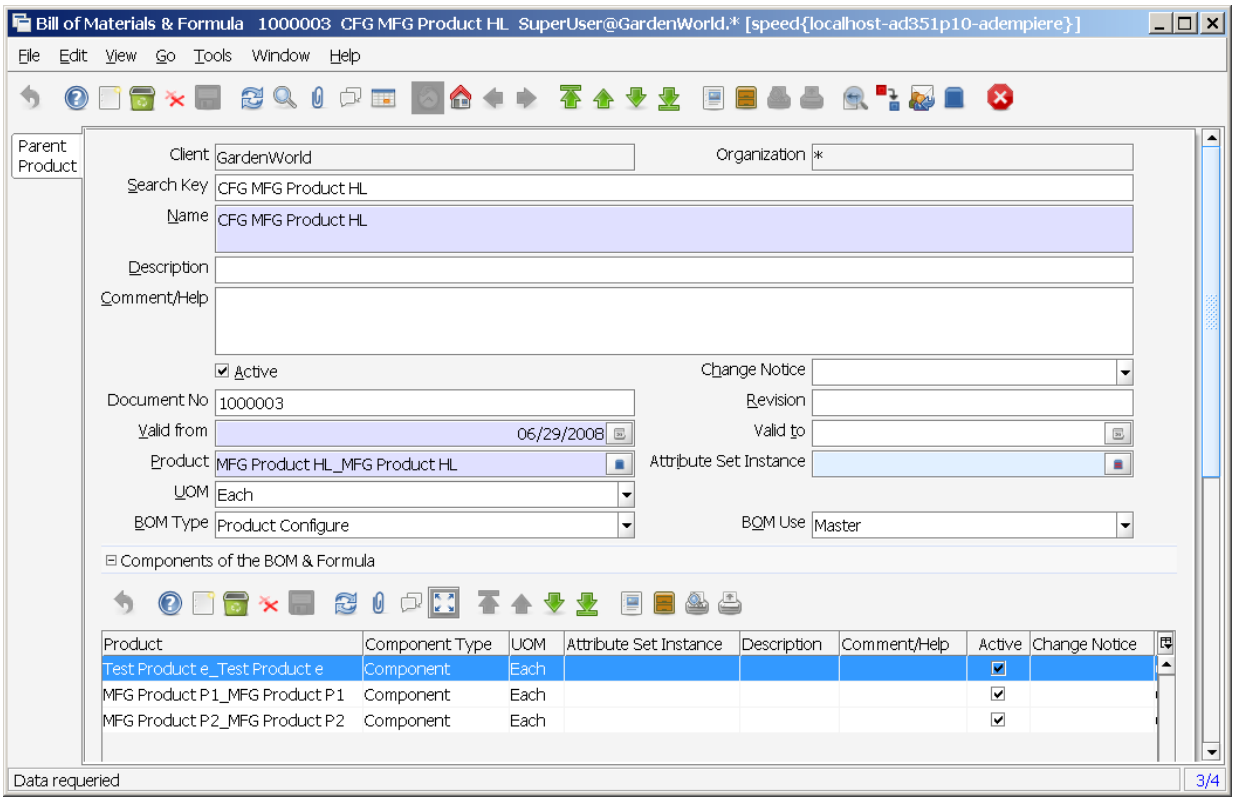


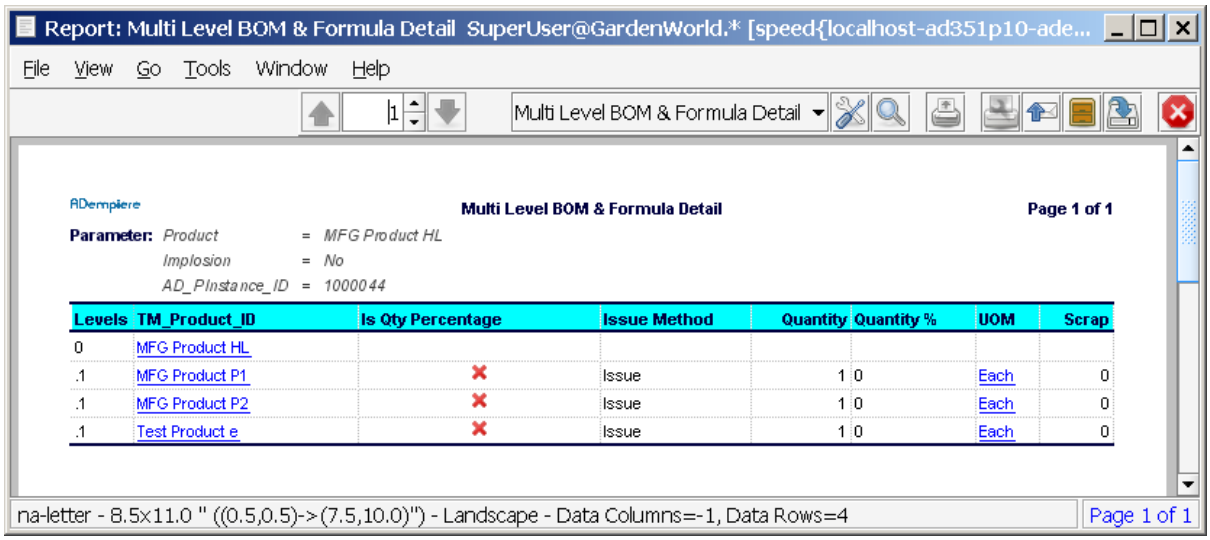




Right now, I haven't seen levels .2, even if tested with multi-level BOMs.

Multi Level BOM Sample





Still in error. Mit freundlichen Grüßen Product P1 and P2 are also BOMs. A level 2 display is expected.

3.3.7 Component Types

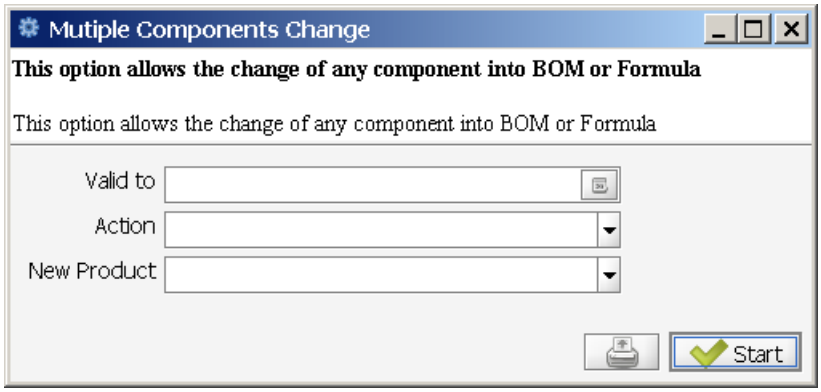
The following Component-Type values are defined:

- *COMPONENTTYPE_AD_Reference_ID*=53225;
- *COMPONENTTYPE_ByProduct* = "BY";
- *COMPONENTTYPE_Component* = "CO";
- *COMPONENTTYPE_Phantom* = "PH";
- *COMPONENTTYPE_Packing* = "PK";
- *COMPONENTTYPE_Planning* = "PL";
- *COMPONENTTYPE_Tools* = "TL";
- *COMPONENTTYPE_Option* = "OP";
- *COMPONENTTYPE_Variant* = "VA";

3.3.8 Multiple Components Change

- Org.evolution.process
  - `public class ComponentChange extends SvrProcess`
    - p_Action = A (add)
    - p_Action = D (deactivate)
    - p_Action = E (expire)
    - p_Action = R (replace)
    - p_Action = RE(replace & expire)

The real meaning of this function isn't actually clear to the author.



3.3.9 Product Configuration BOM

Menu: Manufacturing Management < Engineering Mangement < Bill of Material & Formulas < Product Configuration BOM (known as BOM Drop function)

Before dropping a BOM into a sales order (SO), it is necessary to create a non-complete SO (Standard Order with DocNo:50000_0) with just the Order and no order-line. The Order Line will be set due to the execution of this function. The _0 for DocNo 50000_0 does mean, that there i a cost value of 0.

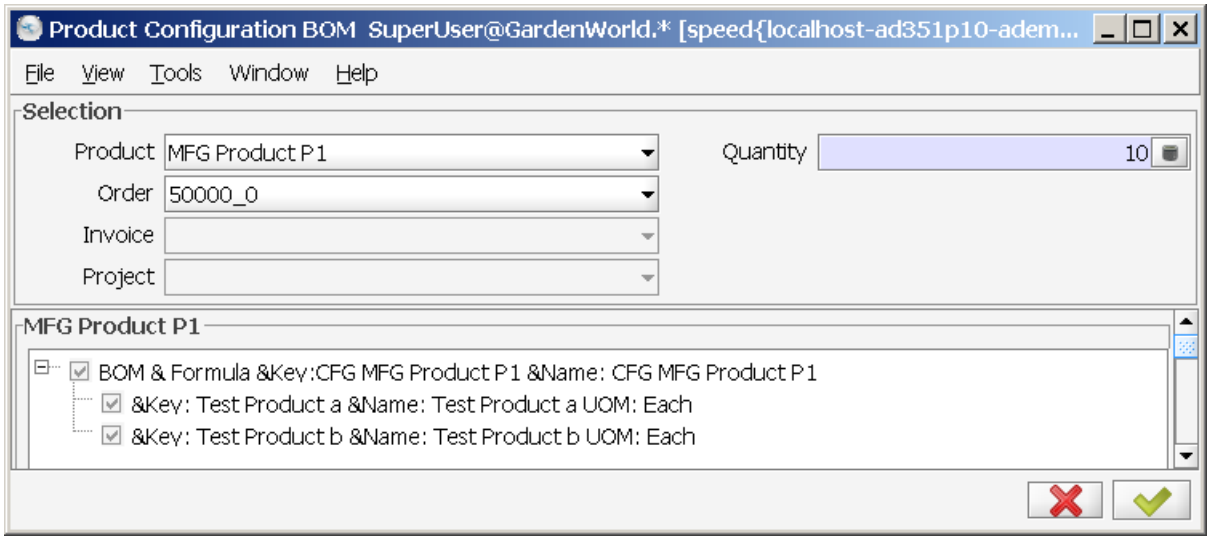
The Product Configuration BOM is only visible, when the BOM product has been be verified and the BOMTYPE=ProductConfigure and BOMUSE=Master.

BOMTYPE and BOMUSE combinations and their meaning.

Vn = Valid n (--> Rule n and Meaning), I = Invalid , U = Unknown

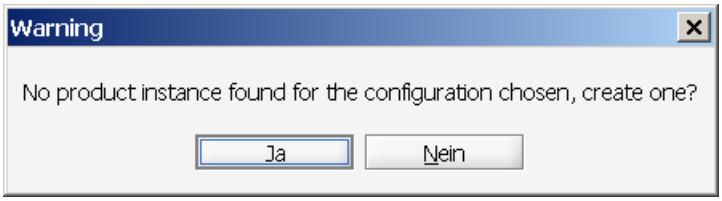
BOM Type/Use	Master	Engineering	Manufacturing	Planning	Quality
Current Active	V1	U	U	U	U
Make to Order	U	U	U	U	U
Previous	U	U	U	U	U
Previous Spare	U	U	U	U	U
Future	U	U	U	U	U
Maintenance	U	U	U	U	U
Repair	U	U	U	U	U
Product Configure	U	U	V2	U	U

- V1 = Default
- V2 = Required for



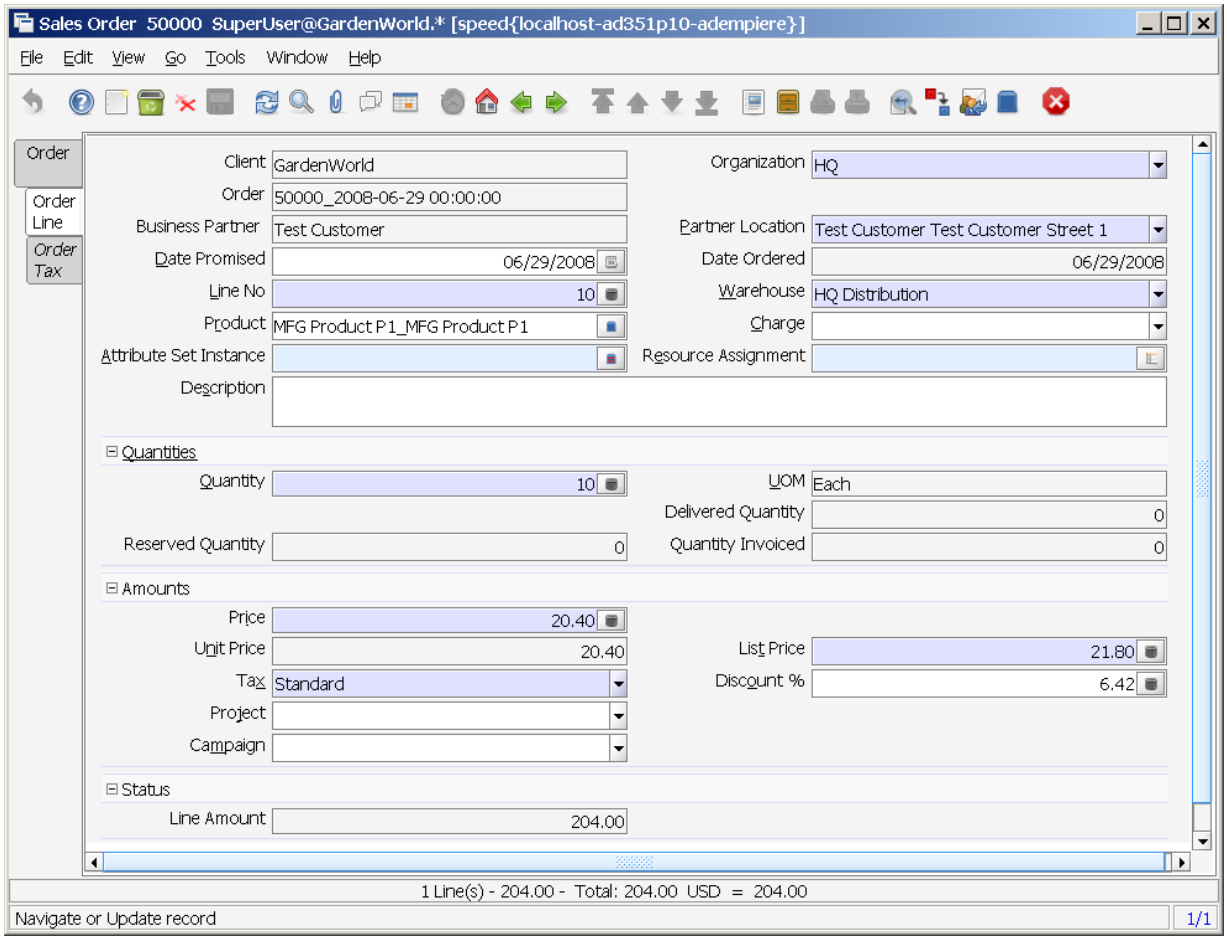
After hitting the OK Button, the following warning is displayed. The warning tells the user, that

there is no OrderLine right now, and ask if to proceed (ja = yes / German Windows Language) or nein = no. We continue with JA.



Without any further message (this is not user friendly) the process ends. We have to verify, that the SO 50000 has now an Order Line added.

We will see, that the quantity of 10 Products has been taken into account, calculated correctly. The Sum is added to this Order Line.



4 Planning Management

Before the manufacturing process will be started, it is necessary to plan all activities which are required to deliver all required components and material in time. Planning Management does answer the question: What is the optimal input for manufacturing to fullfil sales orders in time and keep warehosue costs at a minimum.

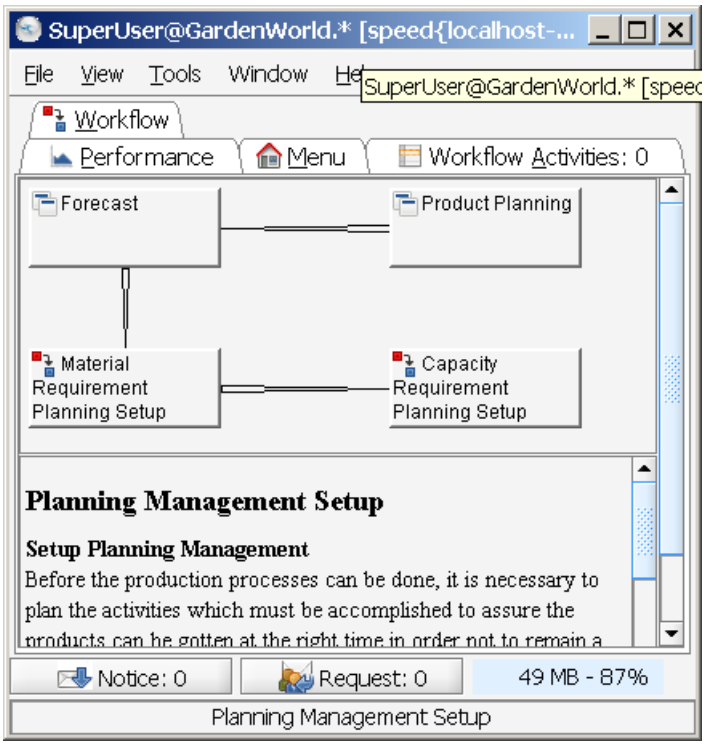
Another subject to take into account are the production cost and the capacity of shipping good quality products.

Using Production Planning you answer the question: When and How Many products we must get?

4.1 Planning Management Setup

Menu: Manufacturing Management < Planning Management < Planning Management Setup

The Planning Management Setup provides an overview about the required actions.



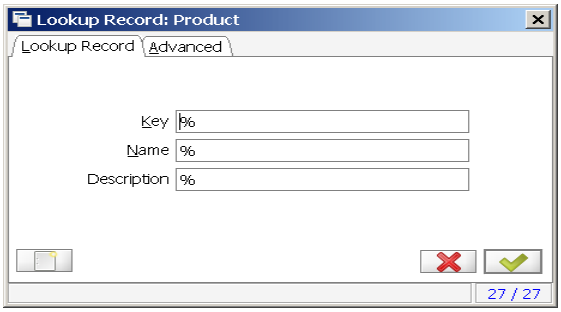
Before the production processes can be started, it is necessary to plan the activities which must be accomplished to assure that the products are available at the right time, in ordered quantity and quality. This is necessary in order to keep cost at a minimum and keep the manufacturing going.

4.2 Product Data Planning

Additionally to the data loaded in the Product window, where the characteristics of each product are defined, in the Window Product Planning you enter the product information which will serve as a base to execute the algorithms of Material Requirement Planning, along with PMP, open orders and inventories.

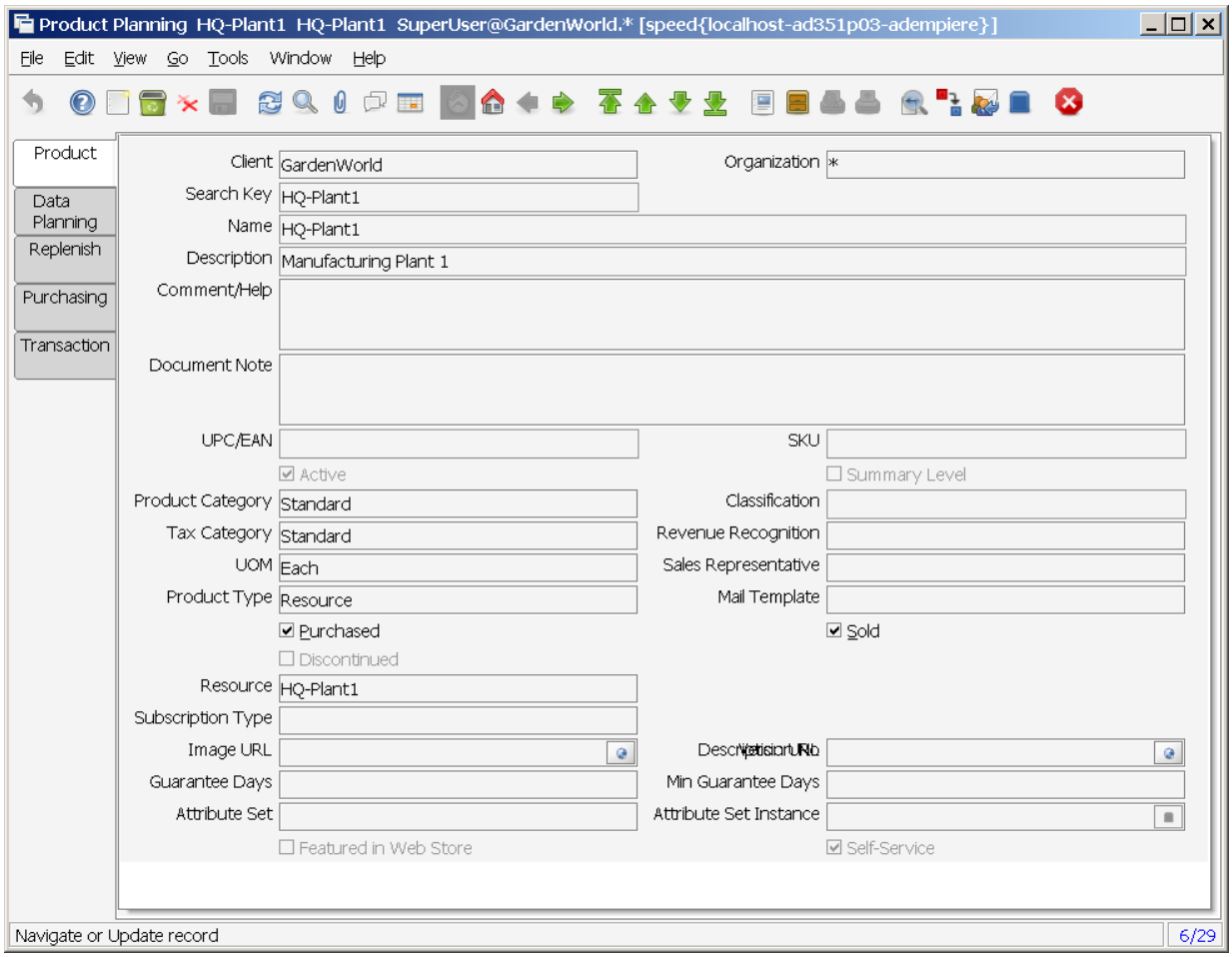
4.2.1 Product Planning

Menu: Manufacturing Management < Planning Management < Product Data Planning < Product Planning.

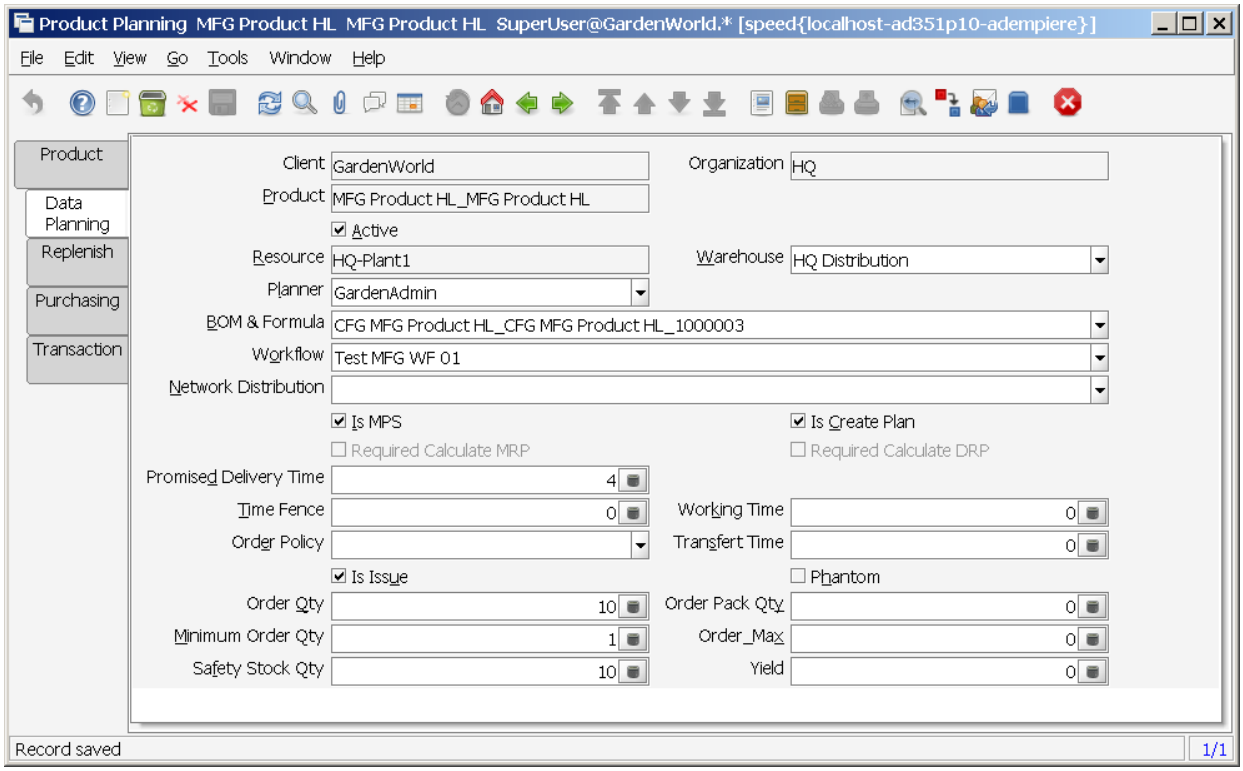


4.2.1.1 Tab: Product

In the Tab: Product you can enter the following fields:



4.2.1.2 Tab: Data Planning



In the Tab: Data Planning you can enter the following fields:

- Warehouse: place where you locate and control the products
- Resource: A manufacturing resource is a place where a product will be made.
- BOM & Formula:
  - This field will be considered the default BOM to produce the product in this Organization-Plant-Warehouse.
  - If you do not fill this field the default BOM & Formula for the entity will be the BOM/ Formula which has the same name as the product.
- WorkFlow:
  - The Workflow you introduce in this window will be considered the default Workflow to produce the product in this Organization-Plant-Warehouse.
  - If you do not fill this field the defaul t Workflow for the entity will be the Workflow with the same name as the product.
- *Is MPS*

  ☑ You indicate the product in this Organization-Plant-Warehouse can satisfy a demand from the Master Production Schedule
- *Is Create Plan*

  ☑ indicates MRP must create planned orders for this Product-organization-warehouse (HQ-Warehouse)

  ☐ Need to use the Tab: Replenishment and control the inventory level using the Replenish

Report.

- *Required Calculate MRP*

  ☑ Indicates a change in some element which affect the MRP Calculation for this product, i.e BOM, Orders, Inventory, PMP, etc. and therefore you need to recalculate the MRP to adjust the Planned Orders to the new conditions and to get the updated action messages.

  ☐ No recalculation done.

- The Time Fence is the number of days since you execute the MRP process inside of which the system must not change the planned orders. The system will generate action messages warning if some order needs to be modified or created into the time fence .
- In the Promised Delivery Time field you must enter the average number of days to receive the product in the warehouse since you approve the requisition or manufacturing order until you receive the material in the warehouse . If the product is bought you must register the calendar days required since you make the PO until you receive the material in the warehouse. If the product is manufactured in your plant you must register the number of working days since you release the MO until you receive the material in the warehouse.
- Transfer Time is the number of days the product needs to be moved from one warehouse to another.
- Order Policy is referred to the way MRP should adjust Planned Order to the Organization-Warehouse-Resource needs. The valid options are:
  - Fixed Order Quantity
  - Lot for Lot
  - Period Order Quantity
- Use Fixed Order Quantity when you always need to ask the same Quantity of product, this Quantity is entered in the field Order Qty.
- If the order policy is not FOQ and you enter a quantity in the Order Qty field, this quantity is the Economic Order Quantity.
- The Lot for Lot Policy means MRP process must generate one planned order for each demand not satisfied.
- The Period Order Quantity policy refers to the way MRP create one single planned order with every net requirements for a certain number of days. this days are entered in the field Order Period.
- *Is Issue*

  ☑ When this product is a component of a MO, it will be issued from the warehouse.

  ☐ This component will be taken from the shop floor inventory.

- *Is Phantom*

  ☑ Indicates the product is a virtual assembly, that is to say when the MRP require a phantom and it is on hand MRP take it as a supply but if the on hand quantity required is not complete, instead of generate a planned order for this phantom product MRP look for the components and continue the process

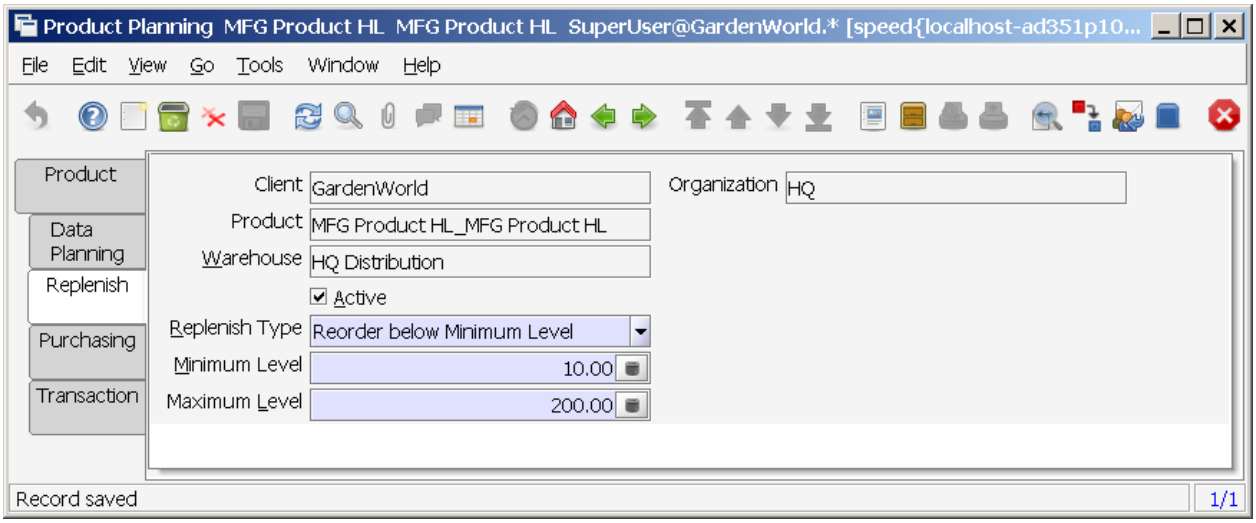
  ☐ ?

- If amount is registered in Order Qty is indicated that this is the economic batch size.

- When you enter a quantity in the Order Pack Qty field, the Planned orders should be created in multiples of this quantity. , this is useful when the vendor only sells fixed quantities of products or when by effects of the MRP calculation you get fraction of products which must be gotten in integer quantities.
- Minimum Order Quantity is used when the orders should be done at least for this quantity because of vendor policies or fabrication limitations. The MRP process will use this quantity when the calculated planned order is for a smaller quantity than the Minimum Order Quantity then MRP creates the planned order for the Minimum Order Quantity. The system generates a message warning this quantity change.
- Order max is the maximum order quantity and it is used when the orders should be done at the maximum for this quantity because of vendor policies or warehouse limitations. The MRP process will use the quantity calculated to create the planned order but generates a message warning the quantity is greater than the maximum quantity.
- In the field Working Time you enter the accumulated time (using the Promising Delivery Time) in the critical path of the BOM for this product. It is the required time to produce the product as if you would not have any component on hand.
- In the Yield field enter the percentage of the product you expect will satisfy the QA specifications vs the total quantity to be produced.
- The remaining tabs are part of the ADempiere Product window please refer to the Reference Manual.

4.2.1.3 Tab: Replenish

Depends on *Tab:Data Planning* - ☑ *Is create Plan*

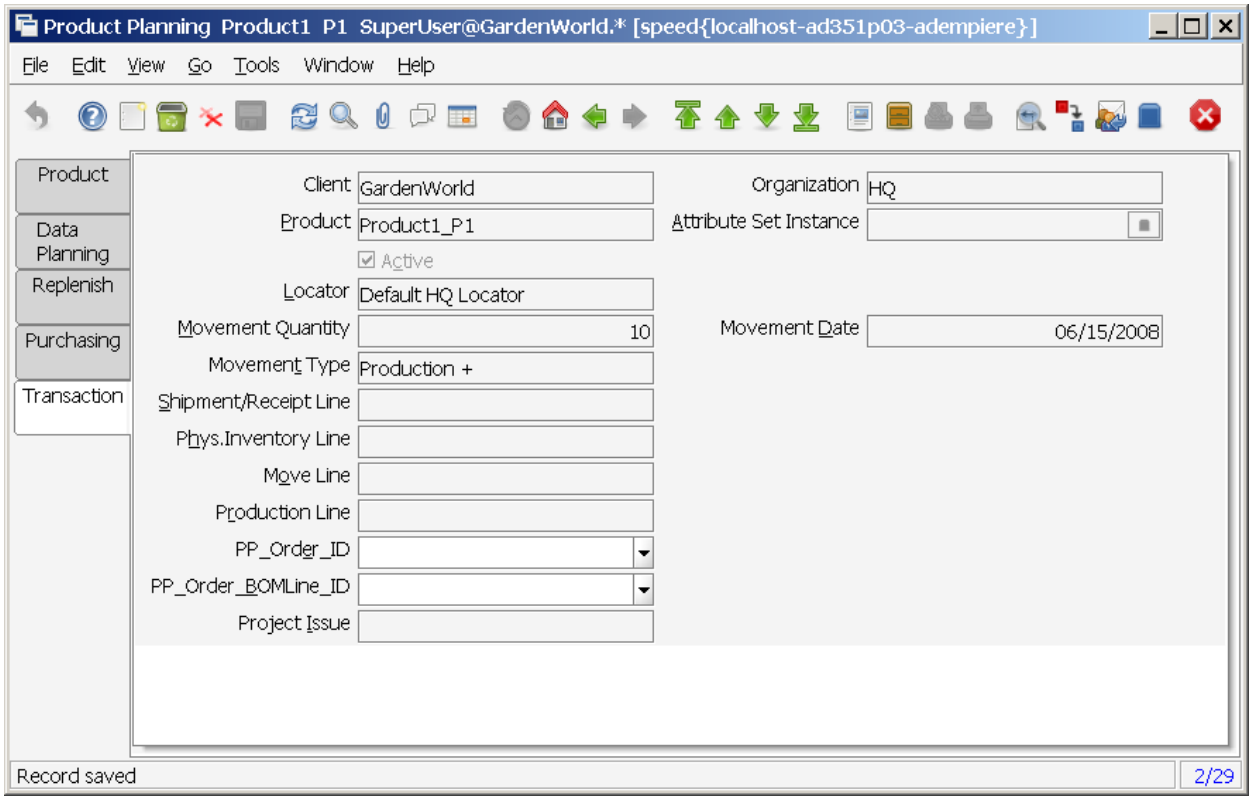


4.2.1.4 Tab: Purchasing

Depends on *Tab:Data Planning* - ☑ *Is create Plan*.

4.2.1.5 Tab: Transaction

TBD.

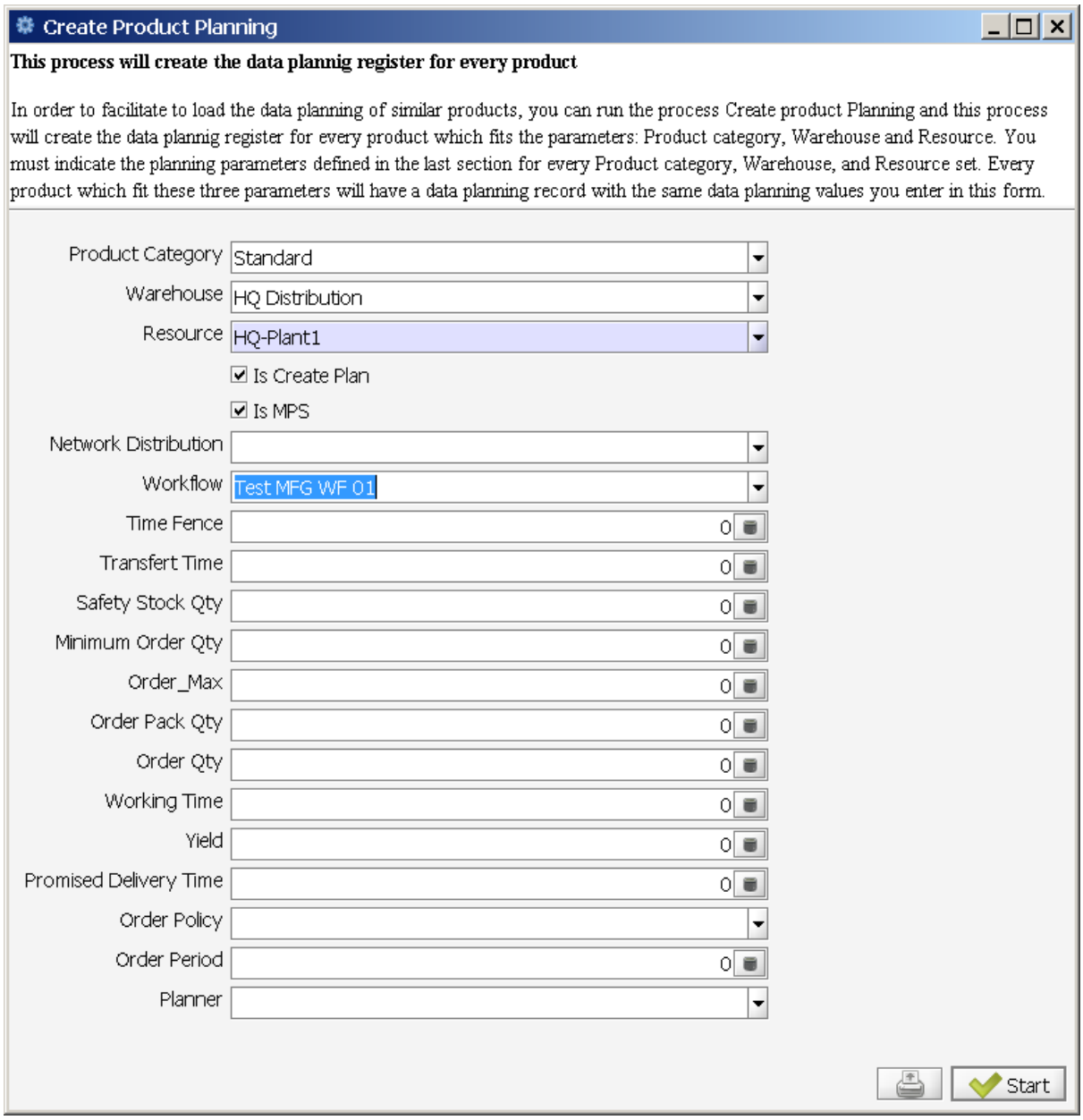


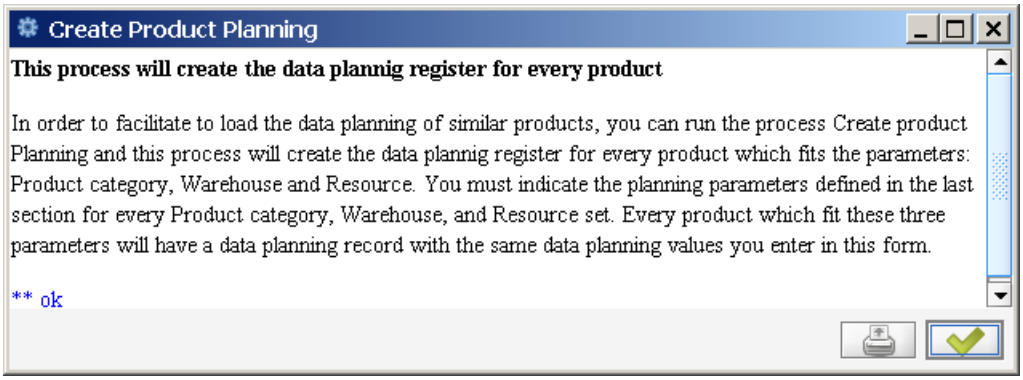
4.2.2 Create Product Planning

In order to facilitate to load planning data of similiar products, one can run teh process „Create Product Planning“ and this process will create the data planning register for every product, which fits the parameters: Product Category, Warehouse and Resource. One must indicate the planning parameters defined in the last section for every Product Category, Warehouse and Resource Set. Every Product which does fit with these three parameters will hava a data planning record with the same data planning values you enter in this form.

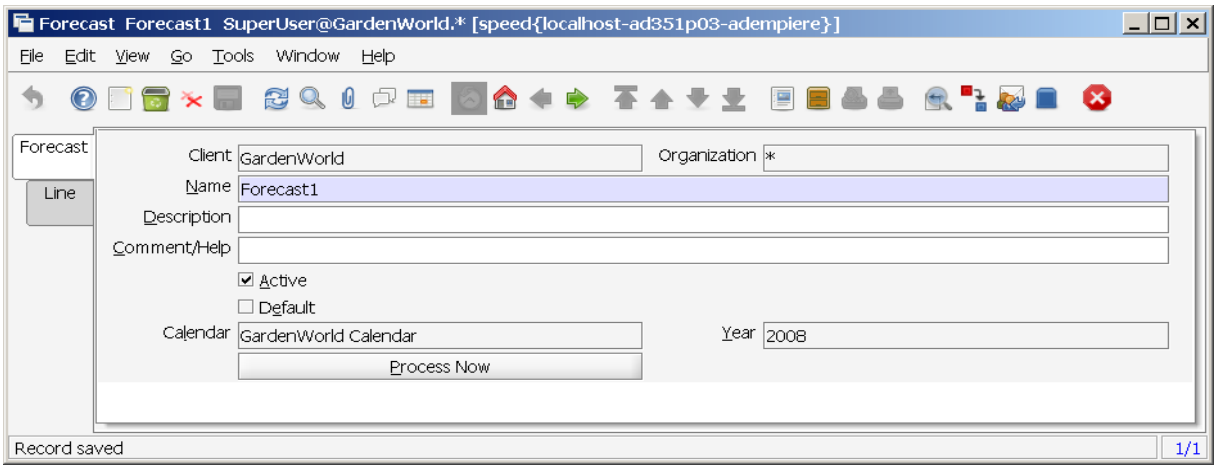
You must indicate the planning parameters defined in the last section for every Product category, Warehouse, and Resource set. Every product which fit these three parameters will have a data planning record with the same data planning values you enter in this form.

The meaning of the fields are explained in the previous section of this Chapter.


Create Product Planning
This process will create the data plannig register for every product
In order to facilitate to load the data planning of similar products, you can run the process Create product Planning and this process will create the data plannig register for every product which fits the parameters: Product category, Warehouse and Resource. You must indicate the planning parameters defined in the last section for every Product category, Warehouse, and Resource set. Every product which fit these three parameters will have a data planning record with the same data planning values you enter in this form.
Product Category
Standard
Warehouse
HQ Distribution
Resource
HQ-Plant1
Is Create Plan
Is MPS
Network Distribution
Workflow
Test MFG WF 01
Time Fence
Transfert Time
Safety Stock Qty
Minimum Order Qty
Order_Max
Order Pack Qty
Order Qty
Working Time
Yield
Promised Delivery Time
Order Policy
Order Period
Planner
Start

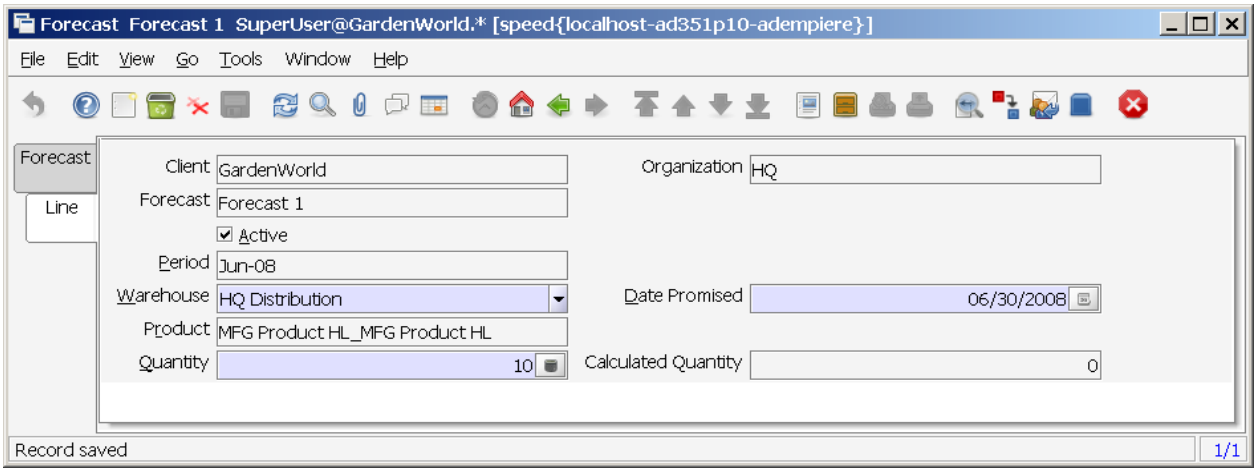

Create Product Planning
This process will create the data plannig register for every product
In order to facilitate to load the data planning of similar products, you can run the process Create product Planning and this process will create the data plannig register for every product which fits the parameters: Product category, Warehouse and Resource. You must indicate the planning parameters defined in the last section for every Product category, Warehouse, and Resource set. Every product which fit these three parameters will have a data planning record with the same data planning values you enter in this form.
** ok

4.2.3 Forecast



What will happen when Button Process Now is clicked ? --- nothing I can see right now.

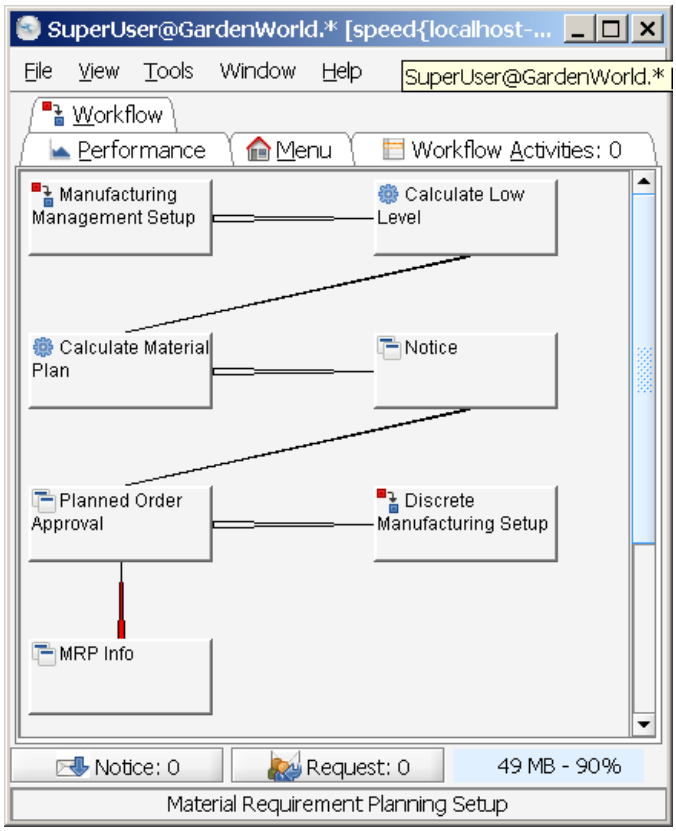
I think the result can be seen in MRP Info as FCT (Forecast).



4.3 Material Resource Planning – MRP

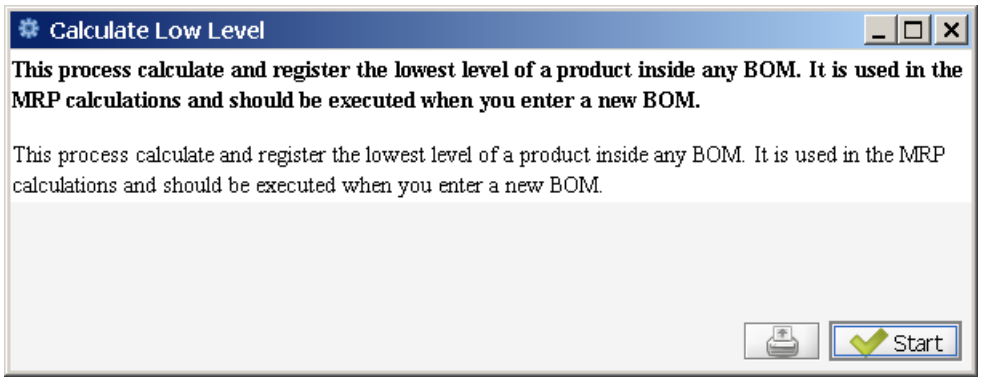
MRP is a set of techniques which uses Bills of Meterial, Inventory Data and Master Production Schedule (MPS) to calculate requirements for materials. It does create planned manufacturing orders to balance demand and supply for products and it does issue recommendations to receipt material with the right quantities and just in time to satisfy the MPS in teh most efficient way.

4.3.1 Material Requirement Planning setup



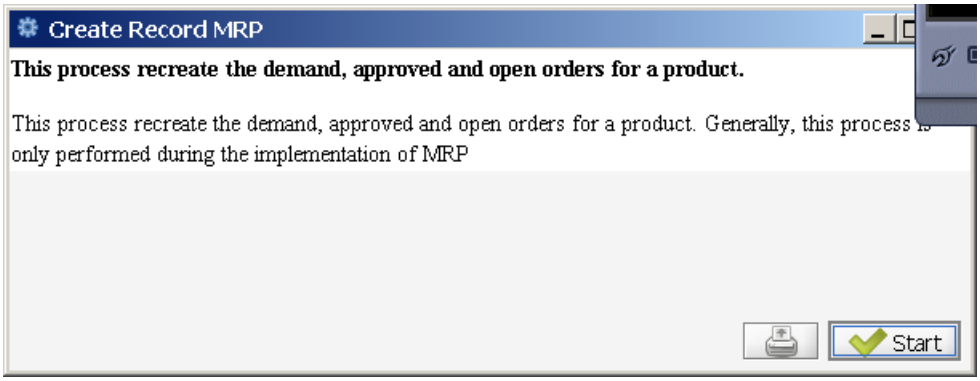
4.3.2 Calculate Low Level

This process calculate and register the lowest level of a product inside any BOM. It is used in the MRP calculations and should be executed when you enter a new BOM.



4.3.3 Create Record MRP

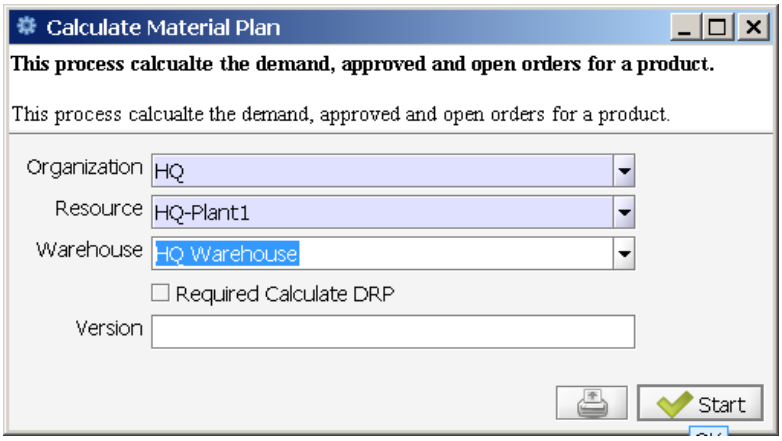
This process recreate the demand, approved and open orders for a product.



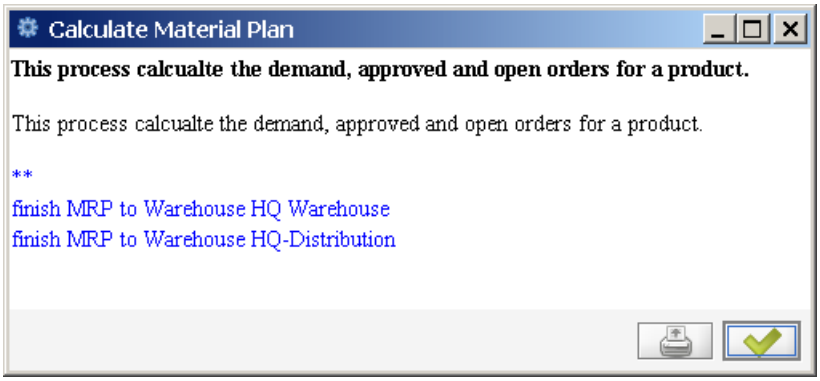
4.3.4 Calculate Material Plan

Menu: Manufacturing Management < Planning Management < MRP

Click the option **Calculate Material Plan** to start the calculation. A dialog box is displayed informing the process of data global load is going to start.



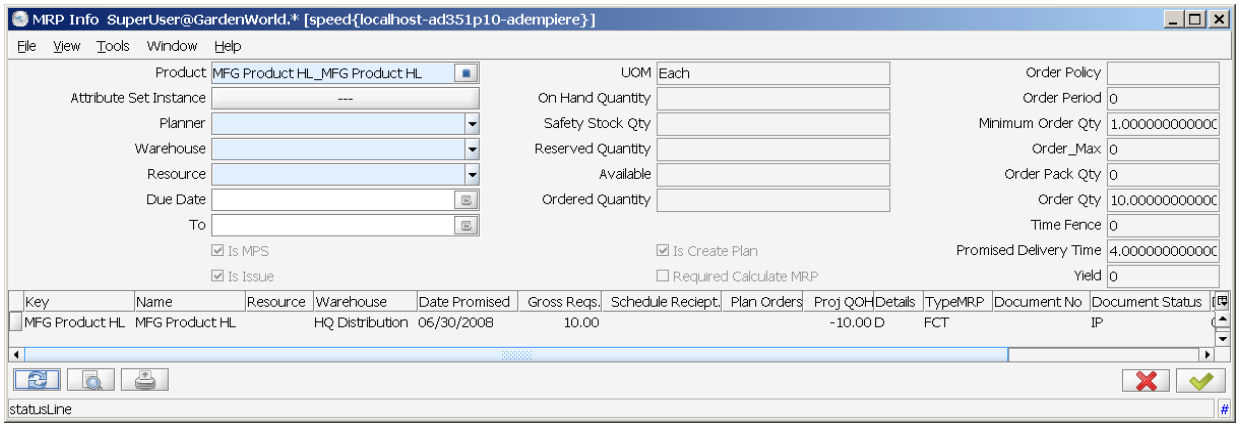
When selecting  the following window will appear. Actually there is no plan.



It is displayed a form which ask you to enter the Organization for which you wish to make a material plan and the version of this plan. You can have several versions in such a way you can decide the most convenient version you want to use.

4.3.5 MRP Info

Menu: Manufacturing Management < Planning Management < MRP < MRP Info



PatioSet has TypeMRP = FCT (Forecast). On Lookup Record the result is seen in chapter 4.2.4.

In the heading you enter the Product, Plant, Warehouse and the period of time when you want to inquiry the demands and supplies. As usually if you left blank a parameter all the possibilities will be considered.

Then you press the refresh button and two sets of data are displayed: In the upper panel the product planning data and the product on hand are displayed. In the lower one are shown the information around the Manufacturing Resource where the product will be made, the demand and supply Warehouse and the information for both documents of demand and supply.

The fields shown are:

- The Gross Requirements are the Demand quantity. The demand source can be an Independent demand (Sales Order, Forecast) or the components required for a manufacturing order (dependent demand).
- Date Promised is the due date for the demand or supply.
- Scheduled Receipts shows the supply orders quantities which will be receipted with its due date. The source of the scheduled receipts can be an open purchase order, a requisition, an open manufacturing order or any planned order.
- The Projected Quantity On Hand is calculated from the starting on hand showed in the heading adding the supplies and subtraction the Gross Requirements. Negative quantity on hand indicates is necessary to generate a planned order to satisfy the demand in such a way at the end of the MPS the projected quantity on hand must be at least zero.
- The Details column has two possible entries, D and S. D indicates the order generates a demand (the product is a component of a MO, a product of a SO line or a forecast line). A S code indicates the order generates a supply (the product is a finished product of a MO, a product included in a PO line or a requisition).
- The Type column indicates the type of demand or supply, the valid types are:
  - SOO – Sales Order, Open
  - POO – Purchase Order, Open
  - POR – Purchase Requisition
  - MOP – Manufacturing Order Planned

- The Order Column shows us the Order Document Number
- The possible States of the Order are:
  - DR – Draft
  - NA – Not Approved
  - IP – In Process (Firm Planned)
  - CO – Complete
- Manufacturing Resource-Type
  - *MANUFACTURINGRESOURCETYPE_AD_Reference_ID=50008;*
  - *MANUFACTURINGRESOURCETYPE_ProductionLine = "PL";*
  - *MANUFACTURINGRESOURCETYPE_Plant = "PT";*
  - *MANUFACTURINGRESOURCETYPE_WorkCenter = "WC";*
  - *MANUFACTURINGRESOURCETYPE_WorkStation = "WS";*

4.3.6 Action Messages

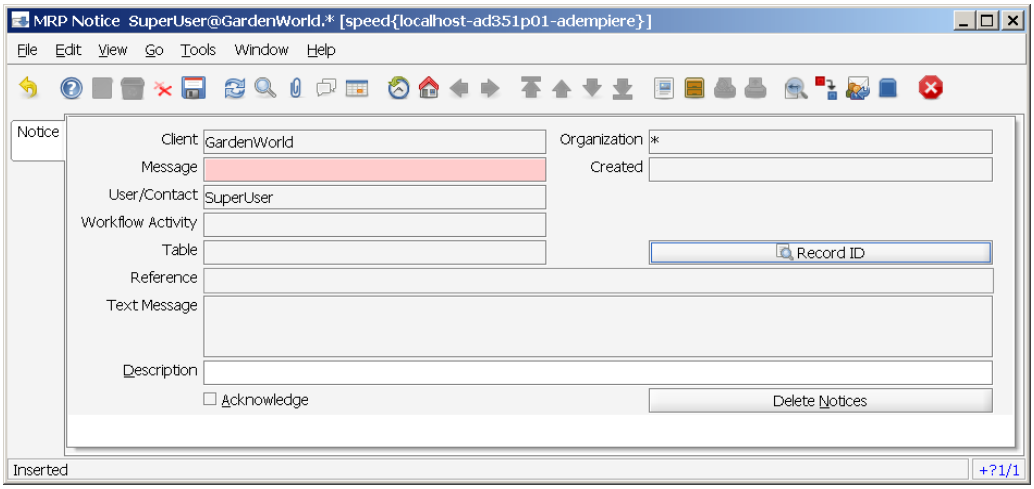
It is a group of messages generated for the MRP process. It indicates to the scheduler the actions he needs to do to reach the Master Production Schedule. The action messages are set as notices for the planner when he sign up the Compiere session.

The possible action messages are:

MRP Code	Action Message
MRP - 001	Beginning Quantity Less Than Zero.
MRP - 020	Create - A Supply Order should be created to satisfy a negative projected on hand balance. This message is only generate if Create Plan is No or if a new requirement appears the time fence.
MRP - 030	De Expedite - Indicates that a scheduled supply order is due before it is needed and should be delayed, or demand rescheduled to an earlier date.
MRP - 040	Expedite - Indicates that a scheduled supply order is due after is needed and should be rescheduled to an earlier date, or demand rescheduled to a later date.
MRP - 050	Cancel - Indicate that a scheduled supply order is no longer needed and should be deleted.
MRP - 060	Release Due For - Indicate that a schedule order should be released.
MRP - 070	Release Past Due For - Indicate that a supply order was not released when it was due, and should be either released or expedited now, or the demand rescheduled for a later date.
MRP - 080	Quantity Less than Minimum - Indicates that a supply order was created for a quantity less than the minimum quantity set in the product planning
MRP - 090	Quantity Less than Maximum - Indicates that a supply order was created for a quantity for a quantity greater than than maximum quantity set in the product planning
MRP - 100	Past Due Time Fence - Indicates that there is an unsatisfied material requirement inside the planning time fence for this item. You should either manually schedule and expedite orders to fill this demand or delay fulfillment of the requirement that created the demand.
MRP - 110	No exists Demand Warehouse - indicates that the product planning is not set Demand
MRP - 120	No exist supply warehouse - indicates that the product planning is not set supply

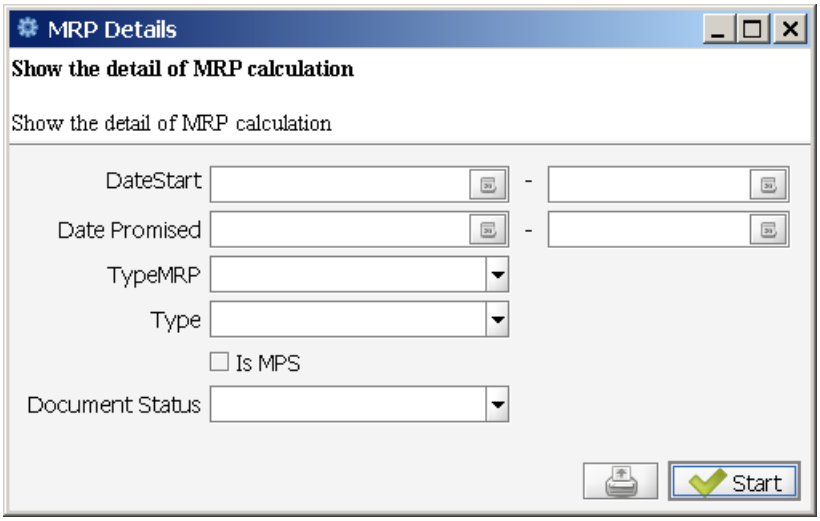
4.3.7 MRP Notice

Menu: Manufacturing Management < Planning Management < MRP < MRP Notice



4.3.8 MRP Details

Menu: Manufacturing Management < Planning Management < MRP < MRP Details



- DateStart
- Date Promised
- Type MRP
  - FCT
  - MOP
  - POO
  - POR
  - SOO

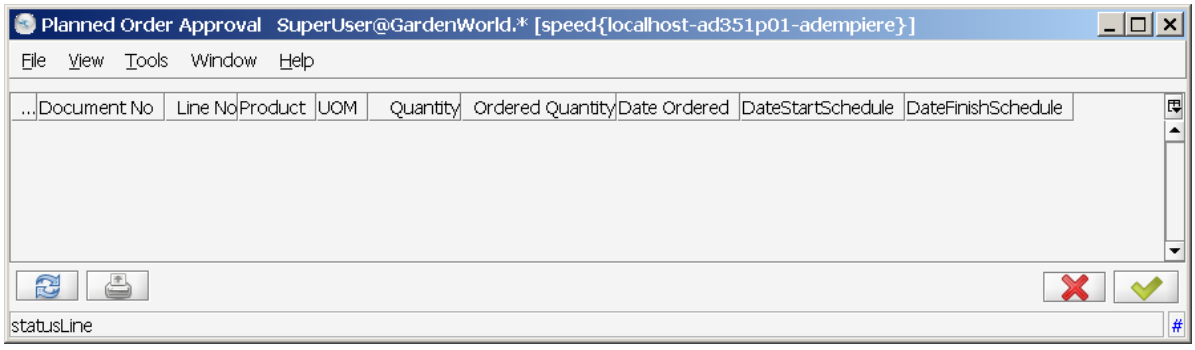
- Type
  - D – Order generates a Demand
  - S – Order generates a Supply
- isMPS
  - checked
  - unchecked
- Document Status
  - Approved
  - Closed
  - Completed
  - Drafted
  - In Progress
  - Invalid
  - Not Approved

4.3.9 Planned Order Approval

Menu: Manufacturing Management < Planning Management < MRP < Planned Order Approval

A planned manufacturing order is a manufacturing order suggested by the MRP process and contains its quantity and its release and promise dates. when you approve a manufacturing planned order you convert it in a manufacturing order with the status of *In Process*.

When you approve a planned order you are telling the system that the manufacturing order is ready to start its process with the approval you change the order status from *Draft* to *In Process*.



Actually there is an error when press the OK button.

4.4 Capacity Requirements Planning - CRP

Menu: Manufacturing Management < Planning Management < CRP

The process of Capacity Plan Calculation allows us to know the available time in each manufacturing resource, as well as teh required time to satisfy the Master Production Schedule (MPS). It is a set of techniques which uses the planned manufacturing orders by MRP, open manufacturing resources and the workflows to calculate the required time for each resource along

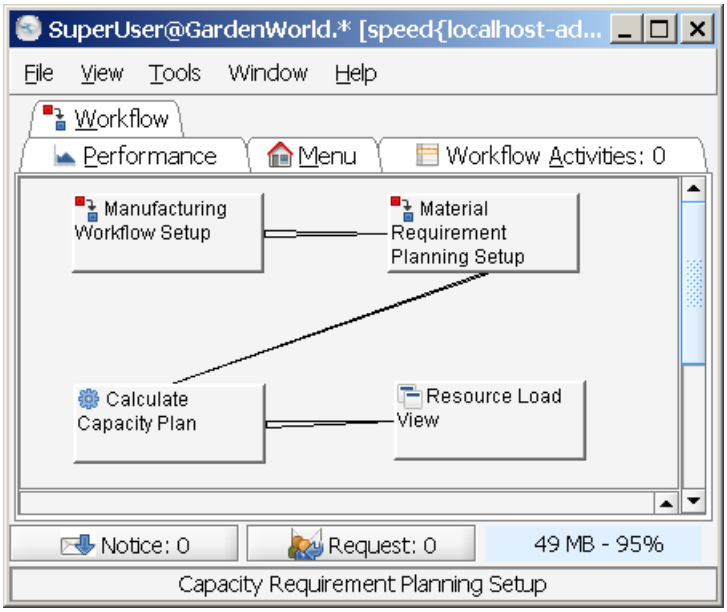
with the available time. With this information, we are able to balance teh time demand with the available time. Though the knowledge of the required and available capabilities it is possible to adjust the MPS until we arrive at a realistic time.

It is a set of techniques which uses the planned orders by MRP, open manufacturing orders, manufacturing resources and the work-flows to calculate the required time for each resource along with the available time. With this information, we are able to balance the time demand with the available time. Through the knowledge of the required and available capacities it is possible to adjust the **Master Production Schedule(MPS)** until we arrive at a realistic one.

CRP answers the question: Is the available capacity sufficient to satisfy the required time demand at each manufacturing resource?

4.4.1 Capacity Requirement Planning Setup

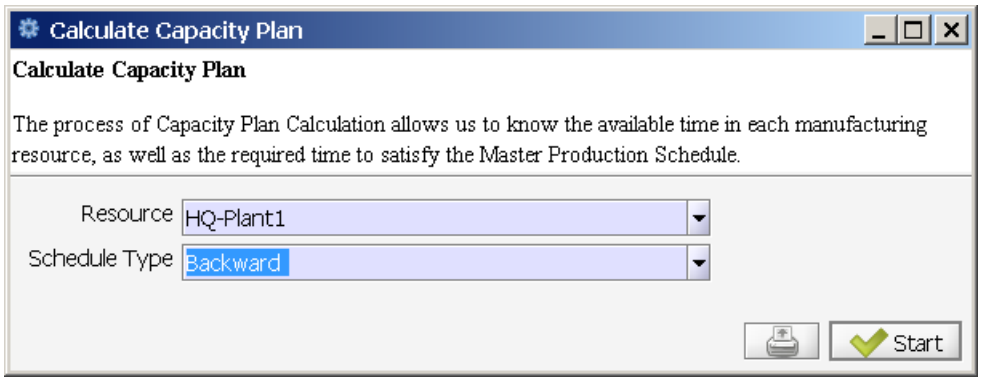
Menu: Manufacturing Management < Planning Management < CRP < Capacity Requirement Planning Setup

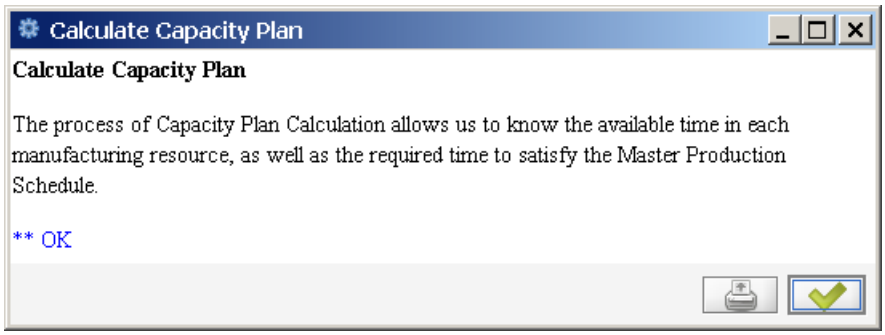


4.4.2 Calculate Capacity Plan

Menu: Manufacturing Management < Planning Management < CRP < Calculate Capacity Plan

The process of Capacity Plan Calculation allows us to know the available time in each manufacturing resource, as well as the required time to satisfy the Master Production Schedule.



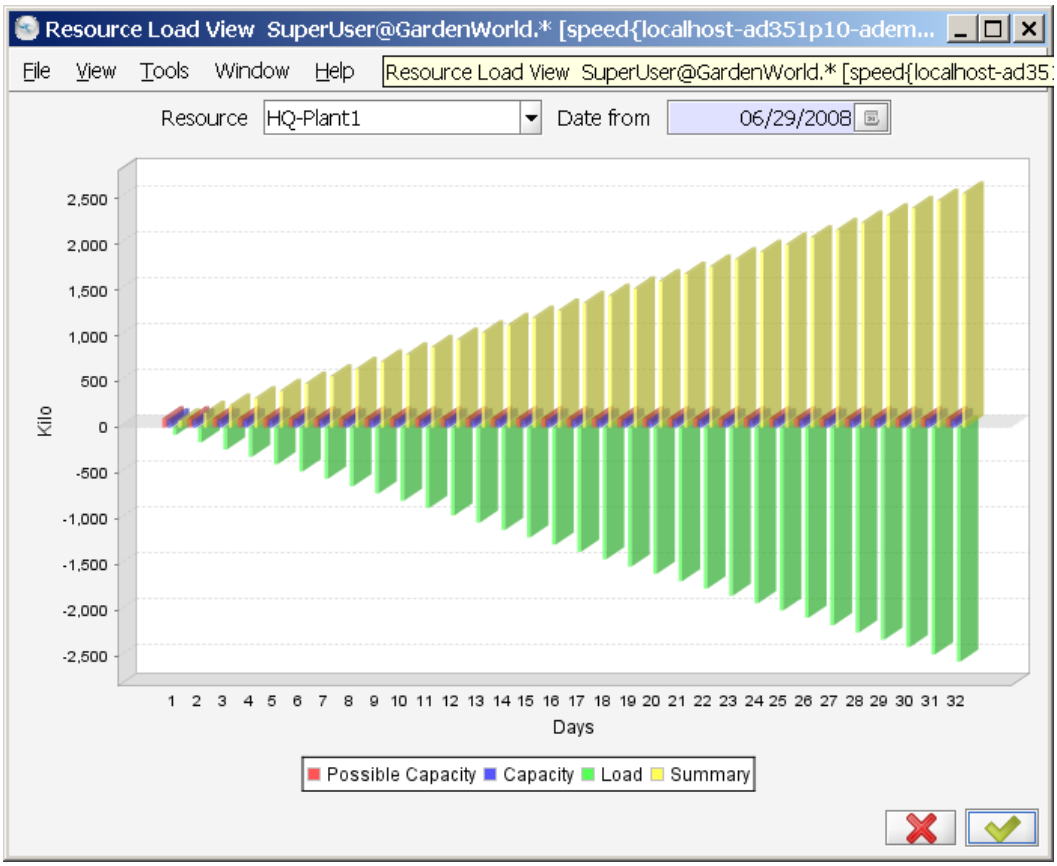


4.4.3 Resource Load View

Menu: Manufacturing Management < Planning Management < CRP < Resource Load View

It shows graphically of the required and available time for each manufacturing resource.

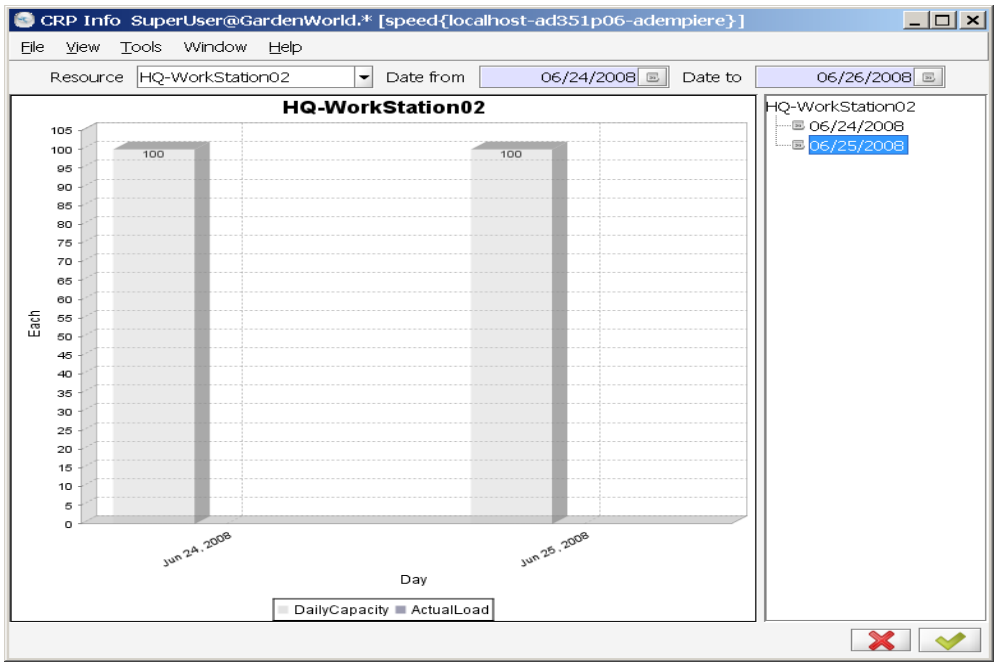
- The required parameters to get the Resource Load View are:
  - the resource you want to analyze and the date at the beginning of the month you wish to analyze.
  - Next click the OK button and you will see the daily available capacity at the selected resource. The bar of the graph shows the required capacity, the available capacity and the difference between them.
  - The accumulated times from other periods are not considered for these calculations.



The Resource Load View result Looks strange.

4.4.4 CRP Info

Menu: Manufacturing Management < Planning Management < CRP < CRP Info

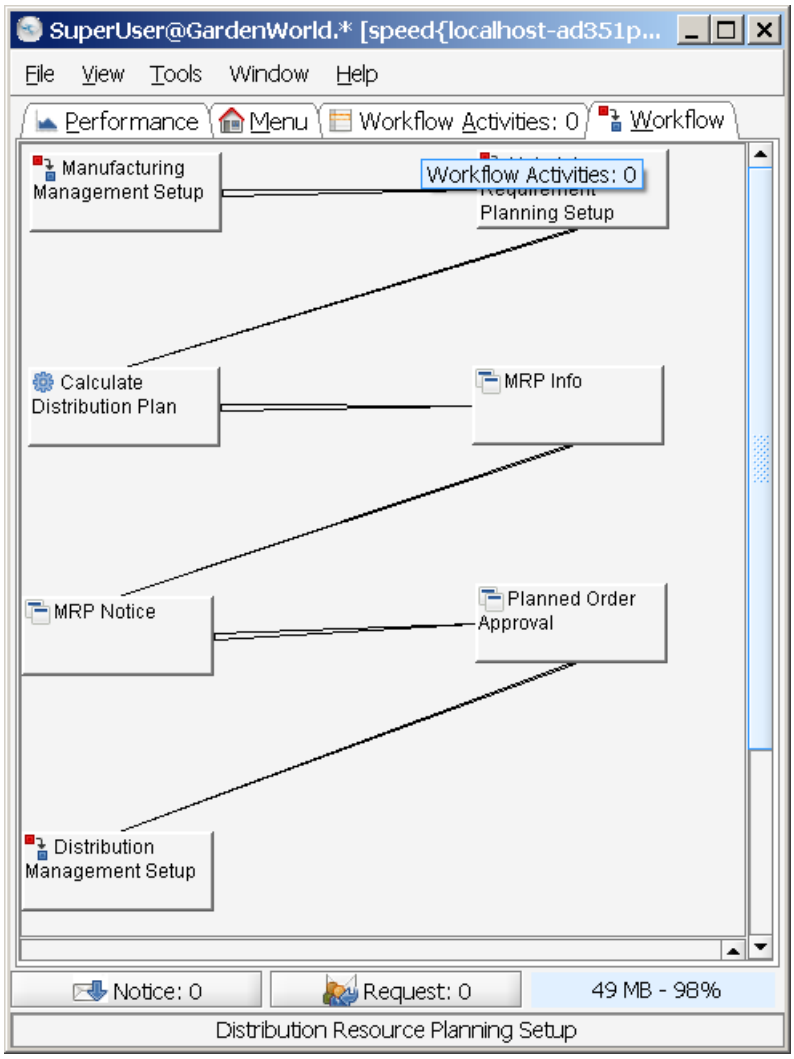


The CRP Info Report gives an overview of the actual load capacities on the various manufacturing resources.

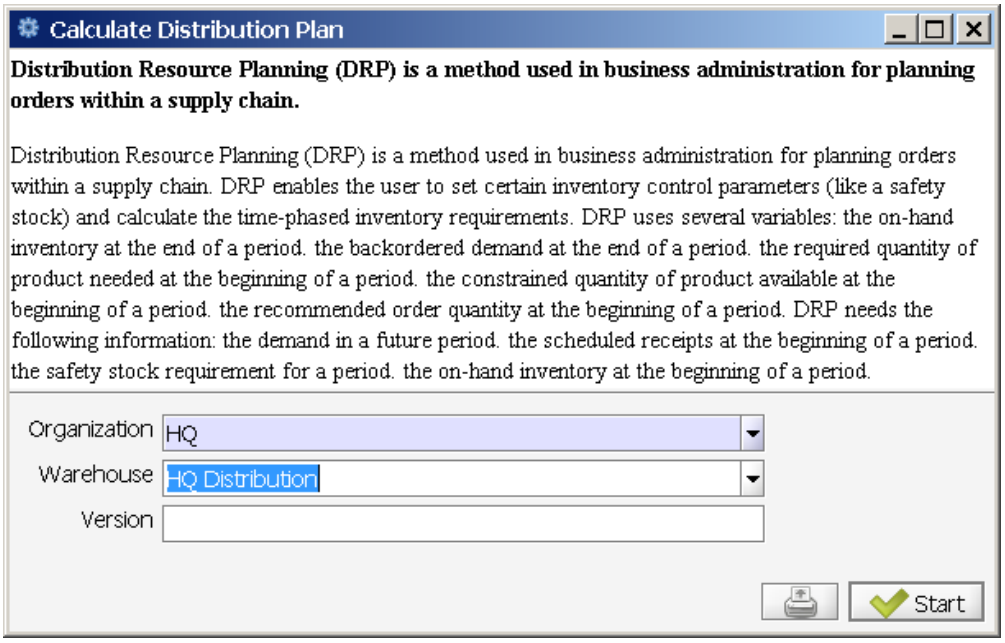
4.5 Distribution Resource Planning - DRP

Distribution planning does support supply chain aspects. It takes in account the various demand from SO, PO and MO to provide the optimal availability to deploy (ATD).

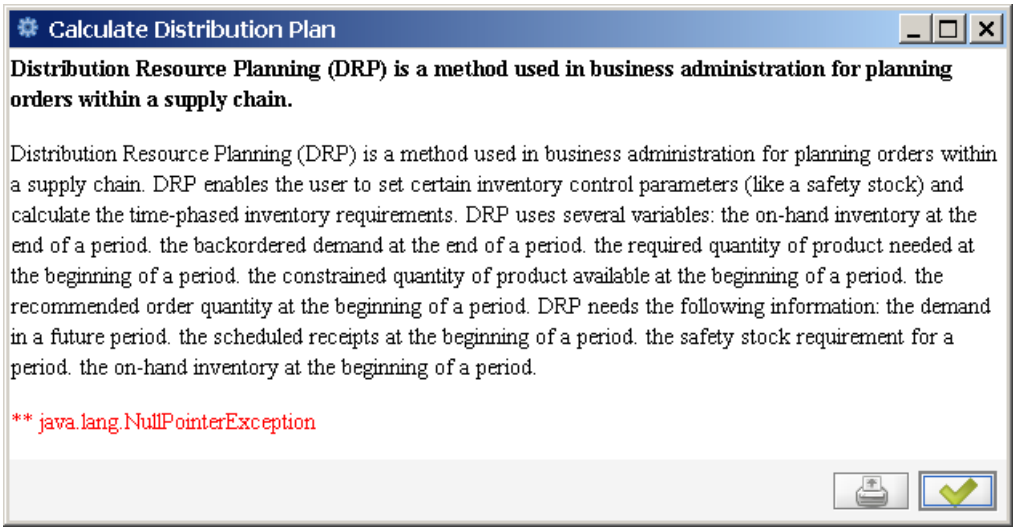
4.5.1 Distribution Resource Planning Setup



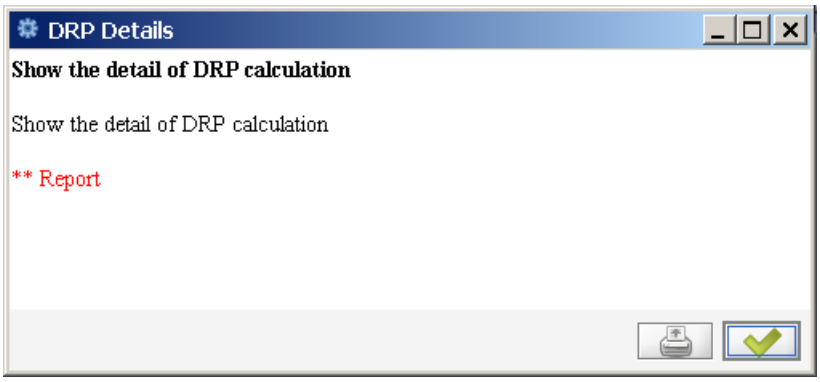
4.5.2 Calculate Distribution Plan



And as a result



4.5.3 DRP Details



5 Production Management

Once the production planning process has been executed, the production control process let us to check the execution activities in order to be sure we can reach the material plan.

Each time you need to release an order you need to be sure the components are complete in the warehouse, this can be obtained tracking the release and due dates for every component, this is easy to get using the shortage reports and from this module.

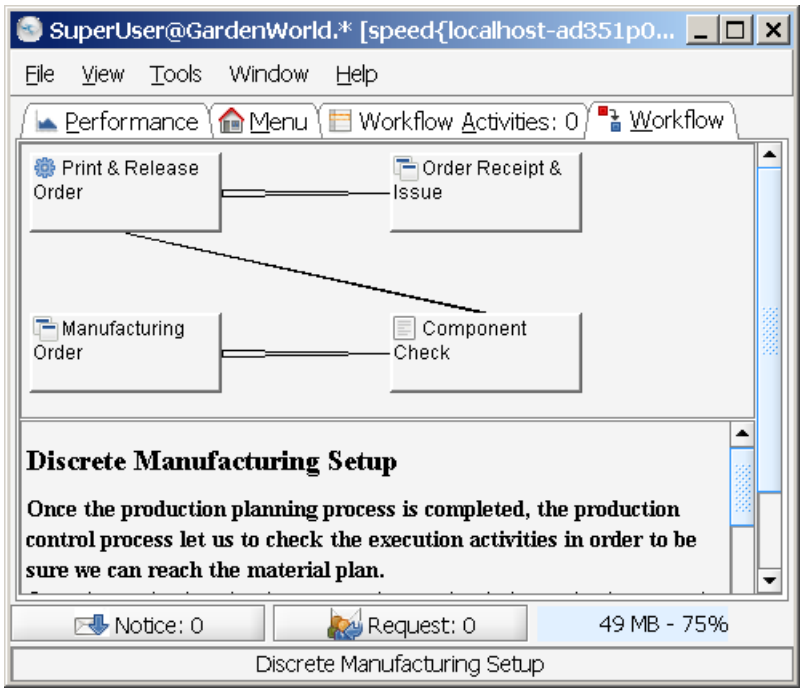
This module mainly answer the question: What do I need to do to accomplish the MPS?

...and If you have are in trouble and you can not cover the MPS as you had planned, this module gives you information to decrease the effect on the costs and on the customer service.

5.1 Discrete Manufacturing

5.1.1 Discrete Manufacturing Setup

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Discrete Manufacturing Setup



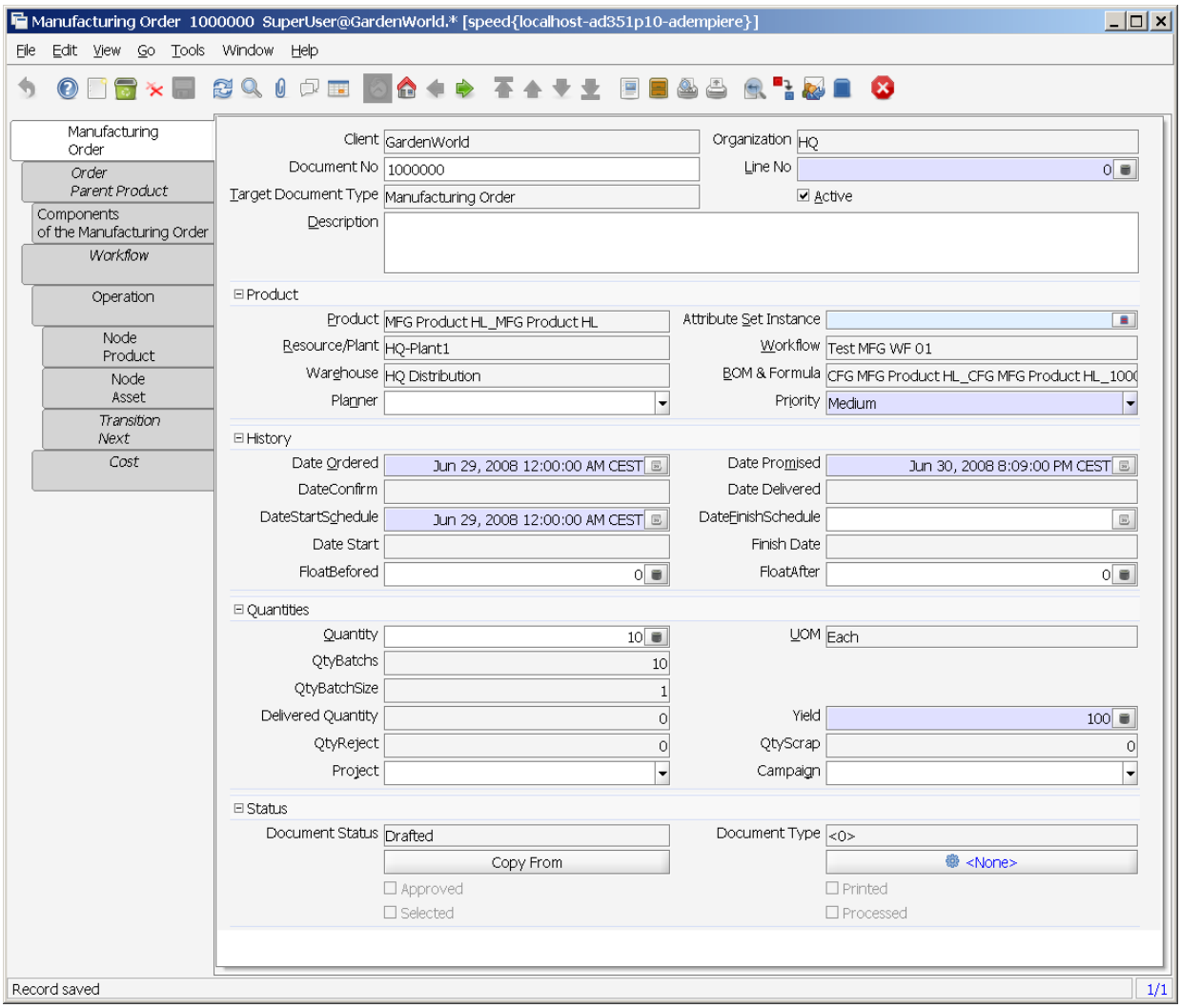
Manufacturing Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order

The Manufacturing Order is a document or schedule identity conveying authority for the manufacture of specified products in specified quantities.

5.1.1.1 Tab: Manufacturing Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order



- Date Ordered – is the date when the order was generated. If the MO is created manually the default date ordered is the system date. If the MO was generated by MRP the default date ordered is the day of the MRP process.
- Date Promised – Is the date we commit to give the order to the warehouse. If the MO is created manually the default date promised is the system date. If the MO wasgenerated by MRP this date is filled automatically using its algorithm calculation.
- **Approval Date** – Is the date on which the planned order should be approved to be released to the shop floor.
- **Delivered Date** – Is the Date on which the finished material of this order was received by the warehouse.
- Start Date Scheduled – Is the date, scheduled by MRP, when the MO should be released to the shop floor.
- Finish Date Scheduled Is the date, scheduled by MRP, when the MO should be received by the warehouse.

- Start Date – It is the date when the first manufacturing order movement is reported, this movement can be an inventory or labor movement.
- **Finish Date** - It is the date when the last manufacturing order movement is reported, It is the closing order date.
- **Before Float** – It will be used in future releases in order to balance the resource loading.
- **After Float** – It will be used in future releases in order to balance the resource loading.
- In the **Quantities** group of fields you can see the next fields:
    - The product Quantity to be fabricated and the Unit of Measure of this quantity.
    - The Qty Batchs is the number of batches you are going to do to fabricate all theproduct in the order.
    - The Qty. Batch Size is the quantity of product to be made in each batch.
- In the **Yield** field you can see the Product Yield defined as the the product quantity which fit the quality specifications divided by thetotal order quantity.
- **Delivered Quantity** is a read only field which contains the quantity delivered to the warehouse up to date.
- The Rejected Quantity is the quantity of product out of quality specifications reported to the manufacturing order. When Quality assurance take a decision around the rejected product, this product will have to be later reworked or sent to scrap. When you report Scrap Quantity, this will be added to the scrap quantity for the manufacturing order.
- Qty Scrap is the quantity of material out of specifications and of such characteristics that rework is impractical.
- Project and Campaign refer to the standard Compiere dimensions.
- The data contained in the Status group of fields have the normal use of Adempiere.
- The BOM & Formula used in the Manufacturing Order are taken from the Product Planning data window.
- BOM and Workflows used by the manufacturing orders are taken from the Product Data Planning.The information relative to every component that will be used in the manufacture of the finished product is taken from the Bill of Materials. This information is contained in the Order BOM/Formula tab.

The information relative to every component that will be used in the manufacture of the finished product is taken from the Bill of Materials. This information is contained in the Order BOM/Formula tab.

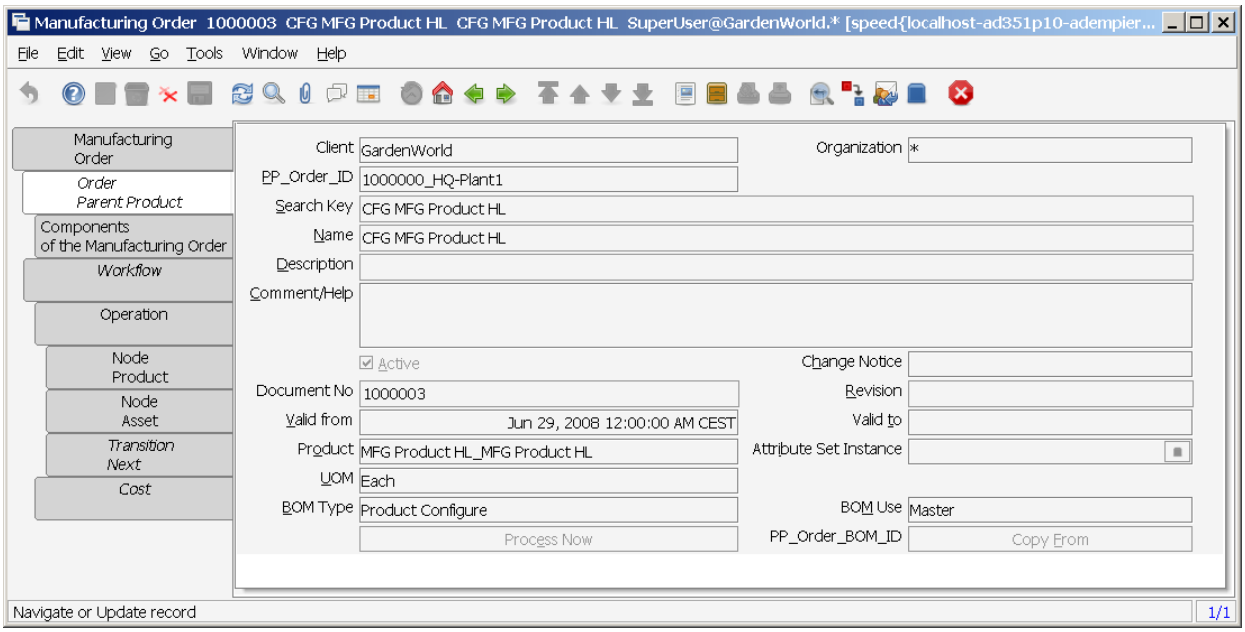
To get more information around the BOM heading data used in the MO you use the Order BOM/Formula tab. The data contained in this tab is explained in the section BOM/Formula in this Chapter.

The information around every component which will be used in the finished product fabrication are taken from the BOM lines.

You can find this information in the Order BOM/Formula Lines tab.

5.1.1.2 Tab: Order Parent Product

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Order Parent Product



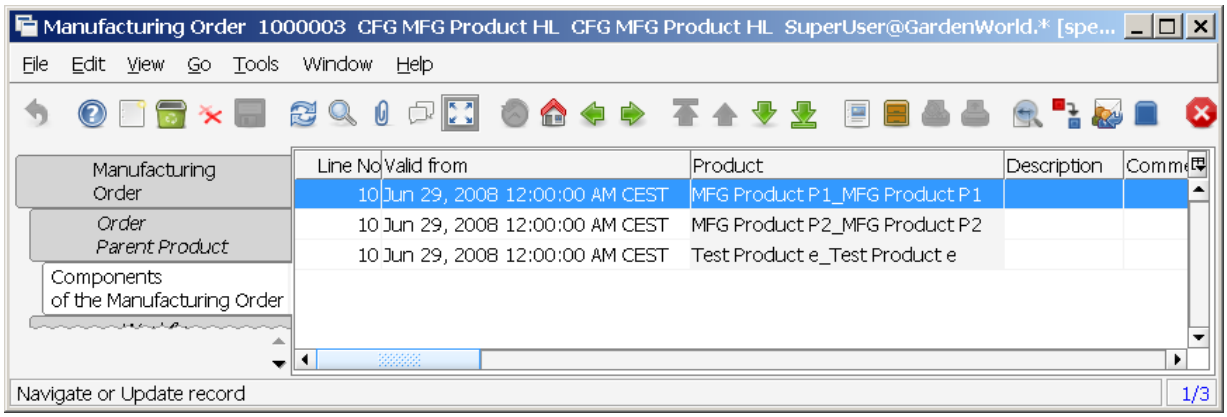
Questions to be answered:

- Are BOMUSE and BOMTYPE set correctly ?
- What is the meaning of PP_Order_BOM_ID and the Copy_From button ?

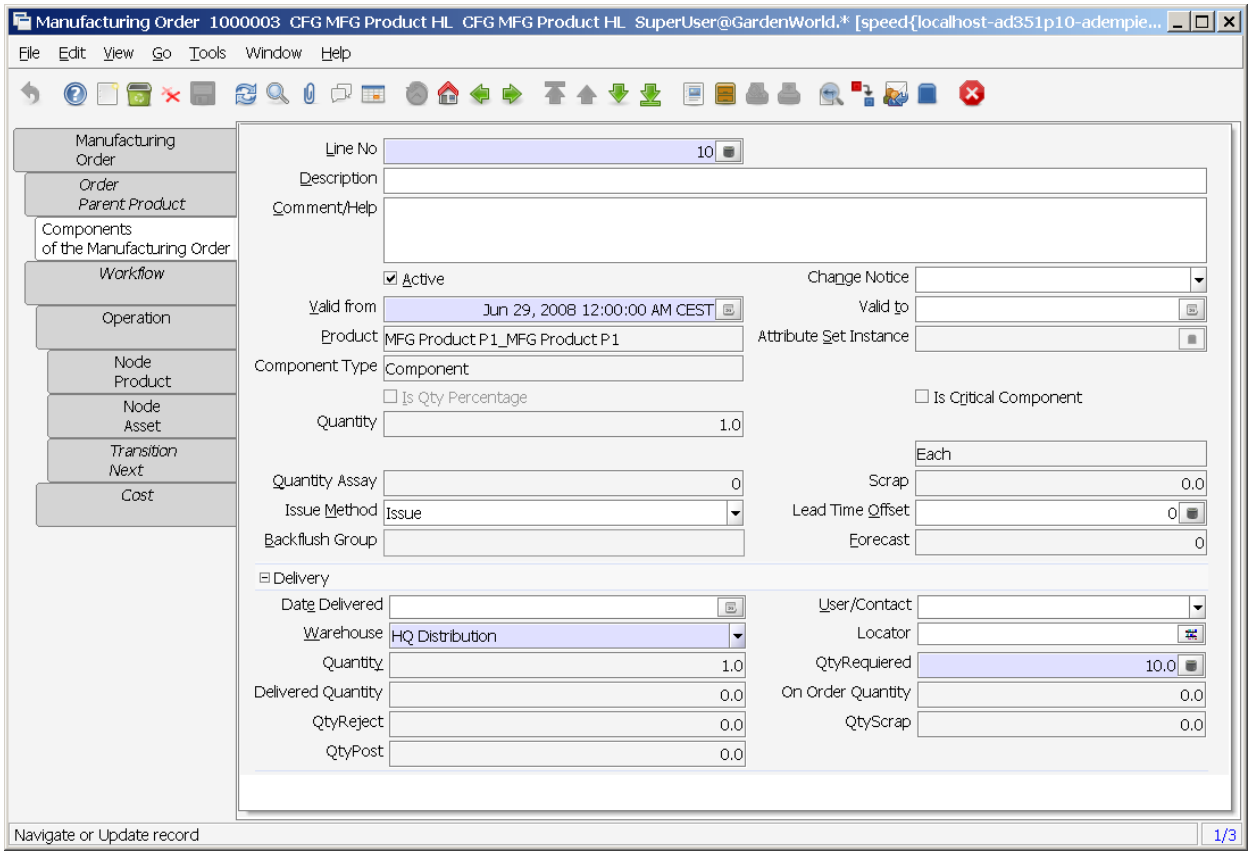
5.1.1.3 Tab: Components of the Manufacturing Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Components of The Manufacturing Order

Overview in grid display mode:



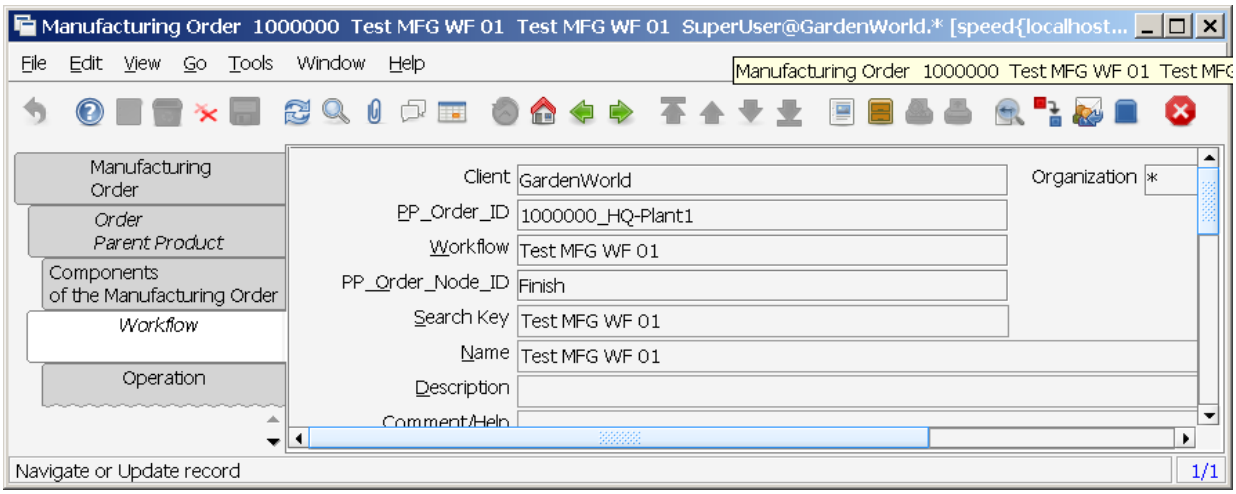
Display single record:



5.1.1.4 Tab: Workflow

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Workflow

Workflow is created during Engineering Management. This is just copied in. There are no updatable fields. So refer to the previous chapter (workflow ?).



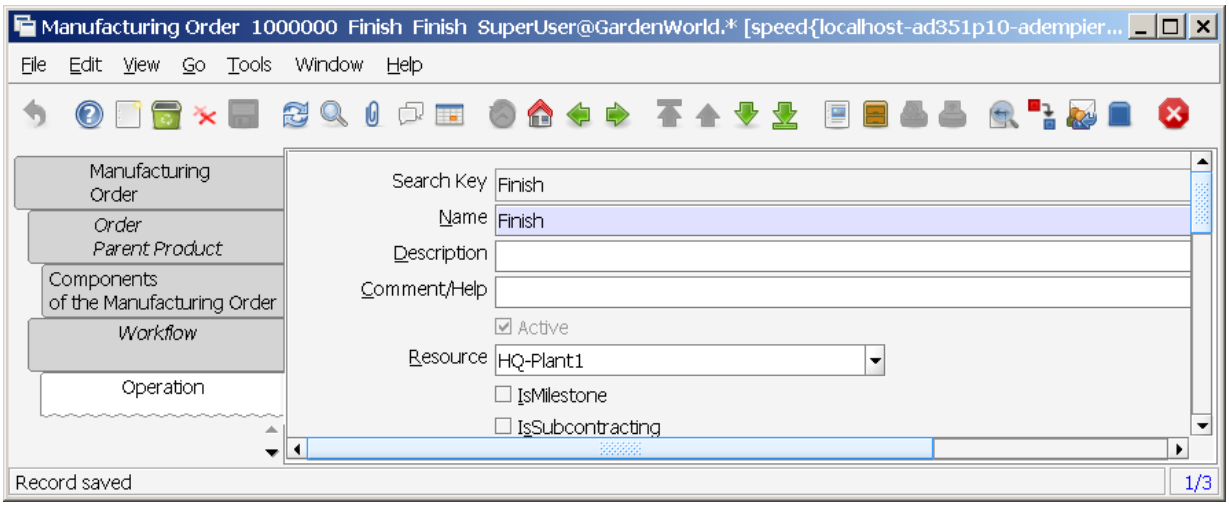
To get information about the Workflow heading which will be used in the Manufacturing Order, you must select the Workflow tab. Data contained in this tab are explained in the Manufacturing Workflow (Routes and Processes) section in this Manual.

5.1.1.5 Tab: Operation

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Operation

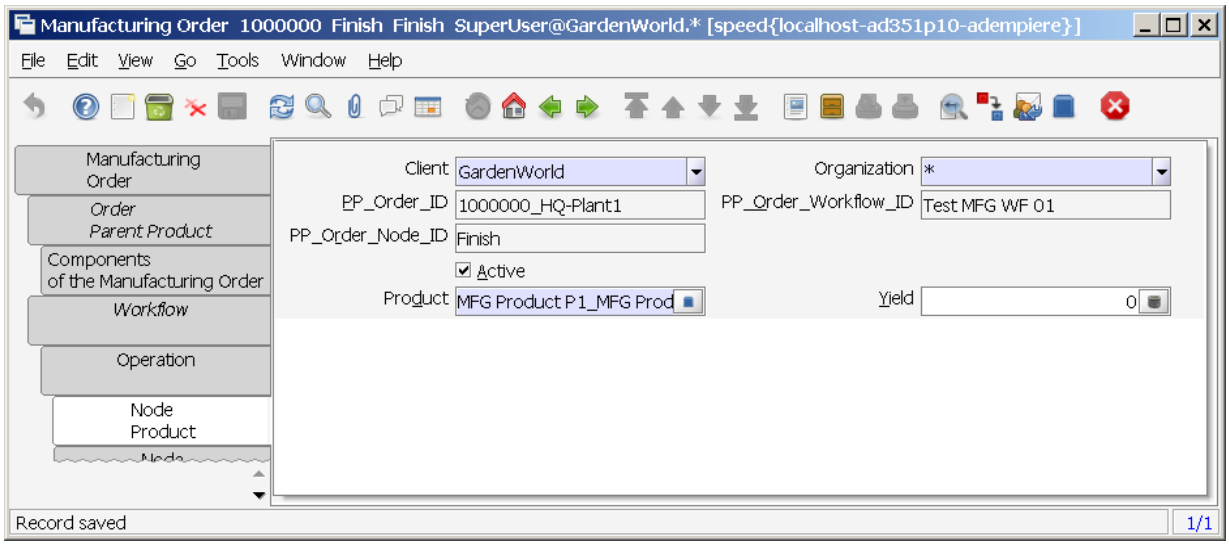
The relative information to each node (Or operations) will be used in the production of a product and will be taken from the nodes registered in the Manufacturing Workflow Windows in the Nodes tab. This data can be modified and also the data from the transition tab. To get detailed information around the fields please see the section Manufacturing Workflow in this Chapter.

Field Resource was empty – has to be set. Is this correct ?



5.1.1.6 Tab: Node Product

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Node Product

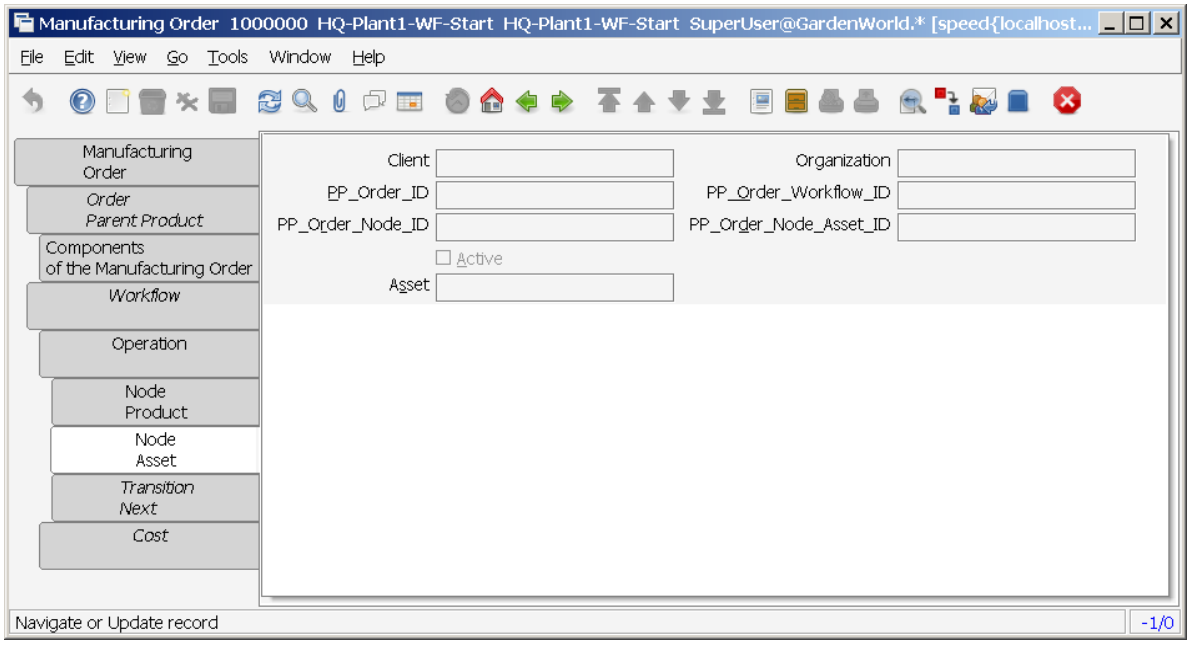


The field Product was not set. Is that correct ?

5.1.1.7 Tab: Node Asset

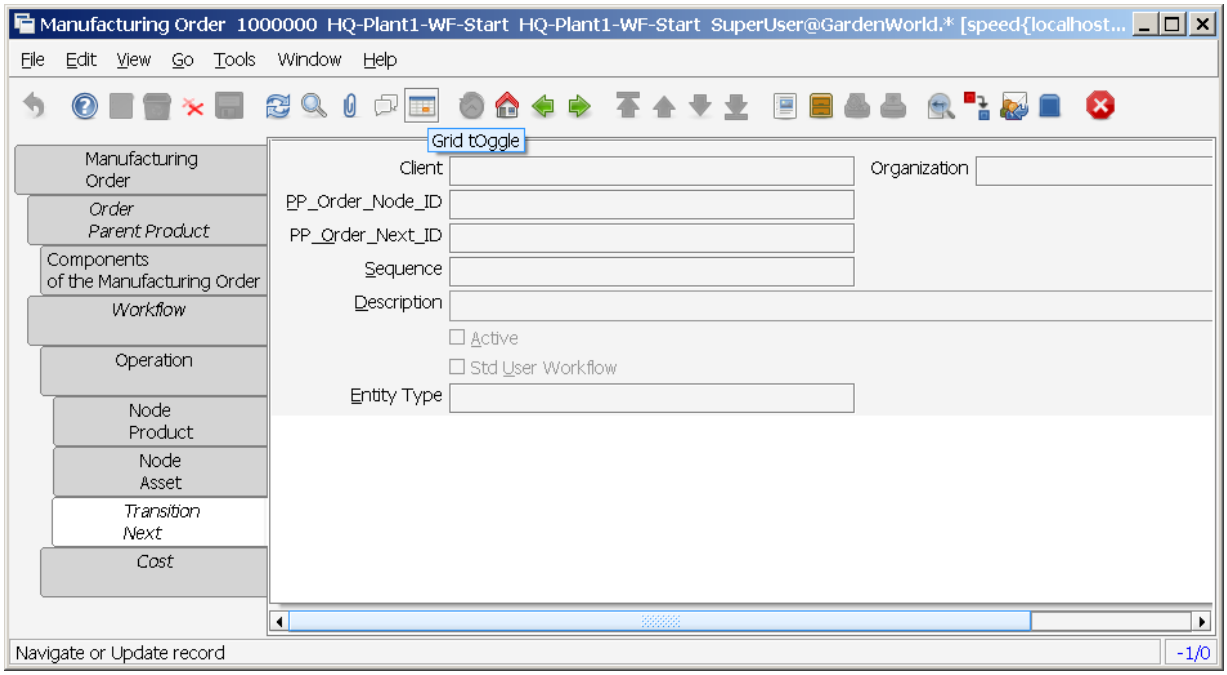
Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Node Asset

Not used right now. Displayed, just to show the fields.



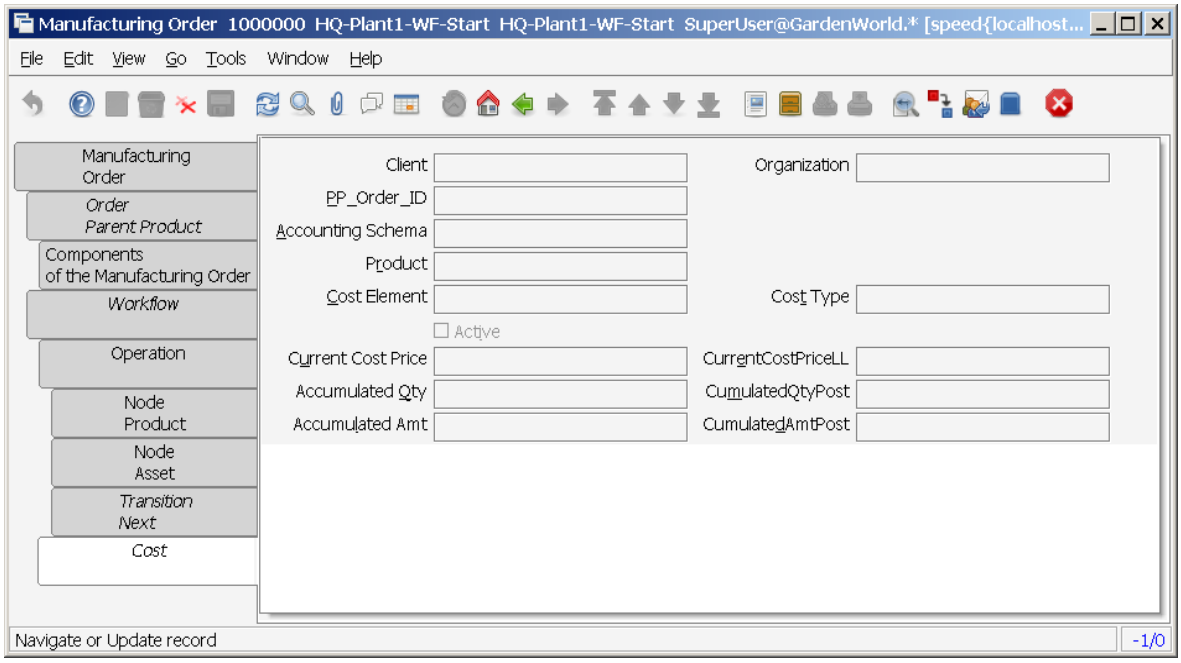
5.1.1.8 Tab: Transition Next

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Transition Next



5.1.1.9 Tab: Cost

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Order --> Tab: Cost



In the Cost Tab we have a record for each Cost Element defined in the Product to be produced, for these Organization, Warehouse, Cost Group and Resource.

You can see the standard amounts for each Cost Element at this level and for each Cost Element at lower level for the product. The cost at this level refers to the Cost Elements of the product to be produced (just at the level of the finished product). Cost elements at lower levels refers to the cost of the the product to be produced (including the cost of the Cost Elements of every component).

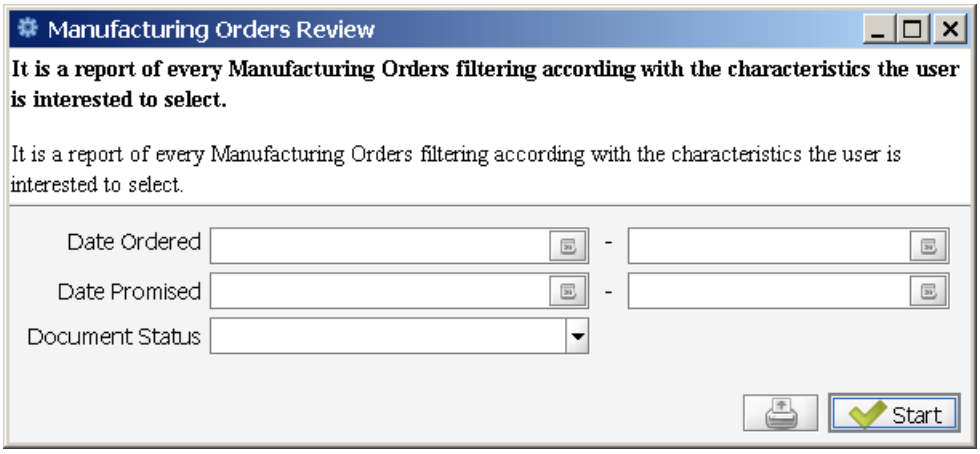
The last four fields are related to the accumulated quantities and amounts for product movements and posted movements. These fields are for each cost element:

- Cum Qty Cost Element: This field shows the sum of the quantities of the product that have had movements.
- Cost Element Cum Qty Post: This field shows the sum of the quantities of the product that have had movements and have been posted to the GL for the cost elements.
- Cum Amt Cost Element: This field shows the sum of the amounts of the product that have had movements.
- Cum Amt Cost Element Post: This field shows the sum of the amounts of the product that have had movements and have been posted to the GL.

5.1.2 Manufacturing Orders Review

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Manufacturing Orders Review

It is a report of every Manufacturing Orders filtering according with the characteristics the user is interested to select.



ADempiere — Manufacturing Orders Review — Copiar registro 4082309 &Copy — Page 1(1,1) of 7(1,7)

Document No	Line No	Target Doc Type	Description	Product	Attribute Set Instance	Resource	Workflow
1000000	0	Manufacturing Order		TestProduct - TestProduct		HQ-Plant1	HQ-WF01

ADempiere — Manufacturing Orders Review — Copiar registro 4082309 &Copy — Page 2(1,2) of 7(1,7)

Document No	Warehouse	BOM & Formula	Planner	Priority	Date Ordered
1000000	HQ Warehouse	PP_HL - PP_HL - 1000001		Medium	Jun 25, 2008 12:00:00 AM CEST

ADempiere — Manufacturing Orders Review — Copiar registro 4082309 &Copy — Page 3(1,3) of 7(1,7)

Document No	Date Promised	DateConfirm	Date Delivered	DateStartSchedule	DateFinishSchedule
1000000	Jun 25, 2008 6:31:00 AM CEST			Jun 25, 2008 12:00:00 AM CEST	

ADempiere — Manufacturing Orders Review — Copiar registro 4082309 &Copy — Page 4(1,4) of 7(1,7)

Document No	DateStart	Finish Date	FloatBefored	FloatAfter	Quantity	UOM	QtyBatchs	QtyBatchSize	Ordered Qty
1000000			0	0	1	Each	0	0	1

ADempiere — Manufacturing Orders Review — Copiar registro 4082309 &Copy — Page 5(1,5) of 7(1,7)

Document No	Delivered Qty	Yield	QtyReject	QtyScrap	Project	Campaign	Activity	Trx Organization	User 1	User 2	Doc Status
1000000	0	100	0	0							Drafted

ADempiere — Manufacturing Orders Review — Copiar registro 4082309 &Copy — Page 6(1,6) of 7(1,7)

Document No	Doc Type	Approved	Printed	Selected	Processed	Quantity Assay	Is Qty Percentage	Lot No	OrderType
1000000	** New **	✗	✗	✗	✗	0	✗		

ADempiere — Manufacturing Orders Review — Copiar registro 4082309 &Copy — Page 7(1,7) of 7(1,7)

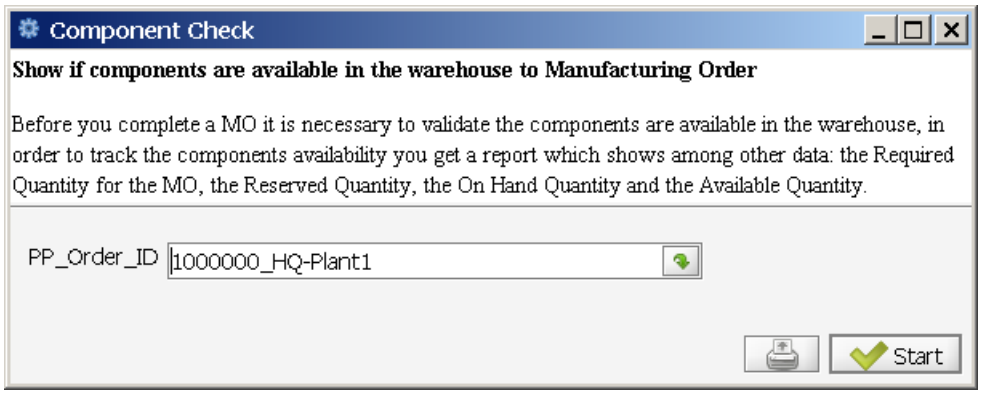
Document No	Sales Transaction	Schedule Type	Serial No
1000000	✗	D	

5.1.3 Component Check

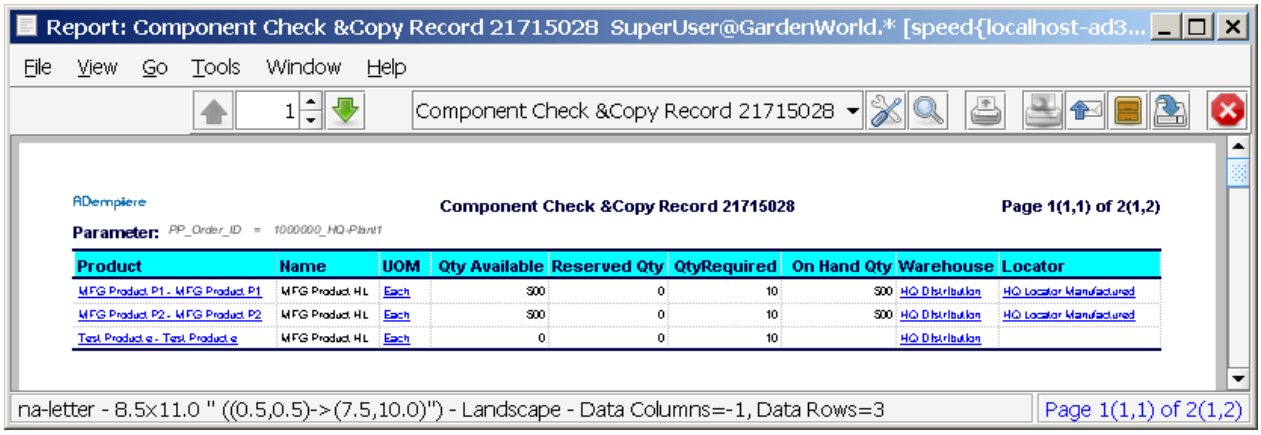
Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Component Check

Before you complete a MO it is necessary to validate the components are available in the warehouse, in order to track the components availability you get a report which shows among

other data: the Required Quantity for the MO, the Reserved Quantity, the On Hand Quantity and the Available Quantity.

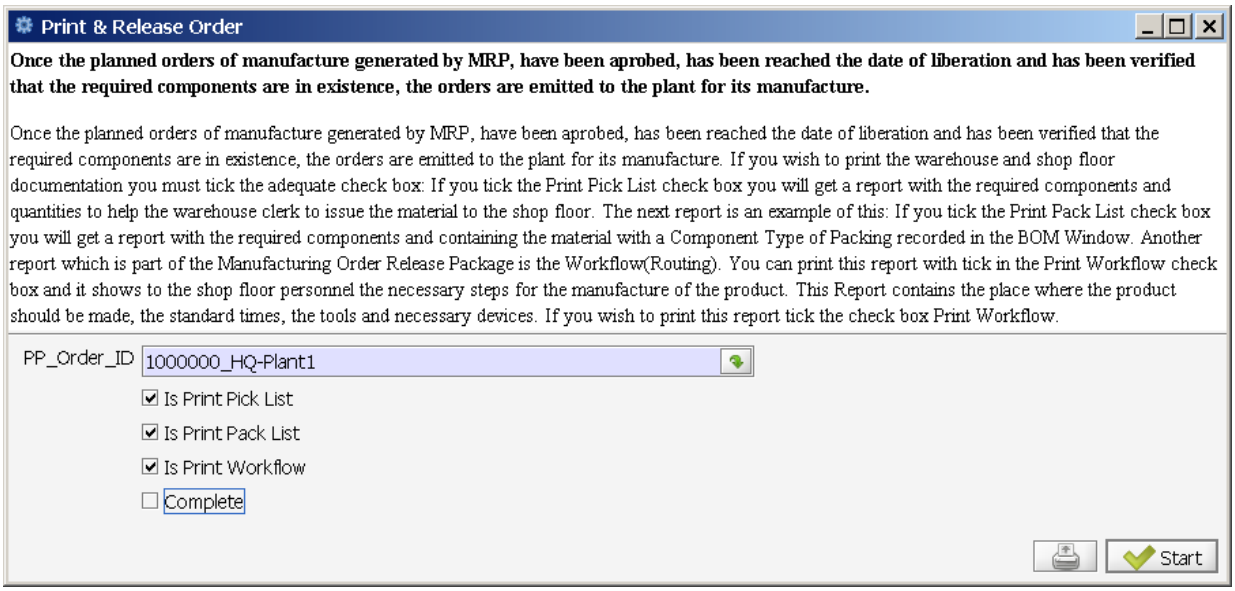


Click OK (Start) will create the following report.

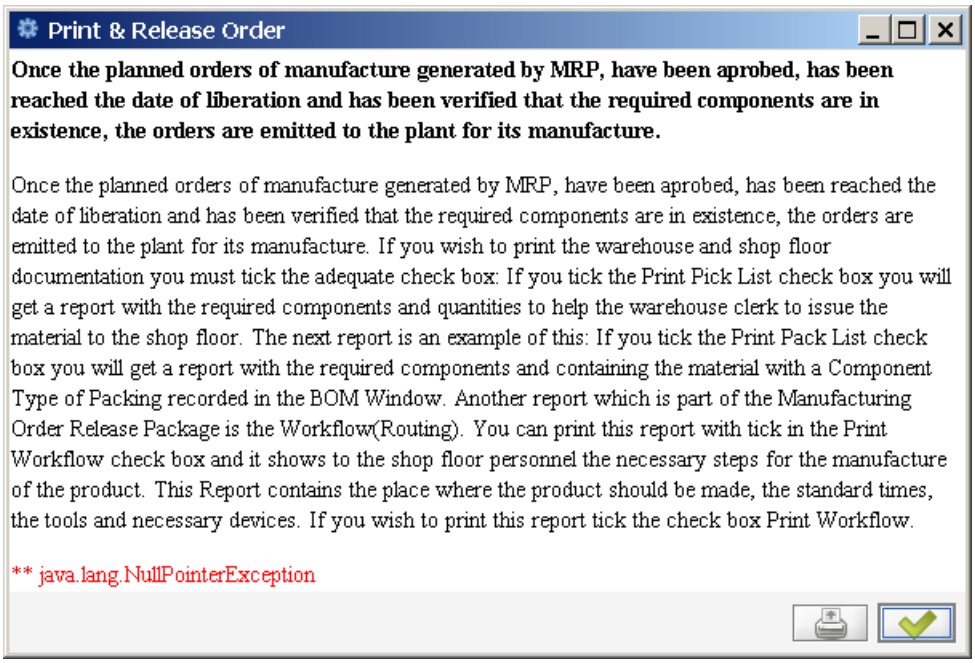


5.1.4 Print & Release Order

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Print & Order Release



Actual result:



Once the planned orders of manufacture generated by MRP, have been aprobed, has been reached the date of liberation and has been verified that the required components are in existence, the orders are emitted to the plant for its manufacture.

If you wish to print the warehouse and shop floor documentation you must tick the adequate check box:

If you tick the Print Pick List check box you will get a report with the required components and quantities to help the warehouse clerk to issue the material to the shop floor. The next report is an example of this: OPEN

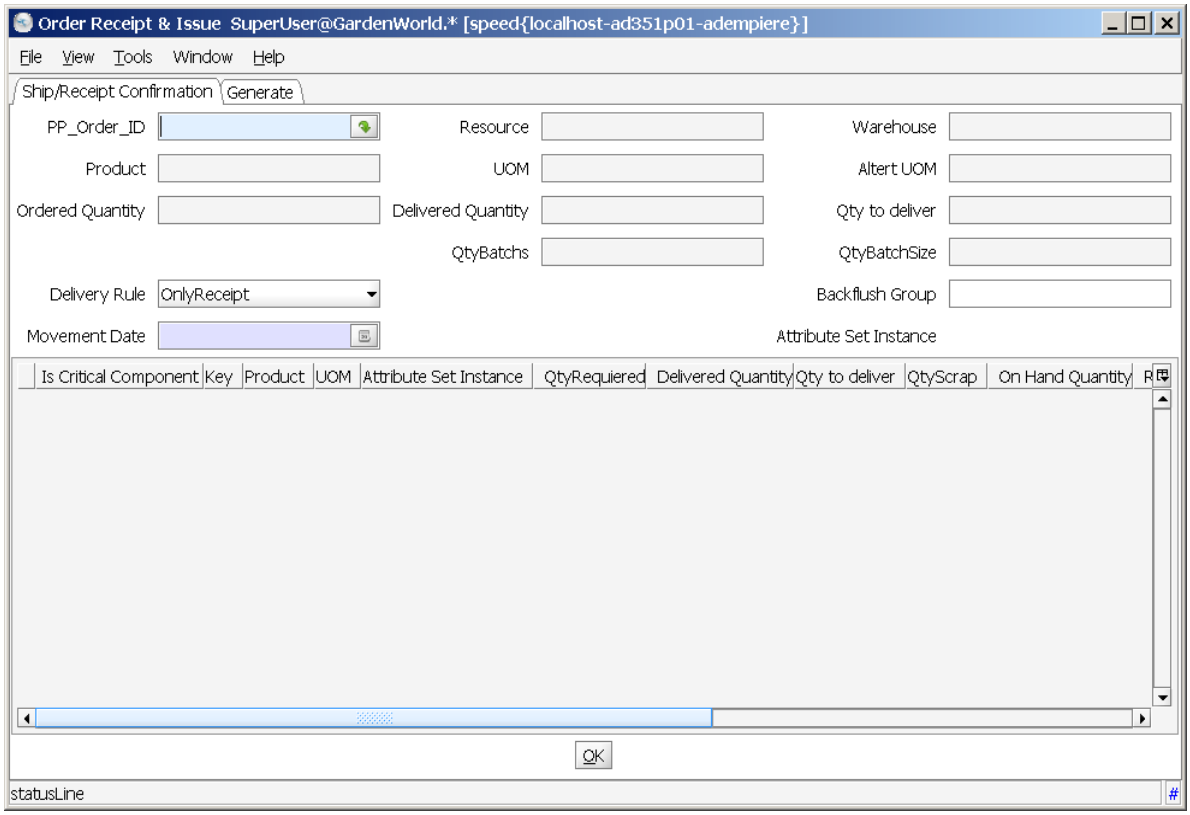
If you tick the Print Pack List check box you will get a report with the required components and containing the material with a Component Type of Packing recorded in the BOM Window.

Another report which is part of the Manufacturing Order Release Package is the Workflow (Routing). You can print this report with tick in the Print Workflow check box and it shows to the shop floor personnel the necessary steps for the manufacture of the product. This Report contains the place where the product should be made, the standard times, the tools and necessary devices. If you wish to print this report tick the check box Print Workflow.

5.1.5 Order Receipt & Issue

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Order Receipt & Issue

The last step in the fabrication process with a Manufacturing Order is to receipt the finished product in the warehouse. This last step is accomplished here.



The window shows at the upper side static information around the product and the manufacturing resource where it has to be made, it also shows a summary of the quantities to be controlled in the MO such as the Original and delivered quantities and the Quantity to deliver for the MO up to date.

If the production process requires production in batch, then the Qty Batchs shows the Number of batches the shop floor needs to do and the Qty Batch Size contains the size of every batch to be produced.

If you want to issue the MO components before you receive the finished product you should tick the checkbox Is Delivery, this case is recommended when you have a long to medium lead time and you want to have the inventory quantities as reliable as possible at every moment.

If you have small lead time and you wish to save clerk time then you must tick Is Backflush checkbox and you will receive the finished product at the same time you issue automatically the components

The Backflush Group field is used when you want to issue just components belonging to this group. (This characteristic could not be included in the current version).

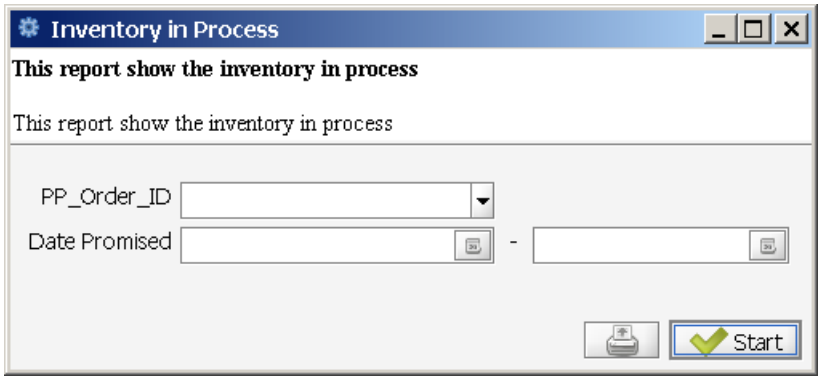
At the lower part of the window you can find the list of every MO component, this can be modified according with the real products and quantities given to the shop floor.

The quantities to be issued are selected with the checkbox at the first column of the list of components. If the actual quantity is different from the standard quantity showed in the column Qty to deliver you should edit this field to enter the right quantity to be issued.

Finally a message box asks if you want to close the OM document, you should click the ok button if this MO will not have any more transactions and must be closed.

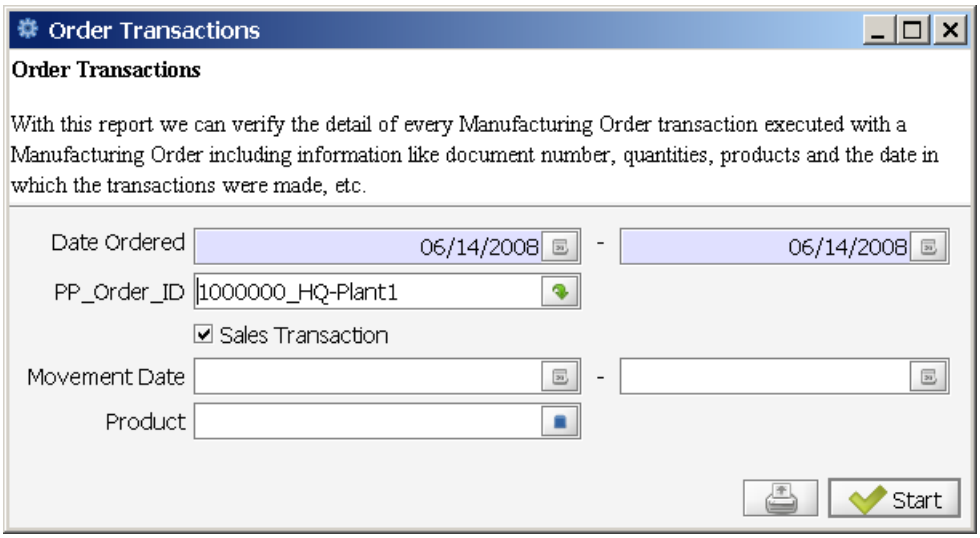
5.1.6 Inventory in Process

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Inventory in Process

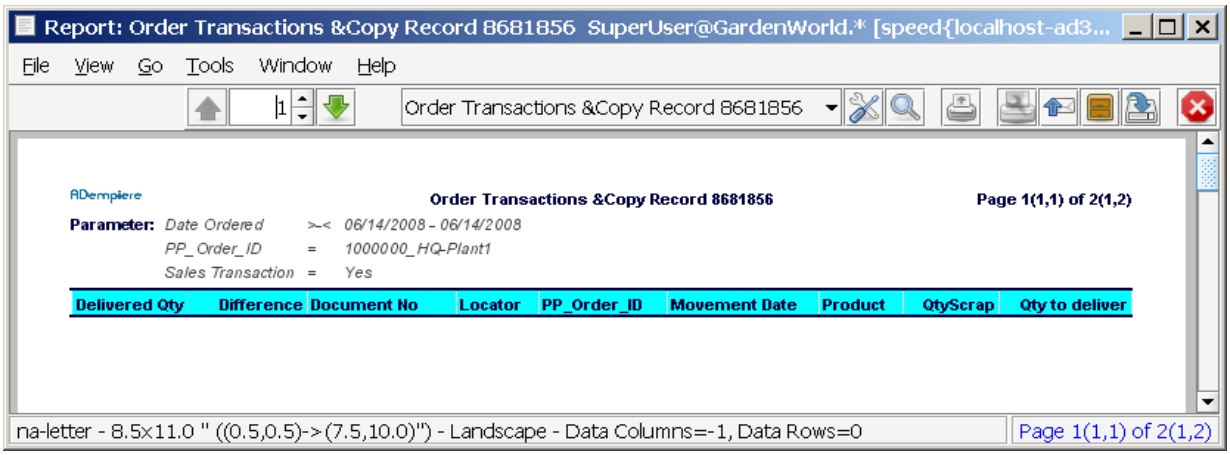


5.1.7 Order Transactions

Menu: Manufacturing Management < Production Management < Discrete Manufacturing < Order Transactions



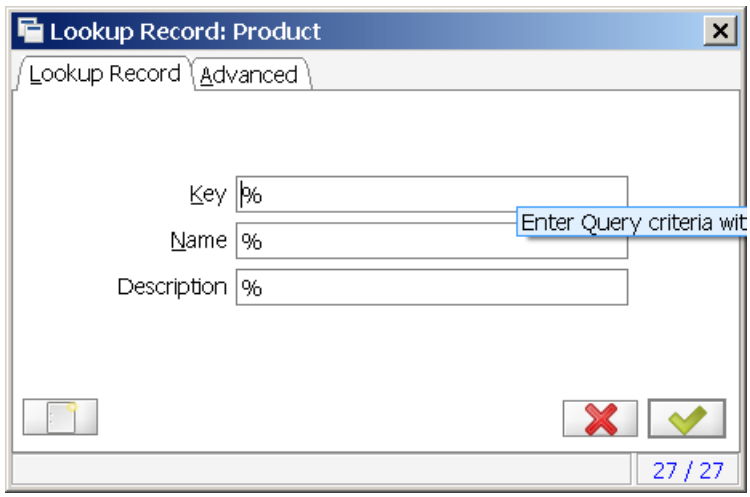
With this report we can verify the detail of every Manufacturing Order transaction executed with a Manufacturing Order including information like document number, quantities, products and the date in which the transactions were made, etc.



5.1.8 Management Maintenance

Menu: Manufacturing Management < Production Management < Management Maintenance

What are the Spare Parts for ?

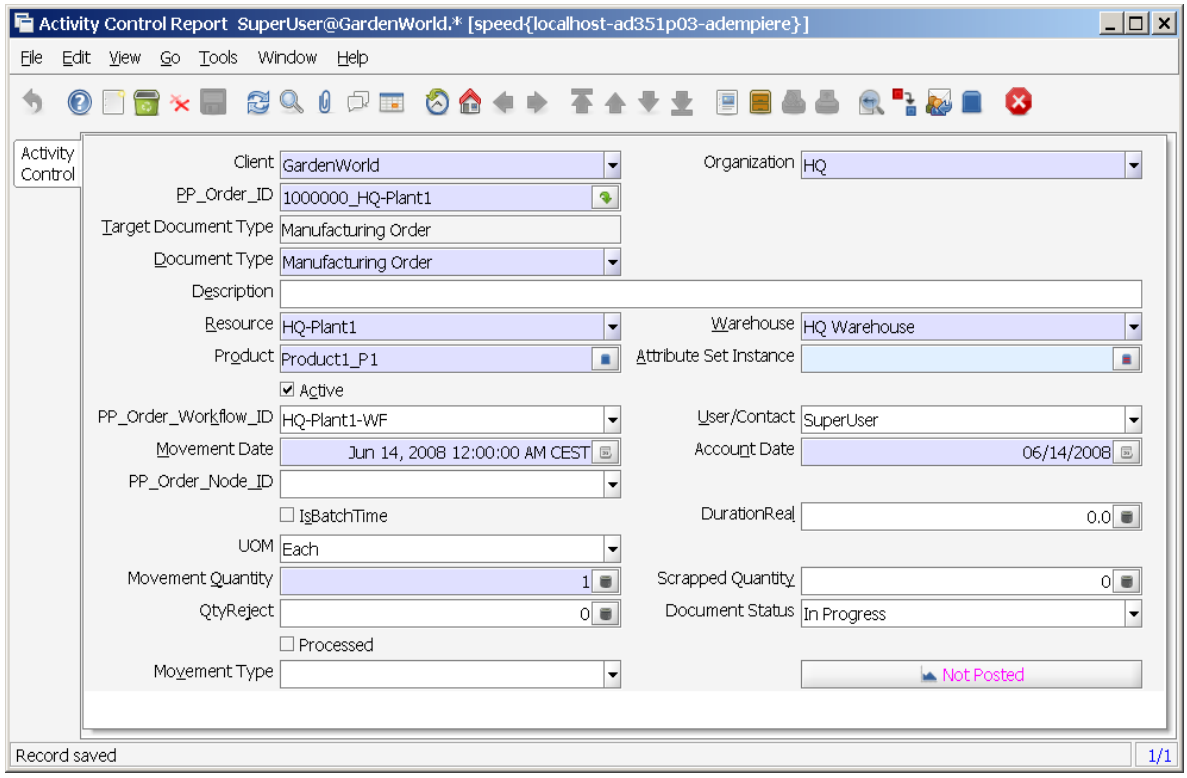


5.2 Shop Floor Control

Menu: Manufacturing Management < Production Management < Shop Floor Control

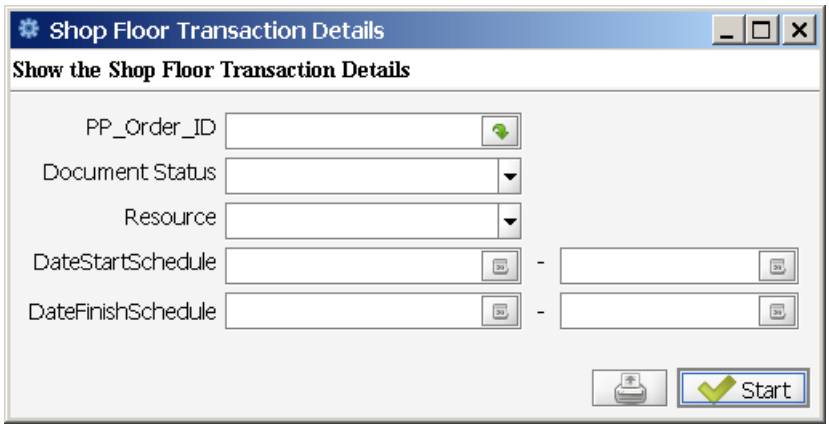
5.2.1 Activity Control Report

Menu: Manufacturing Management < Production Management < Shop Floor Control < Activity Control Report



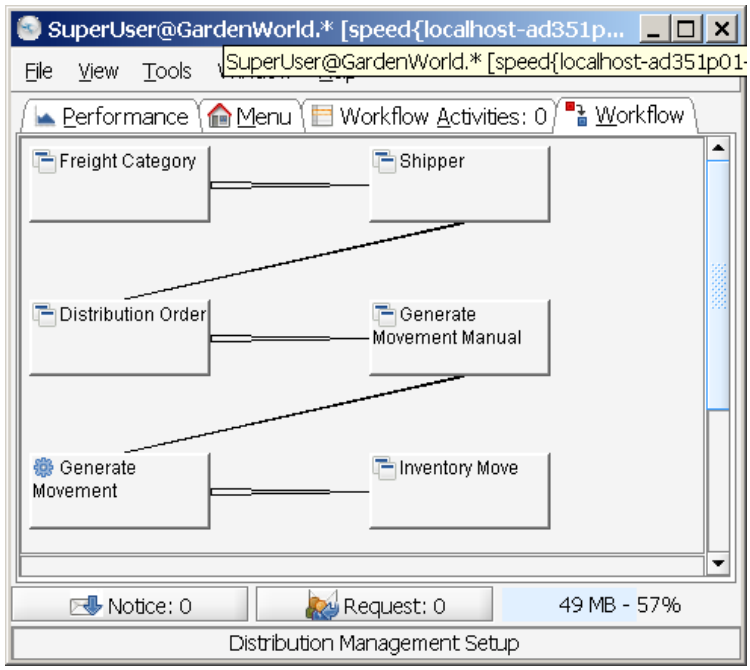
5.2.2 Shop Floor Transaction Details

Menu: Manufacturing Management < Production Management < Shop Floor Control < Shop Floor Transaction Details

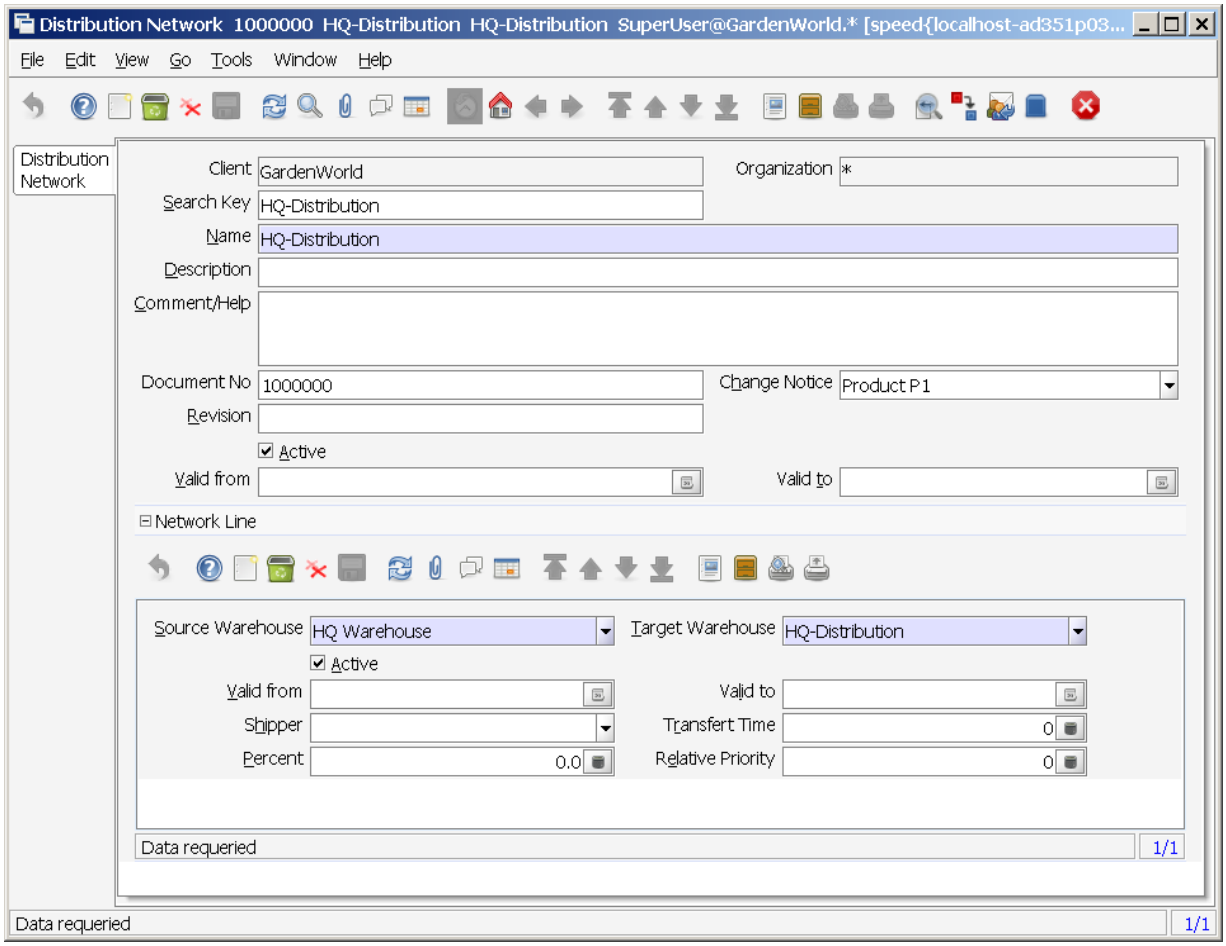


6 Distribution Management

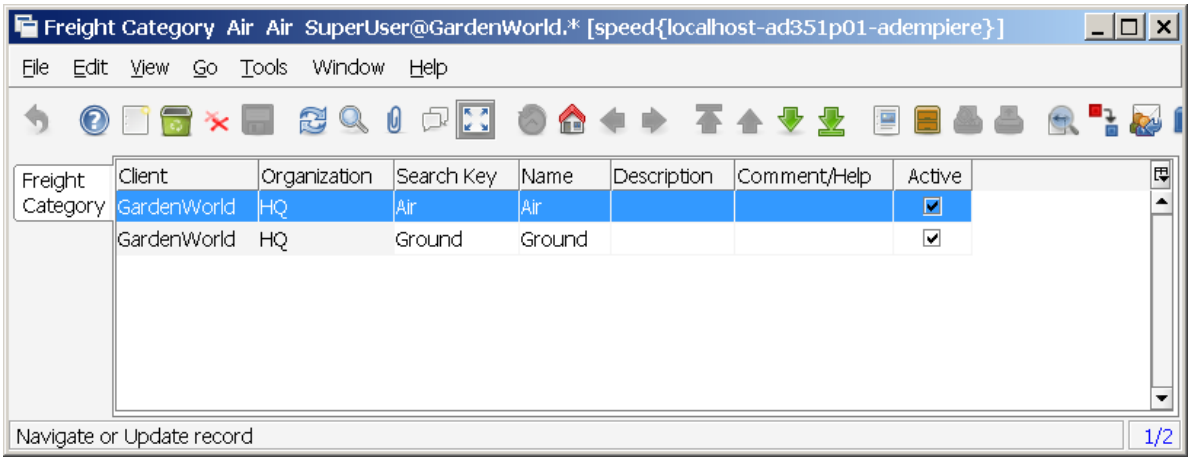
6.1 Distribution Management Setup



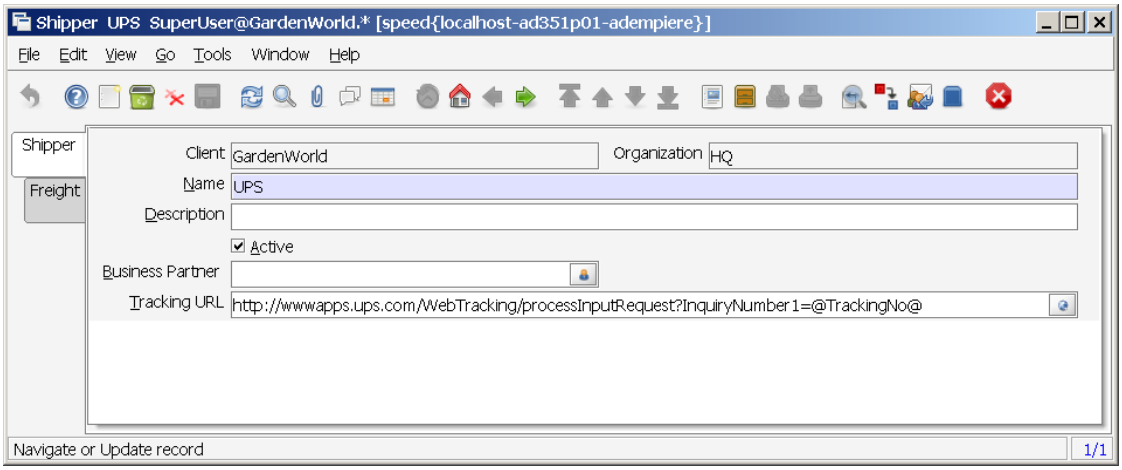
6.2 Distribution Network

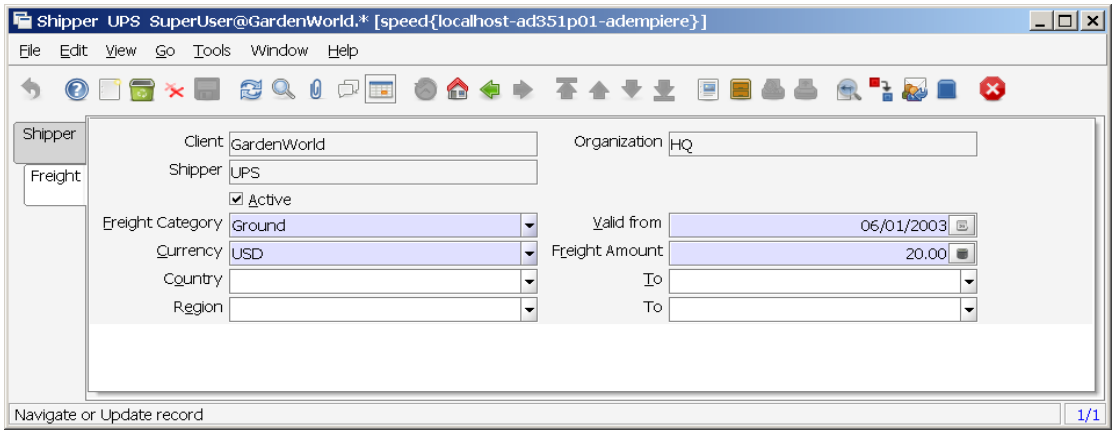


6.3 Freight Category

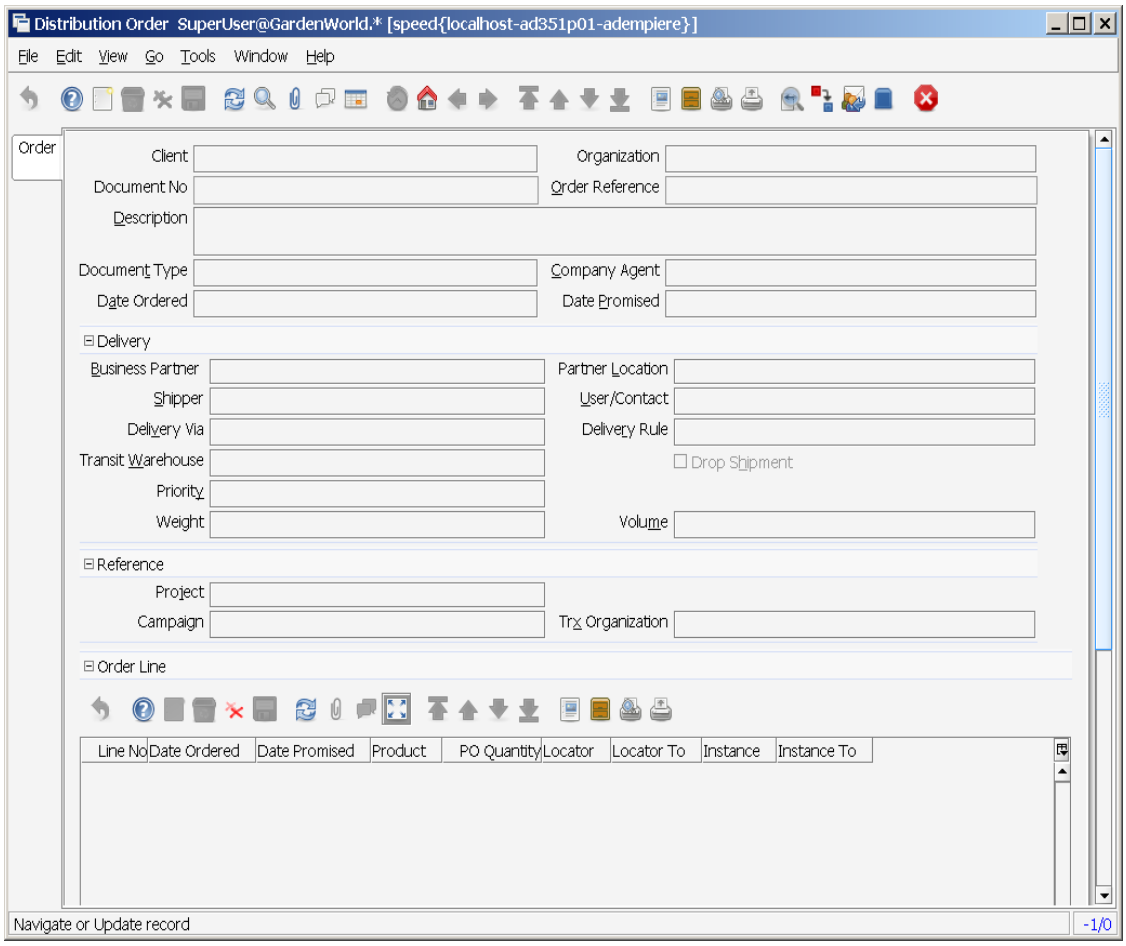


6.4 Shipper

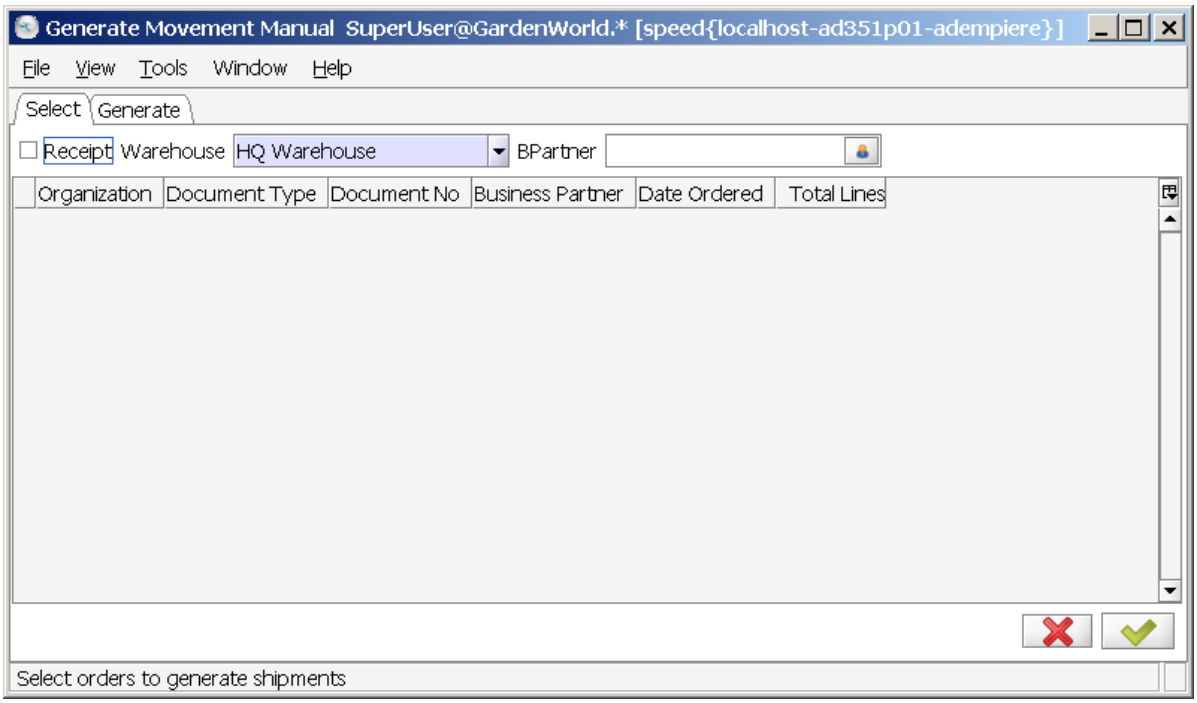




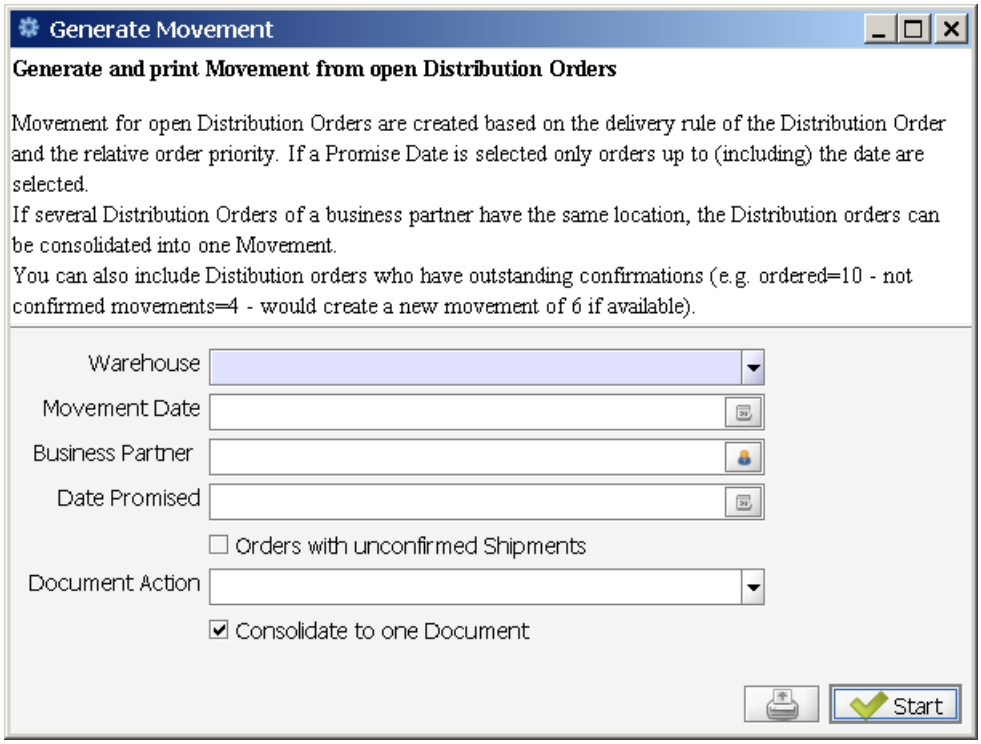
6.5 Distribution Order



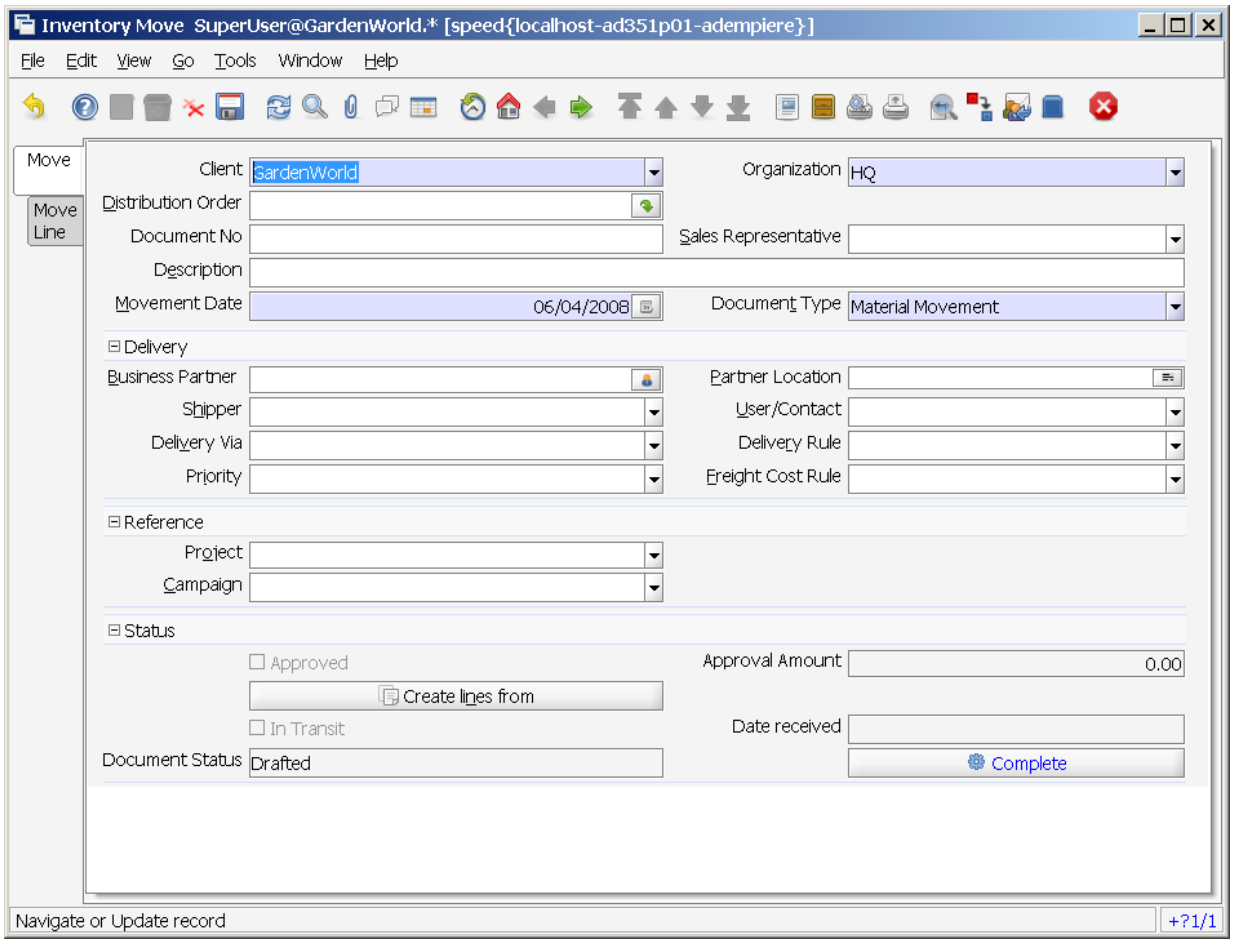
6.6 Generate Movement - Manual

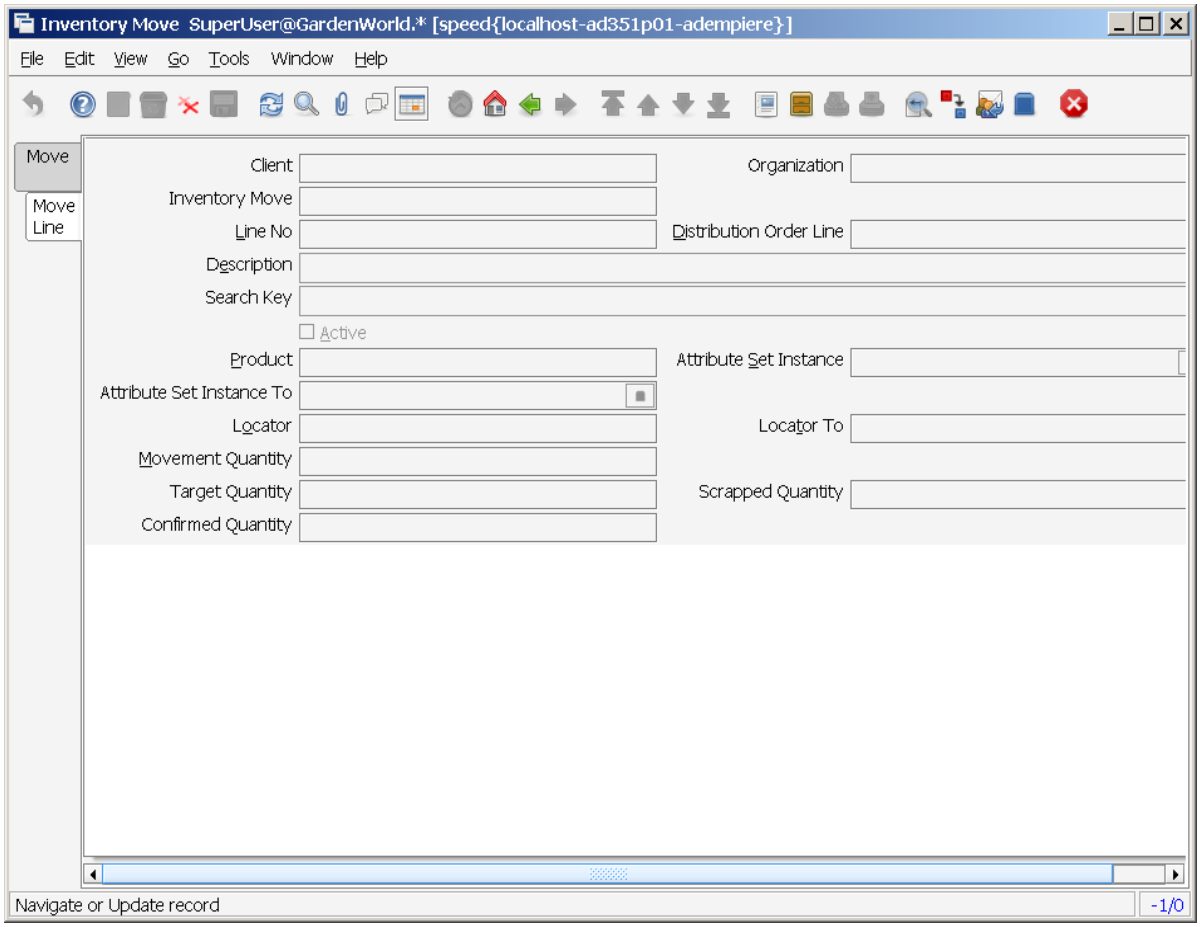


6.7 Generate Movement - Process



6.8 Inventory Move




Inventory Move SuperUser@GardenWorld.* [speed{localhost-ad351p01-adempiere}]
File Edit View Go Tools Window Help
Move
Move Line
Client
Organization
Inventory Move
Line No
Distribution Order Line
Description
Search Key
Active
Product
Attribute Set Instance
Attribute Set Instance To
Locator
Locator To
Movement Quantity
Target Quantity
Scrapped Quantity
Confirmed Quantity
Navigate or Update record
-1/0

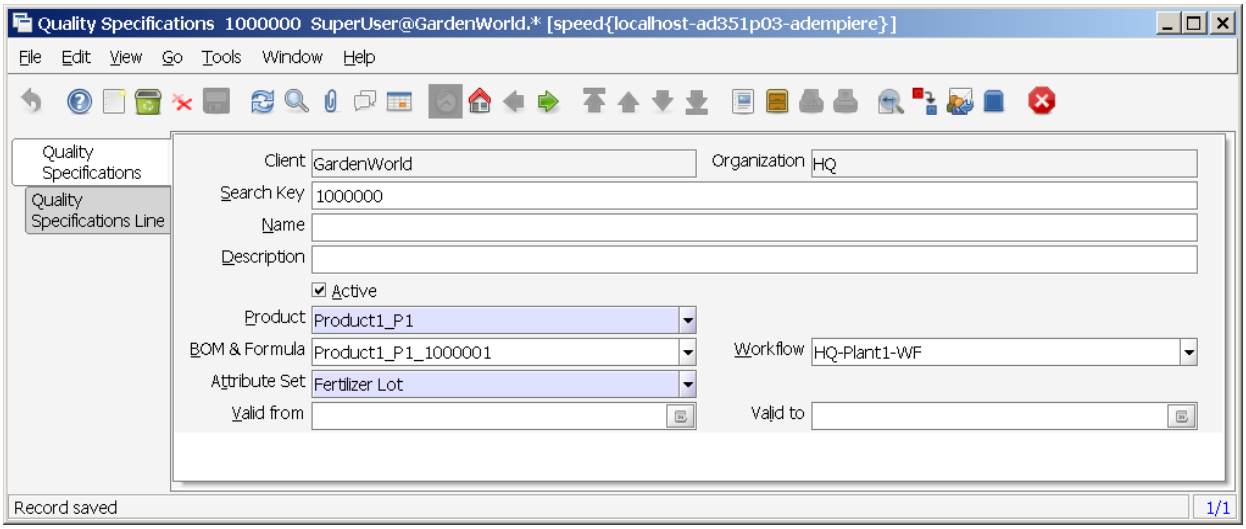
7 Quality Management

7.1 Window: Quality Specifications

Menu: Manufacturing Management < Quality Management < Quality Specifications

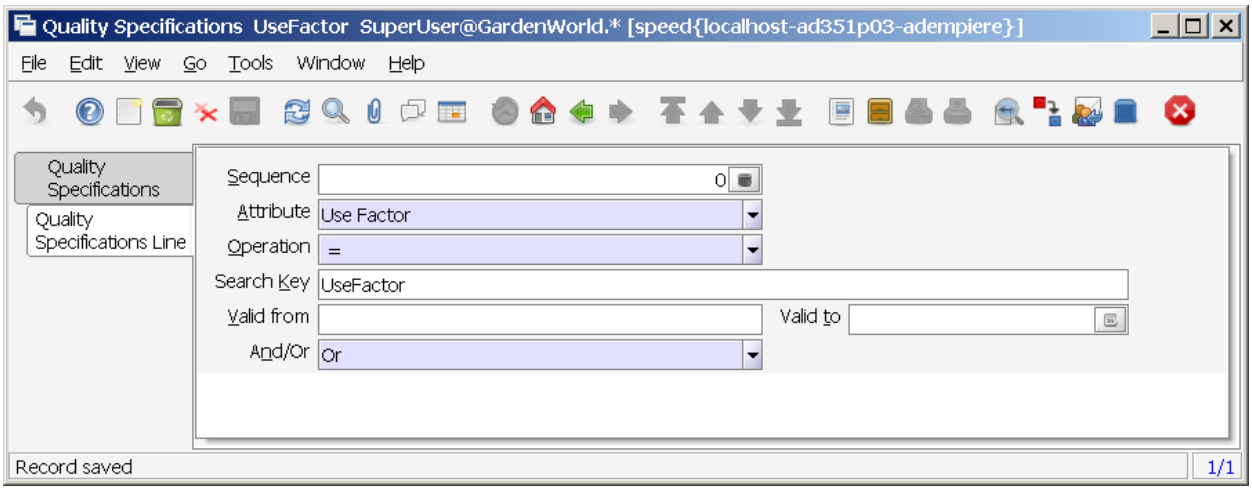
7.1.1 Tab: Quality Specifications

Menu: Manufacturing Management < Quality Management < Quality Specifications



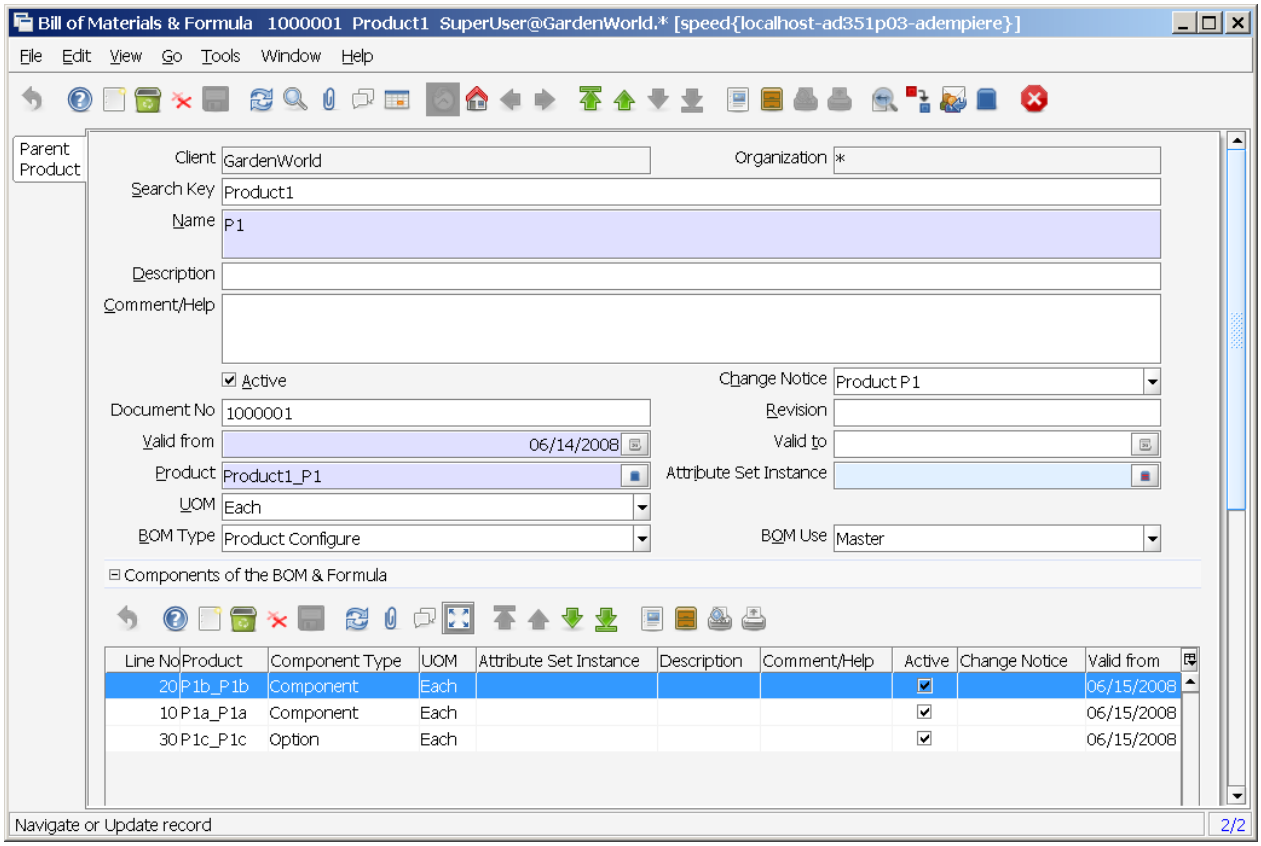
7.1.2 Tab: Quality Specifications Line

Menu: Manufacturing Management < Quality Management < Quality Specifications



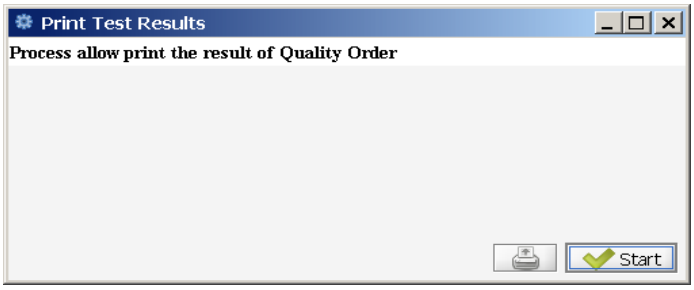
7.2 Bill of Materials & Formula

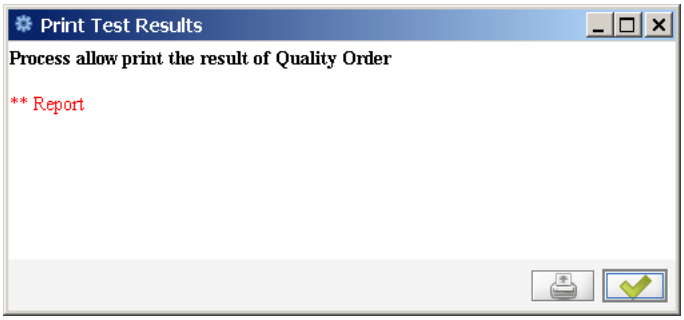
Menu: Manufacturing Management < Quality Management < Bill of Materials & Formula



7.3 Print Test Results

Menu: Manufacturing Management < Quality Management < Print Test Results





8 Standard Costing Management

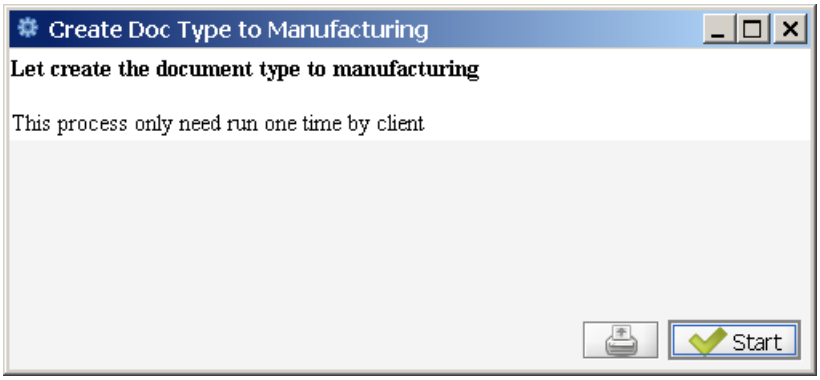
The Cost Management system is used to segregate the most important problems from those which are less important using the production cost criteria. . With Cost Management we know the actual cost of the cost elements grouped into cost types: material, labor, burden, overhead, subcontracts and distribution for every product used in production. Knowing costs and its variances: current vs standard, you will be able to take the correcting actions at the right time.

The Cost group allows you to define as many as you wish, different costs for the same product at an organization. For Instance, you can set one or more Cost Groups to do an analysis of "What if" in case of possible cost changes because of the economic company environment. On the other hand you need to define one Cost Group to be used in the accounting transactions.

With this module you mainly answer the question: are every cost element used in the Manufacturing Orders inside the production plan?

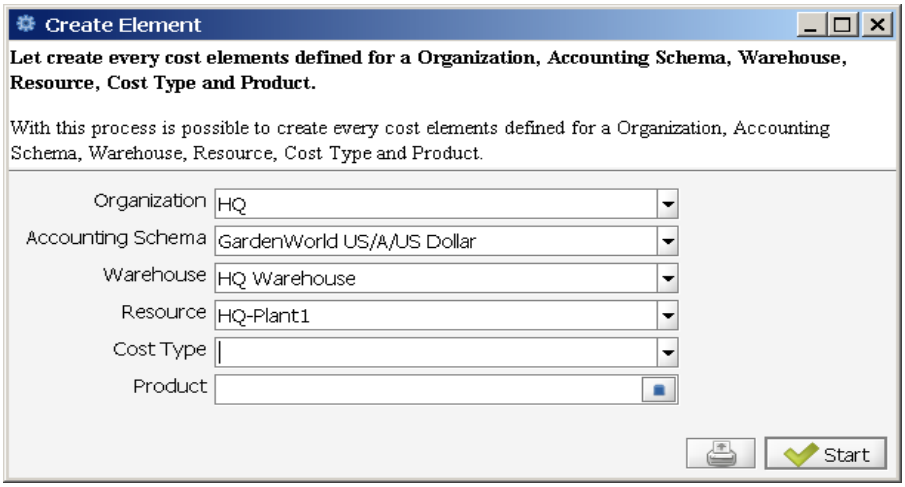
8.1 Create Doc Type to Manufacturing

Menu: Manufacturing Management < Standard Costing Management < Create Doc Type to Manufacturing



8.2 Create Element

Menu: Manufacturing Management < Standard Costing Management < Create Element



A Cost Element is a cost component that can be controlled in a separate way and it is part of the groups defined as Cost Type. The Cost Type can be: Material, Labor, Overhead, Burden, Distribution and Subcontract. For instance: the Cost type Material can be segregated in one Cost Element named Freight and another Cost Element named material.

The Cost Element can be controlled in different accounting elements in the Tab Account Cost Elements CMPCS.

You must enter the next Accounts:

COGS CMPCS : The account to register the costs associated with producing a product. This cost account is used when you make a customer shipment.

Absorption Cost CMPCS: The account to register the cost proportion of the productive cost,it is refereed to labor and burden cost.

Use variance: Is used to register the cost variance due to a difference between the real quantity used in the transaction and the standard quantity.

Rate variance: Is used to register the cost variance due to a difference between the real rate used in the transaction and the standard rate.

Method variance: Is used to register cost variances because of substitution of routing operation or substitution of components in the BOM. When the MO is closed any amount remaining in WIP will be taken to this variance.

To enter the cost elements for every set of Organization, Accounting Schema, Warehouse, Resource, Cost Group and product select the menu option: Cost Management<Cost Element:

The Product Tab shows the basic information about a product. It is the same information that is registered in the Product Tab from the Product option menu.
The Product Cost Tab allows you to enter the cost in the field This Level amount for Cost Element CMPCS, which is the cost product at the level of the product and this cost element is given for an Organization, Accounting Schema, Warehouse, Resource and Cost Group.

In the same tab you can see the Lower Level Amounts for Cost Element CMPCS. Here you can see the result of adding the cost element amounts for the given product in every BOM lower levels.

The file Cum Qty Cost Element CMPCS shows the addition of the product quantities that have been issued to Manufacturing Orders with the same conditions of the windows elements.

The field Cumulative Amount of Cost Element shows the addition of all the product cost amounts which has been issued to MO with the same conditions of the cost elements of the window.

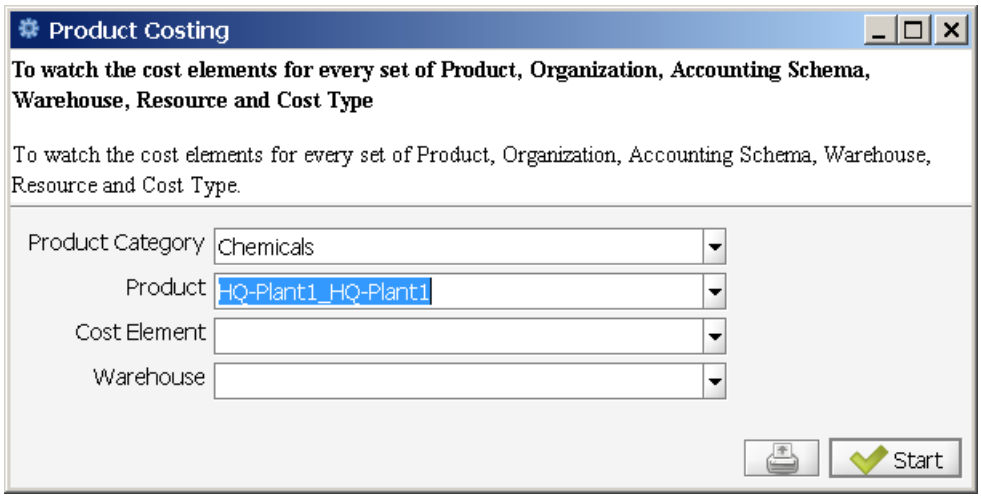
To watch the cost elements for every set of Product, Organization, Accounting Schema, Warehouse, Resource and Cost Group select the menu option: Cost Management < Product Cost Report.

The next form will be displayed:

Click the OK button and you will get a report showing for the products filtered the Cost Element, Cost Group, Cost Amounts at this and lower levels and Product Category.

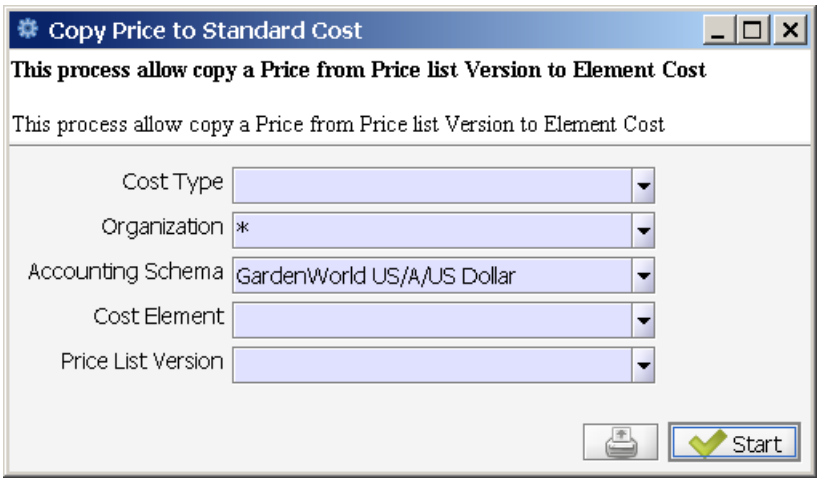
8.3 Product Costing

Menu: Manufacturing Management < Standard Costing Management < Product Costing



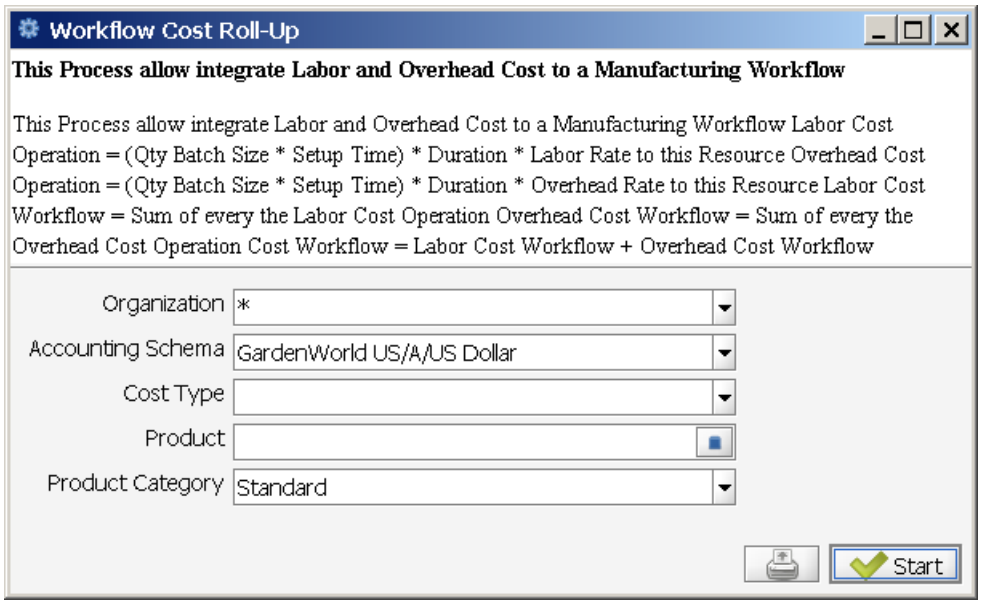
8.4 Copy Price to Standard Cost

Menu: Manufacturing Management < Standard Costing Management < Copy Price to Standard Cost



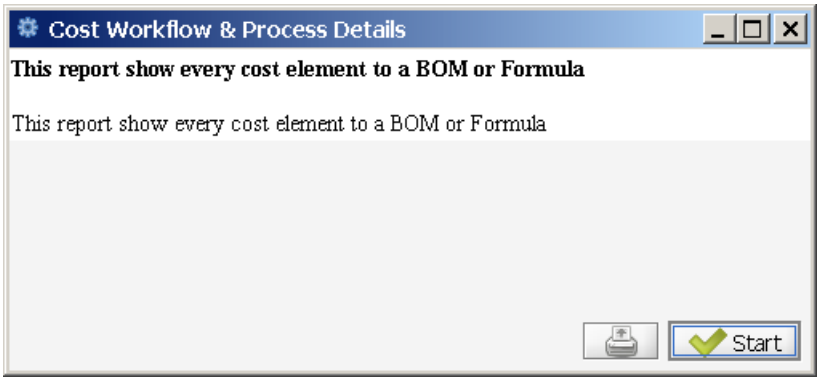
8.5 Workflow Cost Roll-Up

Menu: Manufacturing Management < Standard Costing Management < Workflow Cost Roll-Up



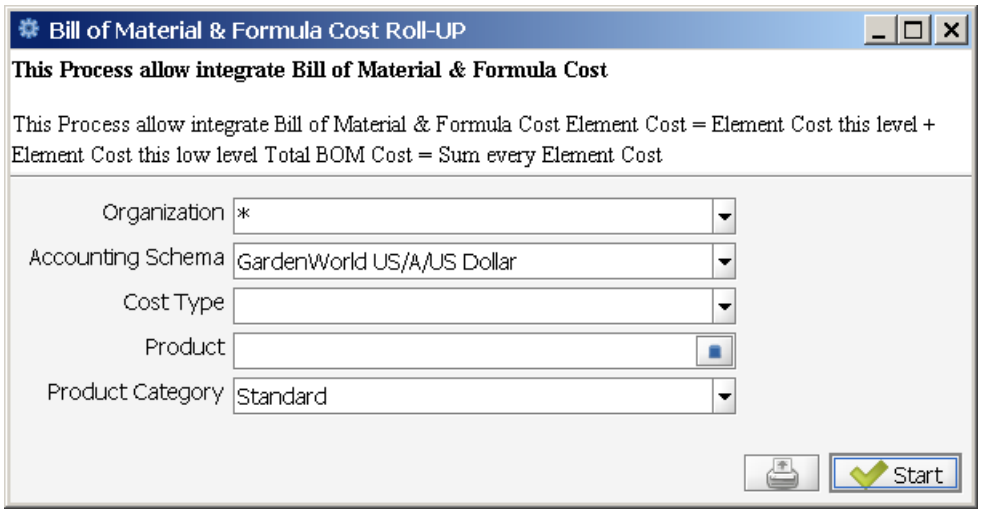
8.6 Cost Workflow & Process Details

Menu: Manufacturing Management < Standard Costing Management < Cost Workflow & Process Details



8.7 Bill of Material & Formula Cost Roll-Up

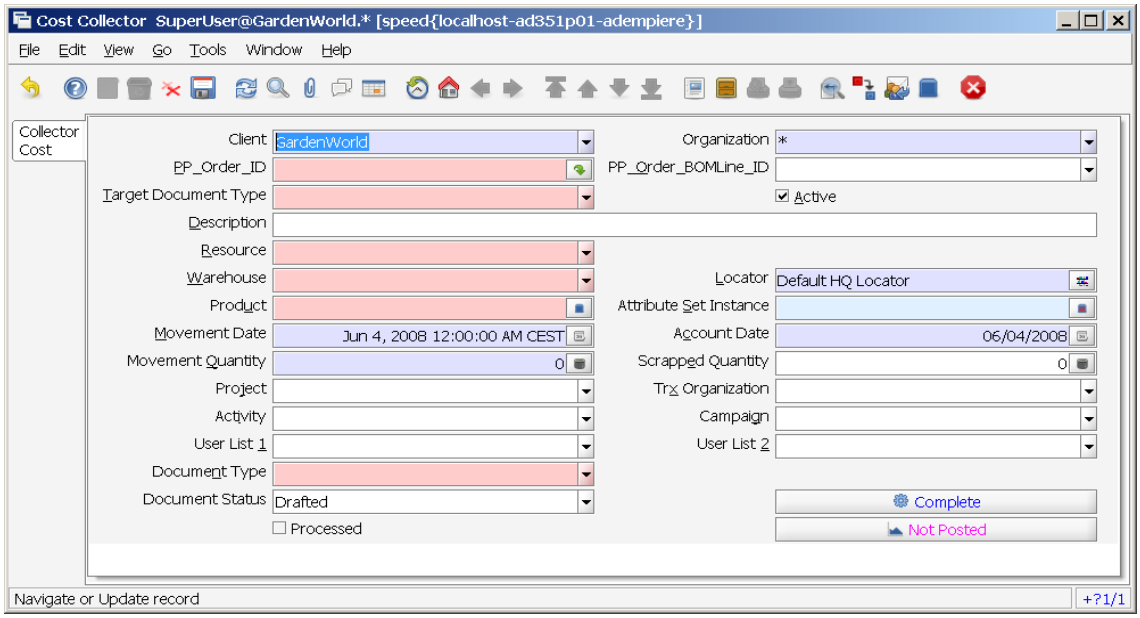
Menu: Manufacturing Management < Standard Costing Management < Bill of Material & Formula Cost Roll-Up



8.8 Cost Collector

Menu: Manufacturing Management < Standard Costing Management < Cost Collector

The cost collector is a repository of all the MO transactions. This real transactions relation allows to compare it with the standard transactions in order to be able to calculate variations by cost element.
To get access to the Cost Collector you must select the menu option Manufacturing< Costing Management < Cost Collector then the next window is displayed:



9 Simulation

There have been seen many simulation extensions on various window:tabs. This will be addressed in this chapter.

Simulation seems to be misleading. The Simulation groups within the various manufacturing tabs are used to set the time, quantity and usage values.

Perhaps another term should be used.