



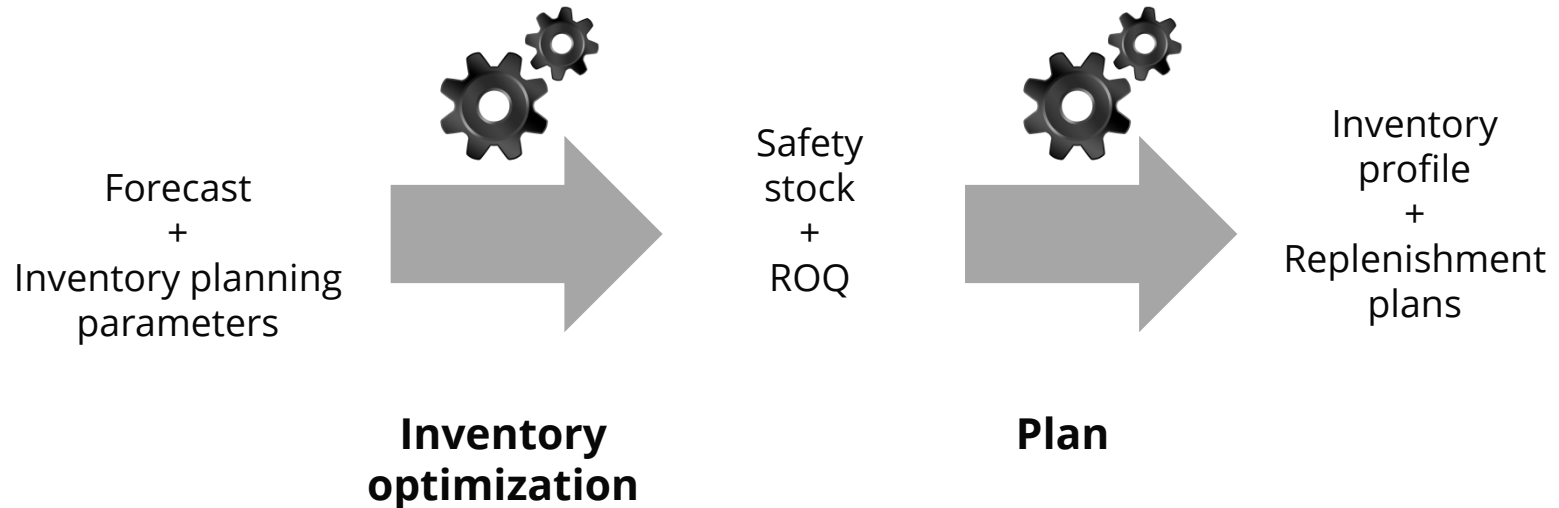
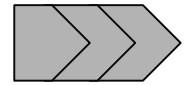
Open source supply chain planning software

Introduction for inventory planners

Agenda

- Inventory planning workflow
 - Safety stock and reorder quantity calculation
 - Inventory plan review
- A day in the life of an inventory planner
 - Cockpit screen
 - Distribution planning screen
 - Inventory and inventory detail reports

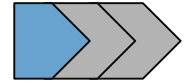
Inventory planning workflow



Workflow steps:

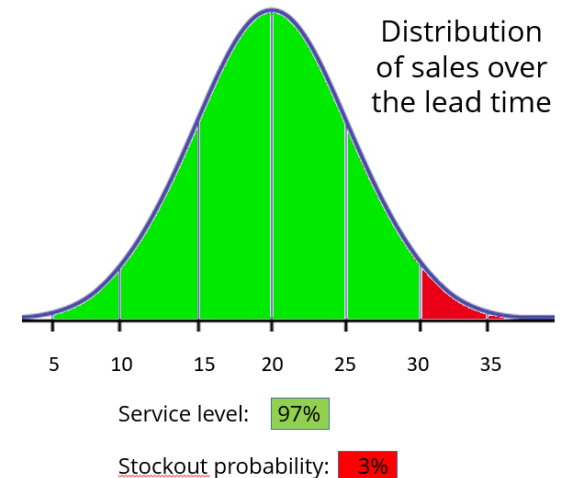
1. Safety stock generation
2. Reorder quantity generation
3. Safety stock, ROQ and inventory review and analysis

Inventory planning workflow

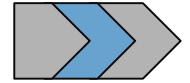


1 Safety stock calculation

- Three calculation steps
 1. Compute a safety stock based on the **service level**, based on:
 - Demand forecast
 - Expected customer service level
 - Demand variability
 - Supplier lead time variability
 2. Constrain the output of step 1 to be within a minimum and maximum **quantity**
 3. Constrain the output of step 2 to be within a minimum and maximum **period of cover**

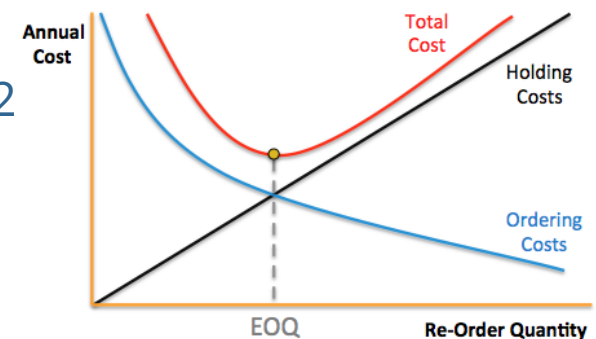


Inventory planning workflow



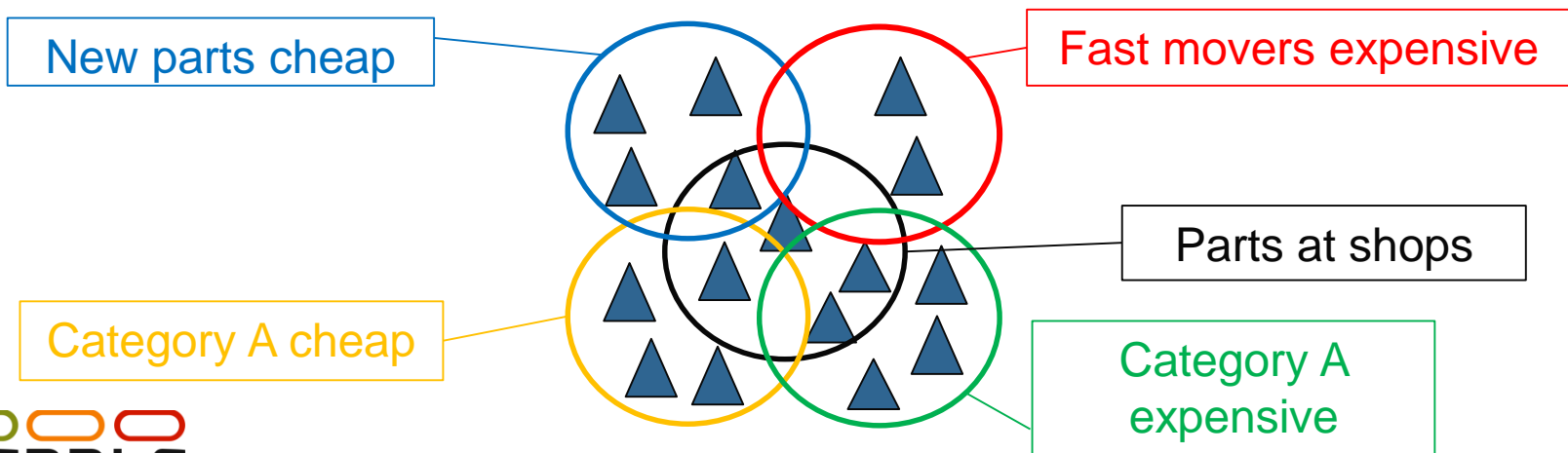
2 Reorder quantity calculation

- Three calculation steps
 1. Compute a **economic reorder quantity** using the Wilson formula, based on:
 - K = Fixed ordering cost
 - D = SKU forecast
 - h = Annual holding cost rate
 2. Constrain the output of step 1 to be within a minimum and maximum **quantity**
 3. Constrain the output of step 2 to be within a minimum and maximum **period of cover**



Manage inventory policies

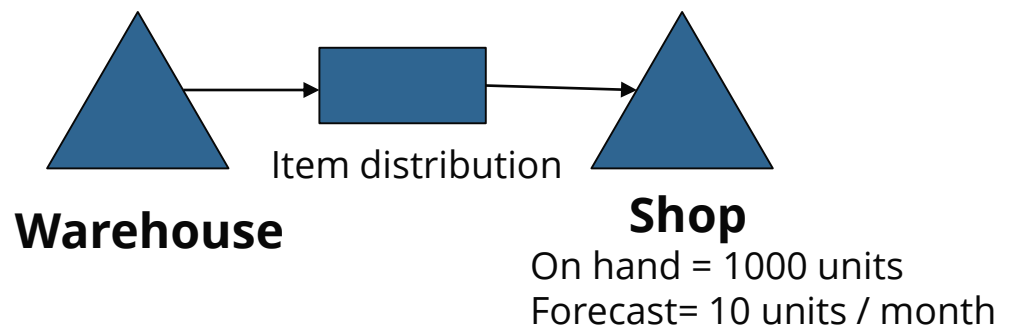
- Safety stock and reorder policies can be defined:
 - For individual item x location pairs
 - For segments: a group of item x locations
 - Segments are defined based on item and location characteristics:
eg `item.cost > 10` and `location.category = 'shop'`
 - Business rules are applied to all item x locations in a segment
eg `service level = 95%` for all item x locations in the segment



Stock rebalancing

- FrePPLe can identify opportunities for stock rebalancing
 - Excess inventory at a location can be returned to its source location if it meets these conditions:
 - Part cost is high enough
 - Total cost of the returned material is high enough
 - The excess doesn't "burn off" within a certain time

Example:
Shop has stock to cover
more than 8 years of demand

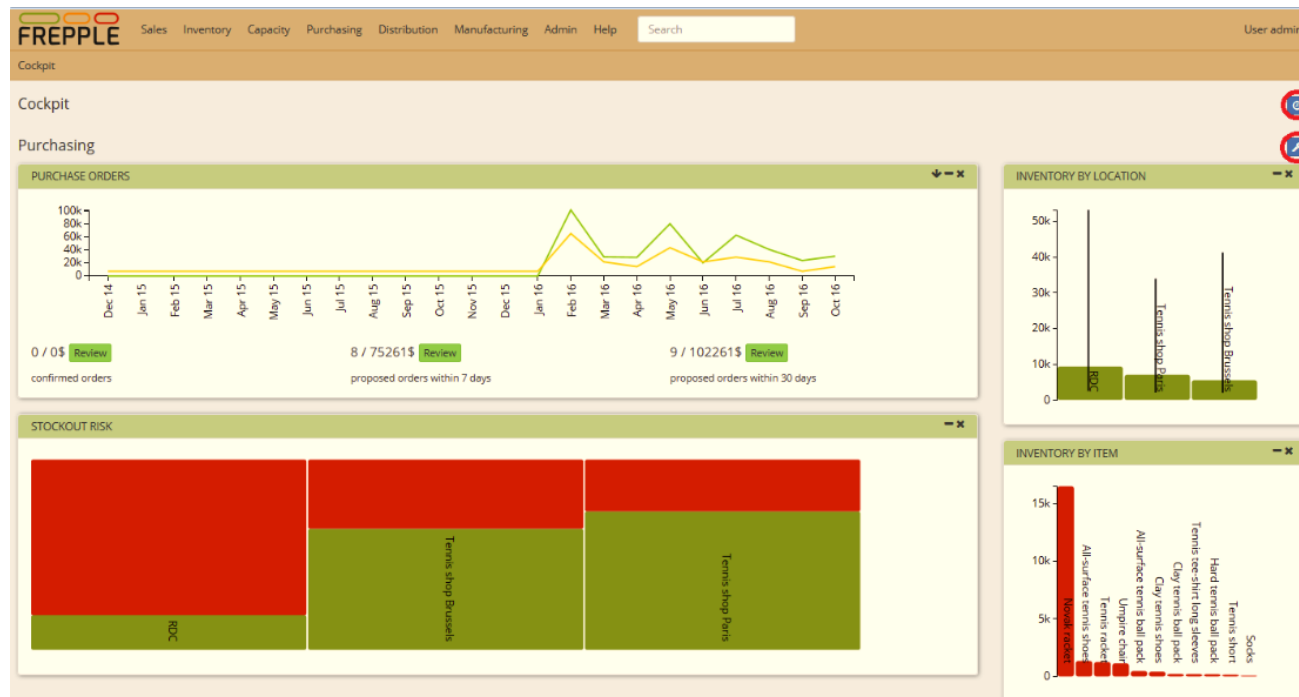


Agenda

- Inventory planning workflow
 - Safety stock and reorder quantity calculation
 - Safety stock and reorder quantity review and analysis
- A day in the life of a inventory planner
 - Cockpit screen
 - Inventory planning screen
 - Inventory and inventory detail reports

Cockpit screen

- All users workflows start their work on the cockpit screen
- Every user can configure a personal dashboard with the widgets that fit his/her tasks
- For an inventory planner the following widgets can be useful:
 - Inventory by Item
 - Inventory by location
 - Stockout risk
 - Purchase orders



Inventory Planning : Top section

- The inventory planning screen is the main screen for safety stock and ROQ review
- The top section displays a grid providing relevant information for current period such as :
 - Stockout risk
 - Safety stock
 - ROQ
 - Open PO
 - Proposed PO
 - ...

FREPPLE Sales Inventory Capacity Purchasing Distribution Manufacturing Admin Help Search

Context: Forecast Report Distribution planning

Distribution planning

No grouping

Item	Location	Lead Time	Price	Stockout	Local Inv	Dependent Demand	Safety St	Reorder Quantity	On Hand	Overdue	Open Sell	Open Pur	Open Tra	Proposed	Proposed	Description	Category	Subcategory
All-surface tennis ball pack	RDC	7	7.505	0,00	0	0	0	1	25	0	0	0	0	0	0	4 yellow balls for all surfaces	Tennis ball pack	
All-surface tennis ball pack	Tennis shop Brussels	3	7.505	0,00	13	0	3	131	18	0	0	0	0	0	0	4 yellow balls for all surfaces	Tennis ball pack	
All-surface tennis ball pack	Tennis shop Paris	3	7.505	0,00	15	0	3	144	20	0	0	0	0	0	0	4 yellow balls for all surfaces	Tennis ball pack	
All-surface tennis shoes	RDC	10	75.005	99,51	0	0	10	86	9	0	0	0	0	0	86	All surface tennis shoes	Tennis shoes	
All-surface tennis shoes	Tennis shop Brussels	3	75.005	0,00	5	0	5	25	6	0	0	0	0	0	0	All surface tennis shoes	Tennis shoes	
All-surface tennis shoes	Tennis shop Paris	3	75.005	2,46	6	0	2	29	3	0	0	0	0	0	0	All surface tennis shoes	Tennis shoes	
Clay tennis ball pack	RDC	7	6.005	0,00	0	0	0	1	15	0	0	0	0	0	0	4 tennis balls in a pack for clay	Tennis ball pack	
Clay tennis ball pack	Tennis shop Brussels	3	6.005	0,00	8	0	2	116	10	0	0	0	0	0	0	4 tennis balls in a pack for clay	Tennis ball pack	
Clay tennis ball pack	Tennis shop Paris	3	6.005	0,00	6	0	1	98	13	0	0	0	0	0	0	4 tennis balls in a pack for clay	Tennis ball pack	
Clay tennis shoes	RDC	10	60.005	29,89	0	0	5	37	4	0	0	0	0	0	37	Clay tennis shoes	Tennis shoes	

Page 1 of 1

View 1 - 33 of 33

Buffer: Tennis short @ Tennis shop Brussels

SAVE UNDO RECALCULATE

	Feb 16	Mar 16	Apr 16	May 16	Jun 16	Jul 16	Aug 16	Sep 16	Oct 16
Reorder quantity	22	27	19	33	77	45	13	14	
Reorder quantity override									
Safety stock	2	3	1	2	2	2	2	1	
Safety stock override									
Starting inventory	1	12	20	4	30	53	7	12	15
Local demand	11	19	16	7	54	46	38	10	6
Dependent demand	0	0	0	0	0	0	0	0	0
Total demand	11	19	16	7	54	46	38	10	6
Confirmed supply	0	0	0	0	0	0	0	0	0
Proposed supply	22	27	0	33	77	0	43	13	0
Total supply	22	27	0	33	77	0	43	13	0
Ending inventory	12	20	4	30	53	7	12	15	9

Parameters

Reorder quantity

Economic order quantity: 80 units

Quantity: 0 units

Period of cover: 45 days

Don't stock

Safety stock

Service level: 95%

Minimum: 80 units

Demand standard deviation: 0 units

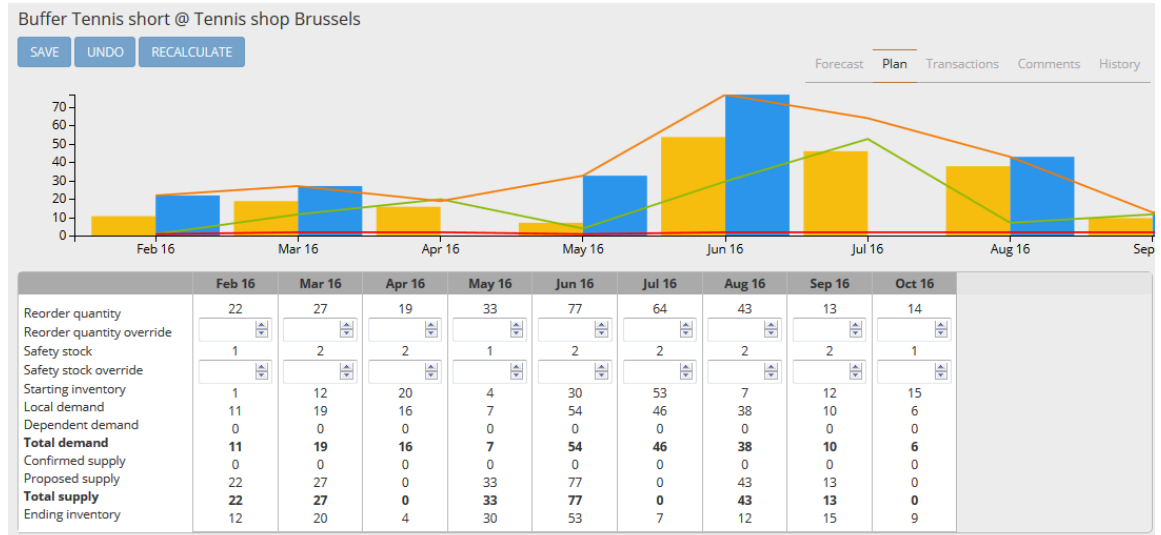
Lead time standard deviation: 0 days

Quantity: 0 units

Period of cover: 0 days

Inventory Planning : Middle section

- The middle section offers many tabs to review the forecast, the plan, the transactions...
- In the plan tab, the safety stock, the ROQ, the starting and ending inventory are displayed for current and future periods



Distribution Planning : Middle section

- The transaction tab allows the planner to:
 - Review purchase orders and distribution orders needed to obtain the desired inventory profile
 - Export them to the ERP system

Buffer Novak racket @ Tennis shop Brussels

SAVE UNDO RECALCULATE Select action ▾

Forecast Plan **Transactions** Comments History

<input type="checkbox"/>	Date↑	Type	Reference	Status	Item	Location	Origin
<input type="checkbox"/>	2016-02-19 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC
<input type="checkbox"/>	2016-03-16 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC
<input type="checkbox"/>	2016-05-16 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC
<input type="checkbox"/>	2016-06-16 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC
<input type="checkbox"/>	2016-08-16 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC
<input type="checkbox"/>	2016-09-16 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC
<input type="checkbox"/>	2016-11-16 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC
<input type="checkbox"/>	2016-12-16 00:00:00	DO In		proposed	Novak racket	Tennis shop Brussels	RDC

Inventory Planning : Bottom section

- The bottom section allows the planner to modify the stocking policy for a SKU by selecting the method to calculate the safety stock and the reorder quantity
 - Check the system proposal
 - See the constraints specified by the segments and business rules
 - Override and constrain the system proposal

Safety stock	Reorder quantity
Computed safety stock: 0 units	Computed economic reorder quantity: 0 units
Service level: <input type="text" value="98"/> %	Constrained by:
Demand standard deviation: <input type="text" value="21"/> units	Quantity between: <input type="text"/> and <input type="text"/> units
Lead time standard deviation: <input type="text" value="0"/> days	Period of cover between: <input type="text"/> and <input type="text"/> days
Constrained by:	
Quantity between: <input type="text"/> and <input type="text"/> units	
Period of cover between: <input type="text"/> and <input type="text"/> days	
	Do not stock
	Sets safety stock to 0 and reorder quantity to 1 <input type="text" value="Default"/>

Chat with us ^

Distribution orders

- The distribution order screen gives a prioritized list of stock transfers:
 - RED:** Need urgent planner attention
 - Expedite to avoid a stockout
 - Time to place a new purchase order
 - ORANGE:** Need planner attention
 - Time to place a new purchase order
 - GREEN:** No action required yet
 - Time to place a new purchase order
- Bottom section of the screen shows full detail on the selected record(s)

The screenshot shows the FREPPLE software interface for Distribution Orders. The main table lists several orders with columns for Identifier, Reference, Inventory Status, Item, Origin, Destination, and Start Date. The first order (8926) is highlighted in orange, indicating it needs urgent attention. Below the table, a detailed view for the selected order is shown, including fields for Item, Origin, Destination, Start Date, End Date, Quantity, Criticality, Delay, and Status. The status is currently 'Proposed'. To the right, there is a bar chart showing the inventory status for the selected item, with a green bar representing current onhand (23) and a red bar representing current onhand (1). Below the chart, there are sections for Problems, Resource, Buffer, and Demand, each with a table of data.

Identifier	Reference	Inventory Status	Item	Origin	Destination	Start Date
8926		50%	Tennis racket	RDC	Tennis shop Brussels	2016-02-22 00:00:00
8993		100%	Tennis tee-shirt long sleeves	RDC	Tennis shop Brussels	2016-02-16 00:00:00
8961		100%	Tennis short	RDC	Tennis shop Brussels	2016-02-16 00:00:00
9022		100%	Umpire chair	RDC	Tennis shop Brussels	2016-02-01 00:00:00
8930		100%	Tennis racket	RDC	Tennis shop Paris	2016-02-22 00:00:00
8802		100%	Clay tennis shoes	RDC	Tennis shop Paris	2016-02-11 00:00:00
8964		100%	Tennis short	RDC	Tennis shop Paris	2016-02-16 00:00:00

Distribution Order		Ship Tennis Racket From Tennis Racket @ RDC To Tennis Racket @ Tennis Shop Brussels	
Item	Tennis racket		
Origin	RDC		
Destination	Tennis shop Brussels		
Start Date	2016-02-22 00:00:00		
End Date	2016-02-25 00:00:00		
Quantity	23		
Criticality	0		
Delay	7		
Status	Proposed	Approved	Confirmed
	Closed		

Inventory Status		Tennis Racket@Tennis Shop Brussels	
Onhand At Lead Time	100	25	
Current Onhand	23	1	

Problems	Start	End
no problems		

Resource	Quantity
no resources	

Buffer	Quantity	Onhand	Date
Tennis racket @ RDC	-23	0	2016-02-22T00:00:00
Tennis racket @ Tennis shop Brussels	23	23	2016-02-25T00:00:00

Demand	Quantity
Tennis racket @ Tennis shop Brussels - 2016-04-01	5
Tennis racket @ Tennis shop Brussels - 2016-06-01	2

Purchase orders

- The purchase order screen gives a prioritized list of open and proposed purchases:
 - RED:** Need urgent planner attention
 - Expedite to avoid a stockout
 - Time to place a new purchase order
 - ORANGE:** Need planner attention
 - GREEN:** No action required yet
- Bottom section of the screen shows full detail on the selected record(s)

The screenshot shows the FREPPLE interface for Purchase Orders. The top navigation bar includes 'Sales', 'Inventory', 'Capacity', 'Purchasing', 'Manufacturing', 'Admin', and 'Help'. The breadcrumb trail is 'Cockpit > Forecast Report > Forecast Editor > Inventory Planning > Purchase Orders'. The main table lists purchase orders with columns for Identifier, Reference, Inventory Status, Item, Location, Supplier, and Start Date. Order 8658 is highlighted in green, indicating it is a 'GREEN' status. Below the table, the detailed view for 'Purchase Clay Tennis Ball Pack @ RDC From Tennis Material Supplier' is shown. This view includes fields for Item, Supplier, Location, Start Date, End Date, Quantity (387), Criticality (94.958333), and Delay (-108). It also features status buttons: Proposed, Approved, Confirmed, and Closed. To the right, an 'Inventory Status' chart shows 'Clay Tennis Ball Pack@RDC' with an onhand quantity of 392 and a current onhand of 387. Below the chart are sections for 'Problems' (no problems), 'Resource' (no resources), 'Buffer' (Clay tennis ball pack @ RDC with quantity 387, onhand 402, date 2016-02-08T00:00:00), and 'Demand' (Clay tennis ball pack @ Tennis shop Paris - 2016-07-01 with quantity 24, and Clay tennis ball pack @ Tennis shop Brussels - 2017-01-01 with quantity 6).

Other screens

- Other screens used for occasional review and analysis, depending on the inventory planners' responsibilities:
 - Alerts for excess inventory
 - Identifies item-locations with on hand level exceeding the planned maximum
 - Purchase order analysis
 - Review already confirmed open purchase orders that are critical. You should contact the supplier of critical purchase orders to expedite the delivery.
 - Inventory report
 - Review the inventory profile for a series of item x locations
 - Inventory detail report
 - Review the details of all material consumption and production

Try it out yourself

Online demos can be accessed at:

<https://manufacturing.frepple.com>

<https://distribution.frepple.com>

User : admin

Password : admin

Hint:

Use the "guided tour" to walk through the "day-in-the-life" workflows