

# 11

## MATERIAL REQUIREMENT PLANNING ON A CLOUD SOA-ERP SYSTEM

MGT2405, University of Toronto, Denny Hong-Mo Yeh

### Introduction

In this chapter, we demonstrate the MPS/MRP procedure using an enterprise resources planning system on the cloud - NEO SOA-ERP. NEO is the acronym of Neo Enterprise Orchestration which is a service-oriented architectural ERP system developed by Lancer Systems Co. in Taiwan. Topics include item and BOM, shop calendar, planning fundamental data including forecast type and supply-demand type, forecast sheet, supply-demand data including on-hand and on-order inventory (scheduled receipts), netting sales orders from forecast, low-level-code calculation, executing MPS, releasing work orders for finished goods, executing MRP, releasing purchase requisitions for raw materials. In the planning process, allocation of supply to demand, MPS/MRP time-phased order point results, and planned order messages are also discussed. We also discuss the impacts of safety stock, safety time, yield rate, and scrap rate on MRP results. NEO SOA-ERP can be reached from many cloud platforms including the followings:

- The Cloud Service Research Center (CSRC) at Fu Jen Catholic University  
(<https://sites.google.com/a/csrc.im.fju.edu.tw/csrc/neo-soa-erp>).
- Lancer01 Cloud ERP at Lancer Systems Inc.  
(<http://211.75.139.31:8280/NEOWeb/>)
- Learning materials of NEO SOA-ERP can be found in the following address:  
(<http://140.136.155.3/lancerstudy/>)

## Fundamental Data

### ● Item and BOM

Create an aggregate product "shoe\_agg" with a BOM code "shoe" where "black\_shoe" and "white\_shoe" are defined as its children. The attributes of the related items are as the following:

Item	Inventory Control	Phantom Item	Forecast Item	MPS Item	Planned Order Item
shoe_agg	N	Y	N	Y	N
black_shoe	Y	N	Y	Y	Y
white_shoe	Y	N	Y	Y	Y

Item - CORB2105 [Entity:erp10g1-erp10g1]

View DataOperation DataOutput ExtraTools Exit

Entity	EntityName	ItemID	ItemChineseName	ItemEnglishName	Specification	DetailSpec	ItemStatus	Remark
erp10g1	erp10g1	sho...	shoe_agg	shoe_agg	shoe_agg		ACTIVE	

BasicData SalesData InventoryData InspectionData PlanningData CostData AnalysisData

Entity: erp10g1 erp10g1

ItemID: shoe\_agg

ItemChineseName: shoe\_agg

ItemEnglishName: shoe\_agg

Specification: shoe\_agg

DetailSpec:

ItemStatus: ACTIVE

Grouping

InventoryType:

SubInventoryType:

ProductLine:

SubProductLine:

IsInventoryControlItem: ☐

IsPhantomItem: ☒

IsComponentItemStructureDocument: ☐

IsProjectControl: ☐

Item - CORE2105 [Entity:erp10g1-erp10g1]

View DataOperation DataOutput ExtraTools Exit

Entity	EntityName	ItemID	ItemChineseName	ItemEnglishName	Specification	DetailSpec	ItemStatus	Remark	InventoryType	Inven
erp10g1	erp10g1	sho...	shoe_agg	shoe_agg	shoe_agg		ACTIVE			

BasicData SalesData InventoryData InspectionData PlanningData CostData AnalysisData RemarkData Replace

PlanningSourceType: ☒ Manufacture ☐ Purchase ☐ Subcontract ☐ Transfer

BOM: shoe shoe

Routing:

IsForecastItem: ☐

IsMPSItem: ☒

OrderPolicy: ☐ MRP ☒ Other

IsPlannedOrderItem: ☒

IsCriticalItem: ☐

PRFilterCode:

RequirementPlanning

LotSizingRule: POQ

OrderInterval: 7

FixedOrderQuantity: 0

SmallestOrderQuantity: 0

LargestOrderQuantity: 0

OrderQuantityMultiple: 1

LeadTime: 0

SafetyTime: 0

材料表維護 - CORB2301 [Entity : 0020-0020]

View DataOperation DataOutput SingleRowButtons ExtraTools Exit

SequenceNo 1

Entity	EntityName	BOMID	BOMName	BOMType	Re...	BOMAnalysisCriter...	BOMAnalysisCriteria1N...
0020	0020	black_shoe	black_shoe	Assembly			
0020	0020	shoe	shoe	Planning			

BasicData AnalysisData MaterialData EngineeringChangeData ApplyItemQuery

SequenceNo	Item	InventoryUM	EarliestEffectiveDate	LatestEffectiveDate	Structure	QuantityPer	BaseQuantityPer
0010	black_shoe	EA	2011/12/06	9999/12/31	Planning	7.00000000	10.00000000
0020	white_shoe	EA	2011/12/06	9999/12/31	Planning	3.00000000	10.00000000

The aggregate product, shoe\_agg, is a phantom item which means it is not a real item. Instead, it is an item representing the real items black\_shoe and white\_shoe. The BOM with shoe\_agg as the parent item and black\_shoe and white\_shoe as the components is a "phantom BOM" for black\_shoe and white\_shoe are not real components of shoe\_agg. The "quantity per" over "base quantity per" for black\_shoe and white\_shoe are 0.7 and 0.3, respectively, which are the predicted preference of the customers, i.e., 70% of the customers prefer black shoes and 30% customers prefer white shoes.

The standard non-phantom, or real, items are as the following:

Item - CORE2105 [Entity : erp10g1-erp10g1]

檢視 DataOperation DataOutput 附加工具區 ExitArea

Entity	ItemID	ItemEnglishName	Specification	InventoryUM	ABCClass...	StockType
erp10g1	black_shoe	Black shoe	Black shoe	ea	A	FSG-01
erp10g1	white_shoe	White shoe	White shoe	ea	A	FSG-01
erp10g1	black_face	Black face	Black face	ea	B	MAT-01
erp10g1	mid_sole	Mid sole	Mid sole	ea	B	MAT-01
erp10g1	out_sole	Out sole	Out sole	ea	C	MAT-01
erp10g1	white_face	White face	White face	ea	B	MAT-01

The standard BOMs are as the following:

## Material Requirement Planning on a Cloud SOA-ERP System

**BOM - CORB2301 [Entity:erp10g1-erp10g1]**  
View DataOperation DataOutput ExtraTools Exit

Entity EntityName BOMID BOMName BOMType Remark  
erp10g1 erp10g1 black\_shoe black\_shoe Assembly

BasicData AnalysisData **MaterialData** EngineeringChangeData ApplyItemQuery

SequenceNo	Item	InventoryUM	EarliestEffectiveDate	LatestEffectiveDate	Structure	QuantityPer
0010	black_face	ea	2010/10/11	9999/12/31	Normal	1.00000000
0020	mid_sole	ea	2010/10/11	9999/12/31	Normal	1.00000000
0030	out_sole	ea	2010/10/11	9999/12/31	Normal	1.00000000

**BOM - CORB2301 [Entity:erp10g1-erp10g1]**  
View DataOperation DataOutput ExtraTools Exit

Entity EntityName BOMID BOMName BOMType Remark  
erp10g1 erp10g1 black\_shoe black\_shoe Assembly  
erp10g1 erp10g1 white\_shoe white\_shoe Assembly

BasicData AnalysisData **MaterialData** EngineeringChangeData ApplyItemQuery

SequenceNo	Item	InventoryUM	EarliestEffectiveDate	LatestEffectiveDate	Structure	QuantityPer
0010	white_face	ea	2010/10/11	9999/12/31	Normal	1.00000000
0020	mid_sole	ea	2010/10/11	9999/12/31	Normal	1.00000000
0030	out_sole	ea	2010/10/11	9999/12/31	Normal	1.00000000

Check BOM explosion to make sure the BOMs are correct.

**BOMExplosion - CORB2304 [Site:erp10g1-erp10g1] [Item:black\_shoe-Assembly]**  
View DataOperation DataOutput ExtraTools Exit

層次	BOM	BOMType	SequenceNo	Item	QuantityPer	InventoryUM
1	black_shoeAssembly0010			black_face	1.00000000	ea
1	black_shoeAssembly0020			mid_sole	1.00000000	ea
1	black_shoeAssembly0030			out_sole	1.00000000	ea

層次	BOM	BOMType	SequenceNo	Item	QuantityPer	InventoryUM
1	white_shoeAssembly0010			white_face	1.00000000	ea
1	white_shoeAssembly0020			mid_sole	1.00000000	ea
1	white_shoeAssembly0030			out_sole	1.00000000	ea

### ● Shop Calendar

Create a shop calendar or use an existing one. The following is an example of shop calendar:

ShopCalendar - CORB1602 [Site : erp10g1-erp10g1]

View DataOperation DataOutput ExtraTools Exit

Site	SiteName	ShopCalendarID	ShopCalendarName	WorkTime	Remark	OperationDate	Operator
erp10g1	erp10g1	erp10g1	erp10g1	08:00:00		2010/12/06	erp10...

BasicData WeeklyWorkDayData ScheduledHolidayData CalendarData

Date	WorkdaySequenceNo	IsWorkday	DayOfWeek	WorkTime	OperationDate	Operator
2011/12/19	311.	Y	Monday	08:00:00	2010/12/06	erp10...
2011/12/20	312.	Y	Tuesday	08:00:00	2010/12/06	erp10...
2011/12/21	313.	Y	Wednesday	08:00:00	2010/12/06	erp10...
2011/12/22	314.	Y	Thursday	08:00:00	2010/12/06	erp10...
2011/12/23	315.	Y	Friday	08:00:00	2010/12/06	erp10...
2011/12/24	0.	N	Saturday	08:00:00	2010/12/06	erp10...
2011/12/25	0.	N	Sunday	08:00:00	2010/12/06	erp10...
2011/12/26	316.	Y	Monday	08:00:00	2010/12/06	erp10...
2011/12/27	317.	Y	Tuesday	08:00:00	2010/12/06	erp10...
2011/12/28	318.	Y	Wednesday	08:00:00	2010/12/06	erp10...
2011/12/29	319.	Y	Thursday	08:00:00	2010/12/06	erp10...
2011/12/30	320.	Y	Friday	08:00:00	2010/12/06	erp10...
2011/12/31	0.	N	Saturday	08:00:00	2010/12/06	erp10...

When creating a shop calendar, apply ShopCalendar program. “WorkTime” is the working time in a day. The format is “hour:minute:second”. In WeeklyWorkDayData tab, we specify the work days followed by the off days. In CalendarData tab, we use BatchAdd to create the work dates. The day of the first work date must be Monday. The day of the last work date is better to be Sunday for easier extension of the calendar in the future.

ShopCalendar - CORB1602 [Site : erp10g1-erp10g1]

View DataOperation DataOutput ExtraTools Exit

Site	SiteName	ShopCalendarID	ShopCalendarName	WorkTime	Remark	OperationDate
erp10g1	erp10g1	erp10g1	erp10g1	08:00:00		2010/10/11

BasicData WeeklyWorkDayData ScheduledHolidayData CalendarData

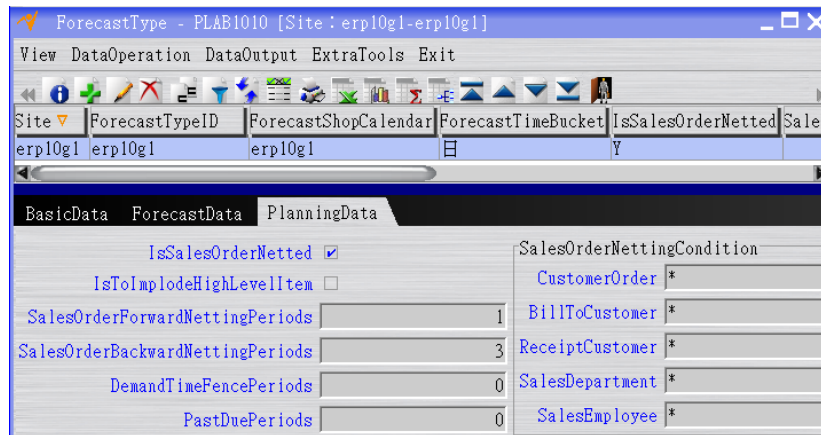
SequenceNo	WorkDays	OffDays	OperationDate	Operator
0010	5.	2.	2010/10/11	erp10g1 erp10g1

BasicData WeeklyWorkDayData ScheduledHolidayData CalendarData

Date	WorkdaySequenceNo	IsWorkday	DayOfWeek	WorkTime	OperationDate	Operator
2010/10/11	1.	Y	Monday	08:00:00	2010/10/11	erp10g1
2010/10/12	2.	Y	Tuesday	08:00:00	2010/10/11	erp10g1
2010/10/13	3.	Y	Wednesday	08:00:00	2010/10/11	erp10g1
2010/10/14	4.	Y	Thursday	08:00:00	2010/10/11	erp10g1
2010/10/15	5.	Y	Friday	08:00:00	2010/10/11	erp10g1
2010/10/16	0.	N	Saturday	08:00:00	2010/10/11	erp10g1
2010/10/17	0.	N	Sunday	08:00:00	2010/10/11	erp10g1
2010/10/18	6.	Y	Monday	08:00:00	2010/10/11	erp10g1
2010/10/19	7.	Y	Tuesday	08:00:00	2010/10/11	erp10g1
2010/10/20	8.	Y	Wednesday	08:00:00	2010/10/11	erp10g1

- *Forecast Type and Supply-Demand type*

When creating a forecast type, users can select a time bucket length including day, week, bi-week or month. In discontinuous demand situation, on time delivery for each customer order is important, time bucket of day should be selected. In continuous demand situation, week time bucket can be a choice. In the long lead time situation such as construction, month time bucket can be chosen. Due to the increasing computing power of current computers, time buck of day is selected in most of the cases. A shop calendar must be defined first then assigned to a forecast type. Users can also specify how the sales orders are netted from the forecasting data. For example, if the sales order forward netting period is 1 and the sales order backward netting period is 3, then the forecast quantities from the date of one day before sales order delivery date to the date of three days after sales order delivery date will be cancelled by the sales order quantity. The purpose of netting sales order quantities from the sales forecast is to obtain correct gross requirement (GR) for MRP calculation.



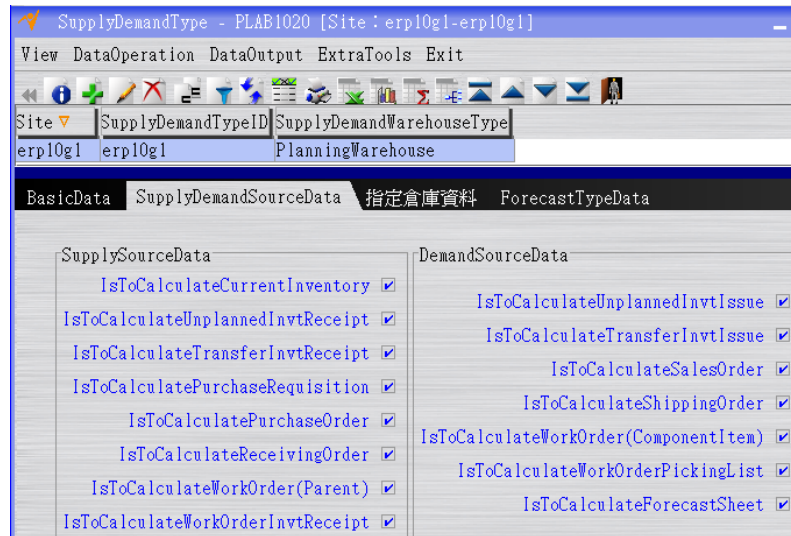
Site	ForecastTypeID	ForecastShopCalendar	ForecastTimeBucket	IsSalesOrderNetted	Sales
erp10g1	erp10g1	erp10g1		Y	

PlanningData	
IsSalesOrderNetted	<input checked="" type="checkbox"/>
IsToImplodeHighLevelItem	<input type="checkbox"/>
SalesOrderForwardNettingPeriods	1
SalesOrderBackwardNettingPeriods	3
DemandTimeFencePeriods	0
PastDuePeriods	0
SalesOrderNettingCondition	
CustomerOrder	*
BillToCustomer	*
ReceiptCustomer	*
SalesDepartment	*
SalesEmployee	*

When creating a SupplyDemandType, users can specify the supply and demand source data. Only the selected supply and demand source data will be considered by the Planning system of NEO SOA-ERP. Users must also select a forecast type. All the forecast data with the specified forecast type will be considered by the Planning system.





## Business Processes

- *Check the Initial States before Planning*

The on-hand inventory is as the followings:

OnHandInventory - CORB6203

View DataOperation DataOutput ExtraTools Exit

Item	Ware...	InventoryUM	InventoryQuantity	ReserveQuantity	AvailableQuantity
black_face	erp10g1	ea	340.00000000	0.00000000	340.00000000
black_shoe	erp10g1	ea	380.00000000	0.00000000	380.00000000
mid_sole	erp10g1	ea	670.00000000	0.00000000	670.00000000
out_sole	erp10g1	ea	540.00000000	0.00000000	540.00000000
white_face	erp10g1	ea	240.00000000	0.00000000	240.00000000
white_shoe	erp10g1	ea	10.00000000	0.00000000	10.00000000

There is only one scheduled receipt:

WorkOrder - MFGF1010 [Site: erp10g1-erp10g1]

View DataOperation DataOutput SingleRowButtons MultipleRowButtons ExtraTools Exit

Site	WorkOrderNo	Status	Item	WorkOrderFinishDate	FinishQuantity
erp10g1	W01010000006	Confirm	black_shoe	2010/10/27	10.00000000

BasicData SalesOrderData ManufacturingData RemarkData ComponentItemData Rout

...	Status	ComponentItemItem	Structure	PlannedIssueDate	QuantityPer	PlannedIssueQuantity
0010	已領足	black_face	Normal	2010/10/27	1.00000000	10.00000000
0020	已領足	mid_sole	Normal	2010/10/27	1.00000000	10.00000000
0030	已領足	out_sole	Normal	2010/10/27	1.00000000	10.00000000

- *Maintain Forecast Sheet*

Sales forecast data are maintained in a forecast sheet. A forecast sheet must belong to a forecast type. Multiple products' forecasting data on various dates can be defined in a forecast sheet, and the dates can not exceed the shop calendar of the forecast type. The forecasting data of all the forecast sheets of all the forecast types defined in a "supply demand type" which is specified in a "MRP Execution" are considered during the MRP calculation.

Site	ForecastSheet	Status	ForecastType	EarliestEffectiveDate	LatestEffectiveDate
erp10g1	PF1011000005	Confirmerp10g1		2010/11/24	9999/12/31

Seq	Item	InventoryUM	IsForecastItem	StartDate	EndDate	AggregateForecastQuantity
0080	shoe_agg	EA	N	2010/12/03	2010/12/03	200.000
0090	shoe_agg	EA	N	2010/12/06	2010/12/06	200.000
0100	shoe_agg	EA	N	2010/12/07	2010/12/07	200.000
0110	shoe_agg	EA	N	2010/12/08	2010/12/08	200.000
0120	shoe_agg	EA	N	2010/12/09	2010/12/09	200.000
0130	shoe_agg	EA	N	2010/12/10	2010/12/10	200.000
0140	shoe_agg	EA	N	2010/12/13	2010/12/13	200.000
0150	shoe_agg	EA	N	2010/12/14	2010/12/14	200.000
0160	shoe_agg	EA	N	2010/12/15	2010/12/15	200.000
0170	shoe_agg	EA	N	2010/12/16	2010/12/16	200.000
0180	shoe_agg	EA	N	2010/12/17	2010/12/17	200.000
0190	shoe_agg	EA	N	2010/12/20	2010/12/20	200.000

When the forecast sheet is in Open status, click DetailForecastDataGeneration button first, then click Confirm button. DetailForecastDataGeneration explodes the forecast data of the phantom item "shoe\_agg" into the forecast data of the non-phantom items "black\_shoe" and "white\_shoe" according to the phantom BOM, sometimes called planning BOM, of "shoe\_agg". In this example, the sales forecast of "shoe\_agg" is 200 in each period, after clicking DetailForecastDataGeneration button, the forecast quantity in each period for black shoe is 140 and that for white shoe is 60.

- *Netting the sales order quantity from forecast*

Suppose we received a sales order buying 1000 black shoes and 1000 white shoes, we create a new sales order in the NEO SOA-ERP system:



## Material Requirement Planning on a Cloud SOA-ERP System

SalesOrder - DISF1020 [Entity: erp10g1-erp10g1]

View DataOperation DataOutput ActionArea MultipleRowButtons ExtraTools Exit

Site SalesOrderNo Status Entity OpenDate OrderDate BillToCustomer SalesType

erp10g1 SO1012000020 Open erp10g1 2010/12/07 2010/12/07 erp10g1 default\_sales\_type

BasicData OrderData RemarkData SalesData UnshippedQuantityQuery ShippingOrderQuery

SequenceNo	ItemID	ScheduledDeliveryDate	ShippingWarehouse	OrderQuantity	UnitPrice	OrderAmount
0010	black_shoe	2010/12/13	erp10g1	1,000.00000000	100.00	100,000.00
0020	white_shoe	2010/12/13	erp10g1	1,000.00000000	90.00	90,000.00

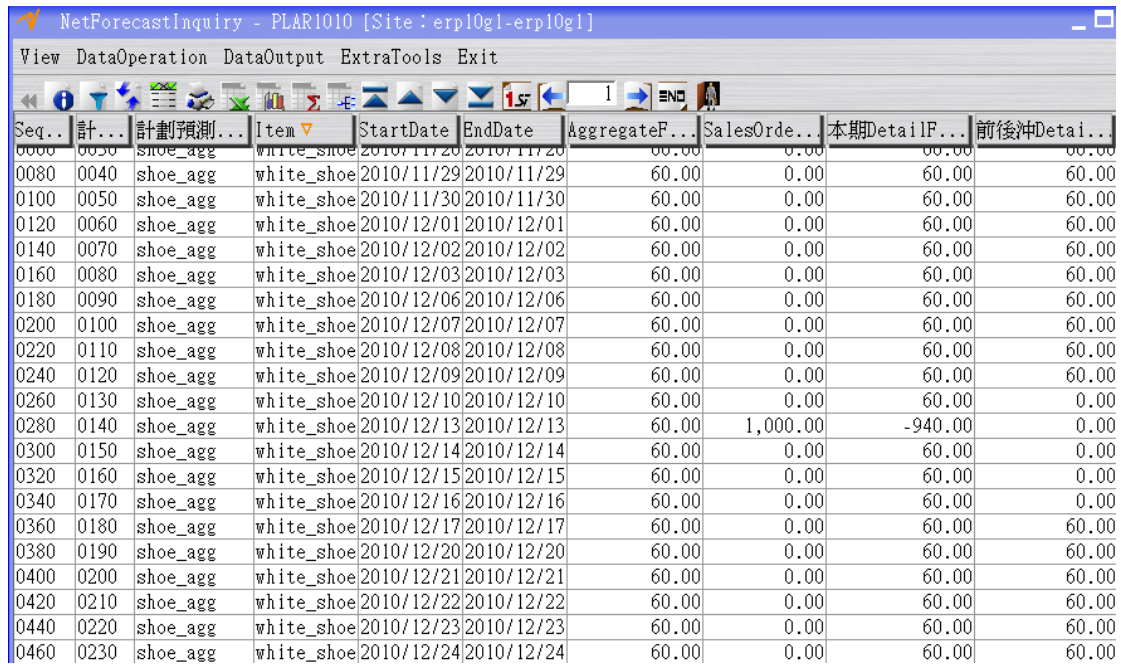
Click DetailForecastNettingExecution button to cancel the sales order quantities from forecast quantities. After that, we can click NetForecastInquiry to check the netted forecast quantities.

NetForecastInquiry - PLAR1010 [Site: erp10g1-erp10g1]

View DataOperation DataOutput ExtraTools Exit

Seq..	計...	計劃預測...	Item	StartDate	EndDate	AggregateF...	SalesOrde...	本期DetailF...	前後沖Detail...
0010	0010	shoe_agg	black_shoe	2010/11/24	2010/11/24	140.00	0.00	140.00	140.00
0030	0020	shoe_agg	black_shoe	2010/11/25	2010/11/25	140.00	0.00	140.00	140.00
0050	0030	shoe_agg	black_shoe	2010/11/26	2010/11/26	140.00	0.00	140.00	140.00
0070	0040	shoe_agg	black_shoe	2010/11/29	2010/11/29	140.00	0.00	140.00	140.00
0090	0050	shoe_agg	black_shoe	2010/11/30	2010/11/30	140.00	0.00	140.00	140.00
0110	0060	shoe_agg	black_shoe	2010/12/01	2010/12/01	140.00	0.00	140.00	140.00
0130	0070	shoe_agg	black_shoe	2010/12/02	2010/12/02	140.00	0.00	140.00	140.00
0150	0080	shoe_agg	black_shoe	2010/12/03	2010/12/03	140.00	0.00	140.00	140.00
0170	0090	shoe_agg	black_shoe	2010/12/06	2010/12/06	140.00	0.00	140.00	140.00
0190	0100	shoe_agg	black_shoe	2010/12/07	2010/12/07	140.00	0.00	140.00	140.00
0210	0110	shoe_agg	black_shoe	2010/12/08	2010/12/08	140.00	0.00	140.00	140.00
0230	0120	shoe_agg	black_shoe	2010/12/09	2010/12/09	140.00	0.00	140.00	140.00
0250	0130	shoe_agg	black_shoe	2010/12/10	2010/12/10	140.00	0.00	140.00	0.00
0270	0140	shoe_agg	black_shoe	2010/12/13	2010/12/13	140.00	1,000.00	-860.00	0.00
0290	0150	shoe_agg	black_shoe	2010/12/14	2010/12/14	140.00	0.00	140.00	0.00
0310	0160	shoe_agg	black_shoe	2010/12/15	2010/12/15	140.00	0.00	140.00	0.00
0330	0170	shoe_agg	black_shoe	2010/12/16	2010/12/16	140.00	0.00	140.00	0.00
0350	0180	shoe_agg	black_shoe	2010/12/17	2010/12/17	140.00	0.00	140.00	140.00
0370	0190	shoe_agg	black_shoe	2010/12/20	2010/12/20	140.00	0.00	140.00	140.00
0390	0200	shoe_agg	black_shoe	2010/12/21	2010/12/21	140.00	0.00	140.00	140.00

## Material Requirement Planning on a Cloud SOA-ERP System

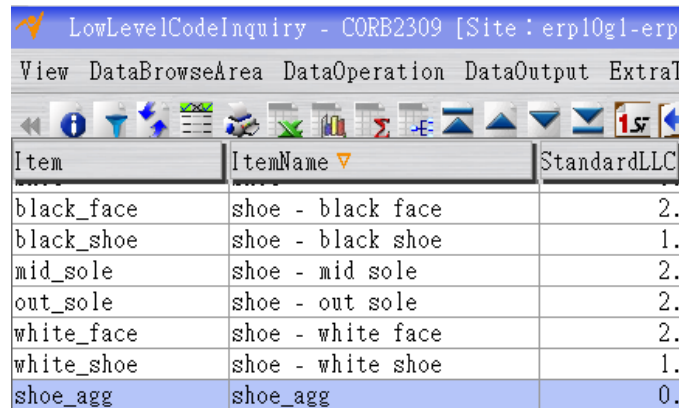


Seq..	計...	計劃預測...	Item	StartDate	EndDate	AggregateF...	SalesOrde...	本期DetailF...	前後沖Detai...
0000	0030	shoe_agg	white_shoe	2010/11/20	2010/11/20	60.00	0.00	60.00	60.00
0080	0040	shoe_agg	white_shoe	2010/11/29	2010/11/29	60.00	0.00	60.00	60.00
0100	0050	shoe_agg	white_shoe	2010/11/30	2010/11/30	60.00	0.00	60.00	60.00
0120	0060	shoe_agg	white_shoe	2010/12/01	2010/12/01	60.00	0.00	60.00	60.00
0140	0070	shoe_agg	white_shoe	2010/12/02	2010/12/02	60.00	0.00	60.00	60.00
0160	0080	shoe_agg	white_shoe	2010/12/03	2010/12/03	60.00	0.00	60.00	60.00
0180	0090	shoe_agg	white_shoe	2010/12/06	2010/12/06	60.00	0.00	60.00	60.00
0200	0100	shoe_agg	white_shoe	2010/12/07	2010/12/07	60.00	0.00	60.00	60.00
0220	0110	shoe_agg	white_shoe	2010/12/08	2010/12/08	60.00	0.00	60.00	60.00
0240	0120	shoe_agg	white_shoe	2010/12/09	2010/12/09	60.00	0.00	60.00	60.00
0260	0130	shoe_agg	white_shoe	2010/12/10	2010/12/10	60.00	0.00	60.00	0.00
0280	0140	shoe_agg	white_shoe	2010/12/13	2010/12/13	60.00	1,000.00	-940.00	0.00
0300	0150	shoe_agg	white_shoe	2010/12/14	2010/12/14	60.00	0.00	60.00	0.00
0320	0160	shoe_agg	white_shoe	2010/12/15	2010/12/15	60.00	0.00	60.00	0.00
0340	0170	shoe_agg	white_shoe	2010/12/16	2010/12/16	60.00	0.00	60.00	0.00
0360	0180	shoe_agg	white_shoe	2010/12/17	2010/12/17	60.00	0.00	60.00	60.00
0380	0190	shoe_agg	white_shoe	2010/12/20	2010/12/20	60.00	0.00	60.00	60.00
0400	0200	shoe_agg	white_shoe	2010/12/21	2010/12/21	60.00	0.00	60.00	60.00
0420	0210	shoe_agg	white_shoe	2010/12/22	2010/12/22	60.00	0.00	60.00	60.00
0440	0220	shoe_agg	white_shoe	2010/12/23	2010/12/23	60.00	0.00	60.00	60.00
0460	0230	shoe_agg	white_shoe	2010/12/24	2010/12/24	60.00	0.00	60.00	60.00

From the above tables, we can see the effect of forward netting period (1) and backward netting period (3) defined in Forecast Type of NEO SOA-ERP system.

### ● Low Level Code Calculation

Low level code controls the sequence of MPS/MRP calculation. It is advised that low level codes are updated before executing MPS/MRP. Low level code calculation can be found in the Core, Product, BOM of NEO SOA-ERP's menu. Execute LowLevelCodeCalculation, and use LowLevelCodeInquiry to check the low level codes:



Item	ItemName	StandardLLC
black_face	shoe - black face	2.
black_shoe	shoe - black shoe	1.
mid_sole	shoe - mid sole	2.
out_sole	shoe - out sole	2.
white_face	shoe - white face	2.
white_shoe	shoe - white shoe	1.
shoe_agg	shoe_agg	0.

### ● Planning Execution

Users can create multiple versions of MPS/MRP in NEO SOA-ERP by defining planning executions. Each planning execution creates a version of MPS/MRP. In the Basic Data tab, we specify a shop calendar and a supply-demand type. The supply-demand type includes several forest types. When MPS or MRP is executed, all the forecast data of the forecast types in the specified supply-demand type are considered.

Site	PlanningExecutionID	PlanningShopCalendar	SupplyDemandType
erp10g1	shoel	erp10g1	erp10g1

BasicData	ItemAttributeData	ExecutionTimeData	DocumentGenerationData
<input type="checkbox"/> IsToSpecifyBOM <input type="checkbox"/> IsToSelfIndicateRouting <input type="checkbox"/> IsToSpecifyIsPlannedOrderItem <input type="checkbox"/> IsToSpecifySmallestOrderQuantity <input type="checkbox"/> IsToSpecifyLargestOrderQuantity <input type="checkbox"/> IsToSpecifyOrderQuantityMultiple <input type="checkbox"/> IsToSpecifyLeadTime <input type="checkbox"/> IsToSpecifySafetyTime <input type="checkbox"/> IsToSpecifySafetyStock			<input type="checkbox"/> PlannedOrderItemStatus <input type="checkbox"/> Inactive <input type="checkbox"/> DESIGN <input type="checkbox"/> PRODUCTION <input checked="" type="checkbox"/> ACTIVE <input type="checkbox"/> Discard

### ● *MPS Execution*

Simply click MPS button on the PlanExecution user interface, NEO SOA-ERP starts to execute the MPS procedure. When it is completed, use PlanningResultInquiryByItem to check the results of MPS as the followings:

## Material Requirement Planning on a Cloud SOA-ERP System

PlanExecutionInquiryByItem - PLAR1030 [Site:erp10g1-erp10g1] [PlanningE...]

View DataOperation DataOutput ExtraTools Exit

Item	StandardLLC	IsInventoryControlItem	IsPhantomItem	IsForecastItem	IsMPSItem
black_shoe	1.Y		N	Y	Y
shoe_agg	0.N		Y	N	Y
white_shoe	1.Y		N	Y	Y

PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry

SupplyDocumentType	SupplyQuantity	UnallocatedQty	AllocationDueDate	OperationDate	Operat
現有庫存	380.00000000	0.00000000	2010/12/07	2010/12/07	erp10.

DemandSch...	DemandDocumentType	DemandNo	DemandDocumentSeq...	DemandQty	Allocation
2010/12/07	ForecastSheet	PF1011000005	0190	140.00	140.00
2010/12/08	ForecastSheet	PF1011000005	0210	140.00	140.00
2010/12/09	ForecastSheet	PF1011000005	0230	140.00	100.00
2010/12/13	SalesOrder	SO1012000020	0010	1,000.00	0.00
2010/12/17	ForecastSheet	PF1011000005	0350	140.00	0.00
2010/12/20	ForecastSheet	PF1011000005	0370	140.00	0.00
2010/12/21	ForecastSheet	PF1011000005	0390	140.00	0.00
2010/12/22	ForecastSheet	PF1011000005	0410	140.00	0.00

PlanExecutionInquiryByItem - PLAR1030 [Site:erp10g1-erp10g1] [PlanningExecution:shoe1-shoe1]

View DataOperation DataOutput ExtraTools Exit

Item	MPS/WRP	StandardLLC	IsInventoryControlItem	IsPhantomItem	IsComponentItemStructureDocument	IsPro
black_shoe	MPS	1.Y		N	N	N
white_shoe	MPS	1.Y		N	N	N

PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrd...

毛需求日期	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2010/12/07	140.00000000	0.00000000	240.00000000	0.00000000	240.00000000
2010/12/08	140.00000000	0.00000000	100.00000000	0.00000000	100.00000000
2010/12/09	140.00000000	0.00000000	-40.00000000	1,180.00000000	1,140.00000000
2010/12/13	1,000.00000000	0.00000000	140.00000000	0.00000000	140.00000000
2010/12/17	140.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2010/12/20	140.00000000	0.00000000	-140.00000000	700.00000000	560.00000000
2010/12/21	140.00000000	0.00000000	420.00000000	0.00000000	420.00000000
2010/12/22	140.00000000	0.00000000	280.00000000	0.00000000	280.00000000
2010/12/23	140.00000000	0.00000000	140.00000000	0.00000000	140.00000000
2010/12/24	140.00000000	0.00000000	0.00000000	0.00000000	0.00000000

PlanExecutionInquiryByItem - PLAR1030 [Site:erp10g1-erp10g1] [PlanningExecution:shoe1-shoe1]

View DataOperation DataOutput ExtraTools Exit

Item	MPS/WRP	StandardLLC	IsInventoryControlItem	IsPhantomItem	IsComponentItemStructureDocument	IsF
black_shoe	MPS	1.Y		N	N	N
white_shoe	MPS	1.Y		N	N	N

ata SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrderInquiry

PlannedOrderNo	PlanningSourceType	PlannedQuantity	InventoryUM	ReleaseDate	ReceiptDate	IsFirmPlannedOrder
00000031	Manufacture	1,180.00000000	ea	2010/12/09	2010/12/09	N
00000032	Manufacture	700.00000000	ea	2010/12/20	2010/12/20	N

## Material Requirement Planning on a Cloud SOA-ERP System

PlanExecutionInquiryByItem - PLAR1030 [Site : erp10g1-erp10g1] [PlanningE...]

View DataOperation DataOutput ExtraTools Exit

Item	StandardLLC	IsInventoryControlItem	IsPhantomItem	IsForecastItem	IsMPSItem
black_shoe	1.Y		N	Y	Y
shoe_agg	0.N		Y	N	Y
white_shoe	1.Y		N	Y	Y

PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry

SupplyDocumentType	SupplyQuantity	UnallocatedQty	AllocationDueDate	OperationDate	Operat
現有庫存	10.00000000	0.00000000	2010/12/07	2010/12/07	erp10.

DemandSch...	DemandDocumentType	DemandNo	DemandDocumentSeq...	DemandQty	Allocation
2010/12/07	ForecastSheet	PF1011000005	0200	60.00	10.00
2010/12/08	ForecastSheet	PF1011000005	0220	60.00	0.00
2010/12/09	ForecastSheet	PF1011000005	0240	60.00	0.00
2010/12/13	SalesOrder	SO1012000020	0020	1,000.00	0.00
2010/12/17	ForecastSheet	PF1011000005	0360	60.00	0.00
2010/12/20	ForecastSheet	PF1011000005	0380	60.00	0.00
2010/12/21	ForecastSheet	PF1011000005	0400	60.00	0.00
2010/12/22	ForecastSheet	PF1011000005	0420	60.00	0.00

PlanExecutionInquiryByItem - PLAR1030 [Site : erp10g1-erp10g1] [PlanningExecution:shoe1-shoe1]

View DataOperation DataOutput ExtraTools Exit

Item	MPS/MRP	StandardLLC	IsInventoryControlItem	IsPhantomItem	IsComponentItemStructureDocument	IsPro
black_shoe	MPS	1.Y		N	N	N
white_shoe	MPS	1.Y		N	N	N

ata SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrderInquiry

毛需求日期	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2010/12/07	60.00000000	0.00000000	-50.00000000	1,170.00000000	1,120.00000000
2010/12/08	60.00000000	0.00000000	1,060.00000000	0.00000000	1,060.00000000
2010/12/09	60.00000000	0.00000000	1,000.00000000	0.00000000	1,000.00000000
2010/12/13	1,000.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2010/12/17	60.00000000	0.00000000	-60.00000000	360.00000000	300.00000000
2010/12/20	60.00000000	0.00000000	240.00000000	0.00000000	240.00000000
2010/12/21	60.00000000	0.00000000	180.00000000	0.00000000	180.00000000
2010/12/22	60.00000000	0.00000000	120.00000000	0.00000000	120.00000000
2010/12/23	60.00000000	0.00000000	60.00000000	0.00000000	60.00000000
2010/12/24	60.00000000	0.00000000	0.00000000	0.00000000	0.00000000

PlanExecutionInquiryByItem - PLAR1030 [Site : erp10g1-erp10g1] [PlanningExecution:shoe1-shoe1]

View DataOperation DataOutput ExtraTools Exit

Item	MPS/MRP	StandardLLC	IsInventoryControlItem	IsPhantomItem	IsComponentItemStructureDocument	IsFirmPlannedOrder
black_shoe	MPS	1.Y		N	N	N
white_shoe	MPS	1.Y		N	N	N

ata SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrderInquiry

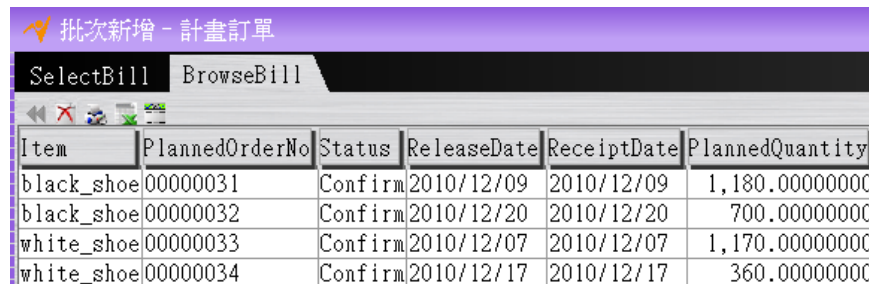
PlannedOrderNo	PlanningSourceType	PlannedQuantity	InventoryUM	ReleaseDate	ReceiptDate	IsFirmPlannedOrder
00000033	Manufacture	1,170.00000000	ea	2010/12/07	2010/12/07	N
00000034	Manufacture	360.00000000	ea	2010/12/17	2010/12/17	N



In the PlannedOrderInquiry tab, we know that there are 4 planned orders: 1180 black shoes completed on 2010/12/09, 700 black shoes completed on 2010/12/20, 1170 white shoes completed on 2010/12/07, and 360 white shoes completed on 2010/12/17.

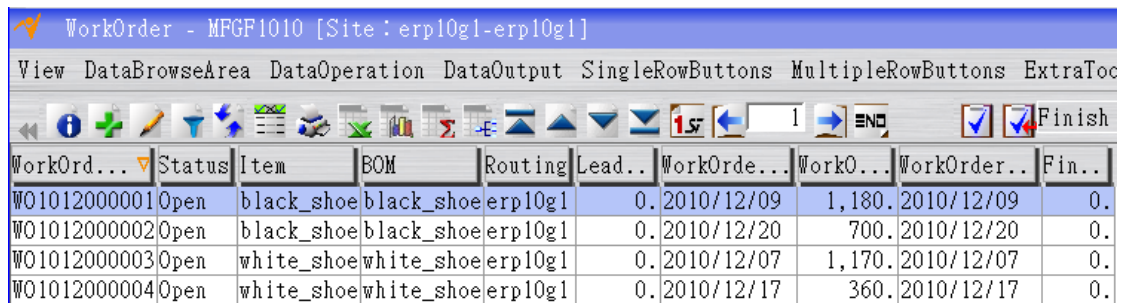
- *Create work orders for finished goods*

In WorkOrder program of NEO SOA-ERP system, click ChooseBatchAddSource and then select PlannedOrder, then click Browse as the following:



Item	PlannedOrderNo	Status	ReleaseDate	ReceiptDate	PlannedQuantity
black_shoe	00000031	Confirm	2010/12/09	2010/12/09	1,180.00000000
black_shoe	00000032	Confirm	2010/12/20	2010/12/20	700.00000000
white_shoe	00000033	Confirm	2010/12/07	2010/12/07	1,170.00000000
white_shoe	00000034	Confirm	2010/12/17	2010/12/17	360.00000000

Then click OK to obtain 4 open status work orders:



WorkOrd...	Status	Item	BOM	Routing	Lead..	WorkOrde...	WorkO...	WorkOrder...	Fin..
W01012000001	Open	black_shoe	black_shoe	erp10gl	0.	2010/12/09	1,180.	2010/12/09	0.
W01012000002	Open	black_shoe	black_shoe	erp10gl	0.	2010/12/20	700.	2010/12/20	0.
W01012000003	Open	white_shoe	white_shoe	erp10gl	0.	2010/12/07	1,170.	2010/12/07	0.
W01012000004	Open	white_shoe	white_shoe	erp10gl	0.	2010/12/17	360.	2010/12/17	0.

- *MRP Execution*

Simply click MRP button on the PlanExecution user interface, NEO SOA-ERP starts to execute the MRP procedure for the opened finished goods work orders. When it is completed, use PlanningResultInquiryByItem to check the MRP results as the followings:

- black face



## Material Requirement Planning on a Cloud SOA-ERP System

PlanExecutionInquiryByItem - PLAR1030 [Site : erp10g1-erp10g1] [PlanningExecution:shoe1-]

View DataBrowseArea DataOperation DataOutput ExtraTools Exit

Item	MPS/MRP	StandardLLC	BOMName	Routing	IsForecastItem	LotSizingRule	OrderInterval	LeadTime
black_face	MRP	2.			N	POQ	7.00000000	0.000...
mid_sole	MRP	2.			N	POQ	7.00000000	0.000...

BasicData PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry

SupplyDocumentType	SupplyDocumentNo	SupplyDocumentDetailSeqNo	SupplyQuantity	UnallocatedQty	AllocationDueDate
現有庫存			340.00000000	0.00000000	2010/12/09

DemandScheduledDeliveryDate	DemandDocumentType	DemandNo	Dema...	DemandQty	Allocation	OperationDate	Opera
2010/12/09	WorkOrder	WO1012000001	0010	1,180.	340.	2010/12/11	erp10
2010/12/20	WorkOrder	WO1012000002	0010	700.	0.	2010/12/11	erp10

BasicData PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry

毛需求日期	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2010/12/09	1,180.00000000	0.00000000	-840.00000000	840.00000000	0.00000000
2010/12/20	700.00000000	0.00000000	-700.00000000	700.00000000	0.00000000

SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrderInquiry

PlannedOrderNo	PlanningSourceType	PlannedQuantity	InventoryUM	ReleaseDate	ReceiptDate	IsFirmPlannedC
00000035	Purchase	840.00000000	ea	2010/12/09	2010/12/09	N
00000036	Purchase	700.00000000	ea	2010/12/20	2010/12/20	N

### ■ white face

PlanExecutionInquiryByItem - PLAR1030 [Site : erp10g1-erp10g1] [PlanningExecution:shoe1-]

View DataBrowseArea DataOperation DataOutput ExtraTools Exit

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## Material Requirement Planning on a Cloud SOA-ERP System

SupplyDemandAllocationInquiry							ActionMessageInquiry	TimePhaseDataInquiry	PlannedOrderInquiry
PlannedOrderNo	PlanningSourceType	PlannedQuantity	InventoryUM	ReleaseDate	ReceiptDate	IsFirmPlannedC			
00000041	Purchase	930.00000000	ea	2010/12/07	2010/12/07	N			
00000042	Purchase	360.00000000	ea	2010/12/17	2010/12/17	N			

### ■ mid sole

PlanExecutionInquiryByItem - PLAR1030 [Site: erp10gl-erp10gl] [PlanningExecution:shoe1-]									
View DataBrowseArea DataOperation DataOutput ExtraTools Exit									
Item	MPS/MRP	StandardLLC	BOMName	Routing	IsForecastItem	LotSizingRule	OrderInterval	LeadTime	
mid_sole	MRP	2.			N	POQ	7.00000000	0.000...	
out_sole	MRP	2.			N	POQ	7.00000000	0.000...	

SupplyDemandAllocationInquiry							ActionMessageInquiry	TimePhaseDataInquiry	PlannedOrderInquiry
SupplyDocumentType	SupplyDocumentNo	SupplyDocumentDetailSeqNo	SupplyQuantity	UnallocatedQty	AllocationDueDa				
現有庫存			670.00000000	0.00000000	2010/12/07				

DemandScheduledDeliveryDate	DemandDocumentType	DemandNo	Dema...	DemandQty	Allocation	OperationDate	Operat
2010/12/07	WorkOrder	WO1012000003	0020	1,170.	670.	2010/12/11	erp10g
2010/12/09	WorkOrder	WO1012000001	0020	1,180.	0.	2010/12/11	erp10g
2010/12/17	WorkOrder	WO1012000004	0020	360.	0.	2010/12/11	erp10g
2010/12/20	WorkOrder	WO1012000002	0020	700.	0.	2010/12/11	erp10g

SupplyDemandAllocationInquiry							ActionMessageInquiry	TimePhaseDataInquiry	PlannedOrderInquiry
毛需求日期	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance				
2010/12/07	1,170.00000000	0.00000000	-500.00000000	1,680.00000000	1,180.00000000				
2010/12/09	1,180.00000000	0.00000000	0.00000000	0.00000000	0.00000000				
2010/12/17	360.00000000	0.00000000	-360.00000000	1,060.00000000	700.00000000				
2010/12/20	700.00000000	0.00000000	0.00000000	0.00000000	0.00000000				

SupplyDemandAllocationInquiry							ActionMessageInquiry	TimePhaseDataInquiry	PlannedOrderInquiry
PlannedOrderNo	PlanningSourceType	PlannedQuantity	InventoryUM	ReleaseDate	ReceiptDate	IsFirmPlannedC			
00000037	Purchase	1,680.00000000	ea	2010/12/07	2010/12/07	N			
00000038	Purchase	1,060.00000000	ea	2010/12/17	2010/12/17	N			

### ■ out sole

## Material Requirement Planning on a Cloud SOA-ERP System

PlanExecutionInquiryByItem - PLAR1030 [Site : erp10g1-erp10g1] [PlanningExecution:shoe1-]

View DataBrowseArea DataOperation DataOutput ExtraTools Exit

Item	MPS/MRP	StandardLLC	BOMName	Routing	IsForecastItem	LotSizingRule	OrderInterval	LeadTime
mid_ole	MRP	2.			N	POQ	7.00000000	0.000...
out_ole	MRP	2.			N	POQ	7.00000000	0.000...

SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrderInquiry

SupplyDocumentType	SupplyDocumentNo	SupplyDocumentDetailSeqNo	SupplyQuantity	UnallocatedQty	AllocationDueDa
現有庫存			540.00000000	0.00000000	2010/12/07

DemandScheduledDeliveryDate	DemandDocumentType	DemandNo	Dema...	DemandQty	Allocation	OperationDate	Operat
2010/12/07	WorkOrder	WO1012000003	0030	1,170.	540.	2010/12/11	erp10g
2010/12/09	WorkOrder	WO1012000001	0030	1,180.	0.	2010/12/11	erp10g
2010/12/17	WorkOrder	WO1012000004	0030	360.	0.	2010/12/11	erp10g
2010/12/20	WorkOrder	WO1012000002	0030	700.	0.	2010/12/11	erp10g

PlanExecutionInquiryByItem - PLAR1030 [Site : erp10g1-erp10g1] [PlanningExecution:shoe1-]

View DataBrowseArea DataOperation DataOutput ExtraTools Exit

Item	MPS/MRP	StandardLLC	BOMName	Routing	IsForecastItem	LotSizingRule	OrderInterval	LeadTime
mid_ole	MRP	2.			N	POQ	7.00000000	0.000...
out_ole	MRP	2.			N	POQ	7.00000000	0.000...

SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrderInquiry

毛需求日期	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2010/12/07	1,170.00000000	0.00000000	-630.00000000	1,810.00000000	1,180.00000000
2010/12/09	1,180.00000000	0.00000000	0.00000000	0.00000000	0.00000000
2010/12/17	360.00000000	0.00000000	-360.00000000	1,060.00000000	700.00000000
2010/12/20	700.00000000	0.00000000	0.00000000	0.00000000	0.00000000

SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrderInquiry

PlannedOrderNo	PlanningSourceType	PlannedQuantity	InventoryUM	ReleaseDate	ReceiptDate	IsFirmPlannedC
00000039	Purchase	1,810.00000000	ea	2010/12/07	2010/12/07	N
00000040	Purchase	1,060.00000000	ea	2010/12/17	2010/12/17	N

- Create purchase requisitions for the purchased items

Click ChooseBatchAddSource and select PlannedOrder, then click Browse.

BatchAdd-PurchaseRequisition

SelectBill BrowseBill

Site	PlanningExecution	Item	Status	ReleaseDate	Receip...
erp10gl	shoel	mid_sole	Confirm	2010/12/07	2010/12/07
erp10gl	shoel	out_sole	Confirm	2010/12/07	2010/12/07
erp10gl	shoel	white_face	Confirm	2010/12/07	2010/12/07
erp10gl	shoel	black_face	Confirm	2010/12/09	2010/12/09
erp10gl	shoel	mid_sole	Confirm	2010/12/17	2010/12/17
erp10gl	shoel	out_sole	Confirm	2010/12/17	2010/12/17
erp10gl	shoel	white_face	Confirm	2010/12/17	2010/12/17
erp10gl	shoel	black_face	Confirm	2010/12/20	2010/12/20

Choose the first 4 near planned orders by deleting the other planned orders and click OK to automatically create a purchase requisition with 4 items.

PurchaseRequisition - PURF1010 [Site : erp10gl-erp10gl]

View DataBrowseArea DataOperation DataOutput MultipleRowButtons ExtraTools Exit

Site	PurchaseRequisitionNo	Status	請購日期	PurchaseRequisitionDepartment	PurchaseType
erp10gl	PR1012000001	Open	2010/12/11	erp10gl	normal

BasicData RemarkData PurchaseRequisitionData

Seq...	Status	SourceType	ItemID	PurchaseRequ...	Schedule...	PaymentSite	ReceiptWarehouse
0030	Open	PlannedOrder	mid_sole	1,680.00000000	2010/12/07	erp10gl	erp10gl
0050	Open	PlannedOrder	out_sole	1,810.00000000	2010/12/07	erp10gl	erp10gl
0070	Open	PlannedOrder	white_face	930.00000000	2010/12/07	erp10gl	erp10gl
0010	Open	PlannedOrder	black_face	840.00000000	2010/12/09	erp10gl	erp10gl

## Impacts of Safety Stock, Safety Time, Yield Rate, and Scrap Rate

- Check the Initial States before Planning

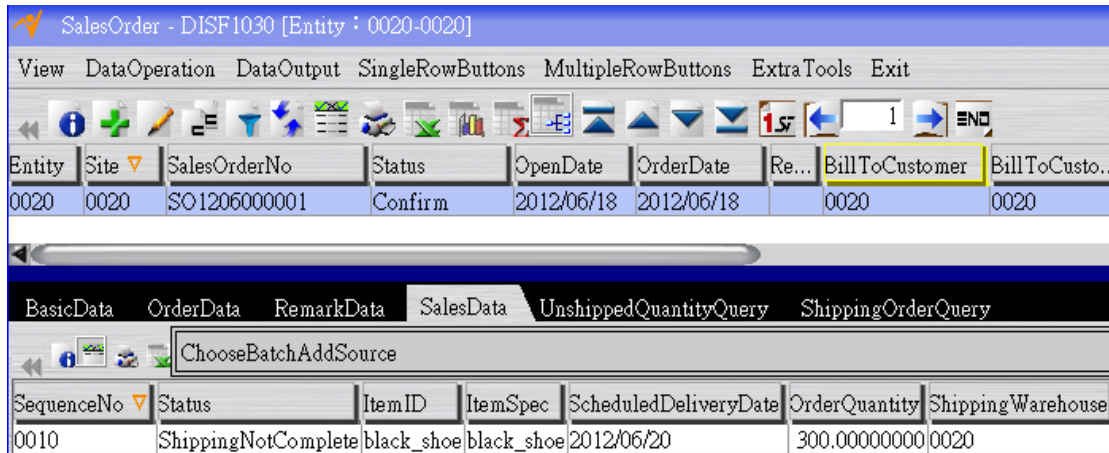
For the supply side, there is no scheduled receipts, and the on-hand inventory is as the followings:

現有庫存查詢 - CORB6203

View DataOperation DataOutput SingleRowButtons ExtraTools Exit

EarliestTransactionDate	LatestTransactionDate	Item	WarehouseName	InventoryQuantity	ReserveQuantity	AvailableQuantity
2011/01/01	2012/06/18	black_face	0020	50.00000000	0.00000000	50.00000000
2011/01/01	2011/01/01	black_shoe	0020	100.00000000	0.00000000	100.00000000
2011/01/01	2011/01/01	mid_sole	0020	2,000.00000000	0.00000000	2,000.00000000
2011/01/01	2011/01/01	out_sole	0020	2,000.00000000	0.00000000	2,000.00000000
2011/01/01	2011/01/01	white_face	0020	1,000.00000000	0.00000000	1,000.00000000
2011/01/01	2011/01/01	white_shoe	0020	200.00000000	0.00000000	200.00000000

As for the demand side, in addition to forecast, the only demand is a sales order:



Entity	Site	SalesOrderNo	Status	OpenDate	OrderDate	Re...	BillToCustomer	BillToCusto...
0020	0020	SO1206000001	Confirm	2012/06/18	2012/06/18	0020	0020	0020

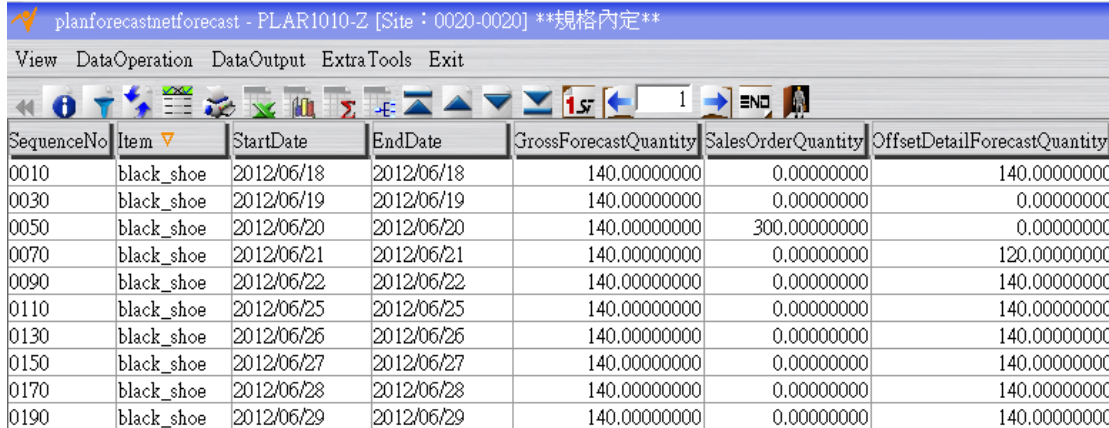
  

SequenceNo	Status	ItemID	ItemSpec	ScheduledDeliveryDate	OrderQuantity	ShippingWarehouse
0010	ShippingNotComplete	black_shoe	black_shoe	2012/06/20	300.00000000	0020

The on-hand inventory of black shoe is 100 and the sales order quantity is 300.

- *Netting the sales order quantity from forecast*

Netting the sales order quantity from forecast, and the Net Forecast Inquiry result is:



SequenceNo	Item	StartDate	EndDate	GrossForecastQuantity	SalesOrderQuantity	OffsetDetailForecastQuantity
0010	black_shoe	2012/06/18	2012/06/18	140.00000000	0.00000000	140.00000000
0030	black_shoe	2012/06/19	2012/06/19	140.00000000	0.00000000	0.00000000
0050	black_shoe	2012/06/20	2012/06/20	140.00000000	300.00000000	0.00000000
0070	black_shoe	2012/06/21	2012/06/21	140.00000000	0.00000000	120.00000000
0090	black_shoe	2012/06/22	2012/06/22	140.00000000	0.00000000	140.00000000
0110	black_shoe	2012/06/25	2012/06/25	140.00000000	0.00000000	140.00000000
0130	black_shoe	2012/06/26	2012/06/26	140.00000000	0.00000000	140.00000000
0150	black_shoe	2012/06/27	2012/06/27	140.00000000	0.00000000	140.00000000
0170	black_shoe	2012/06/28	2012/06/28	140.00000000	0.00000000	140.00000000
0190	black_shoe	2012/06/29	2012/06/29	140.00000000	0.00000000	140.00000000

- *Execute MPS for black shoe*

The planning data of black shoe is:



## Material Requirement Planning on a Cloud SOA-ERP System

計劃執行計劃件號查詢 - PLAR1020 [Site : 0020-0020] [PlanningExecution:0020-]

View DataOperation DataOutput ExtraTools Exit

ItemName MPS/ MRP StandardLLC IsInventoryControlItem IsPhantomItem IsComponentItemStructureDocument IsProjectContr

bla... black\_shoe MPS 1. Y N N N N

pi... mid... MRP 2. Y N N N N

BasicData PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedOrder

BOM black\_shoe black\_shoe

ECVersion 0

EngineeringChangeDate 9999/12/31

Routing 0020 0020

YieldRate 100.00 %

RequirementPlanning

LotSizingRule F0Q

OrderInterval 1

FixedOrderQuantity 60

SmallestOrderQuantity 0

LargestOrderQuantity 0

OrderQuantityMultiple 60

LeadTime 0

SafetyTime 0

SafetyStock 0

The result of MPS execution is:

GrossRequirement..	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2012/06/18	140.00000000	0.00000000	-40.00000000	60.00000000	20.00000000
2012/06/20	300.00000000	0.00000000	-280.00000000	300.00000000	20.00000000
2012/06/21	120.00000000	0.00000000	-100.00000000	120.00000000	20.00000000
2012/06/22	140.00000000	0.00000000	-120.00000000	120.00000000	0.00000000
2012/06/25	140.00000000	0.00000000	-140.00000000	180.00000000	40.00000000
2012/06/26	140.00000000	0.00000000	-100.00000000	120.00000000	20.00000000
2012/06/27	140.00000000	0.00000000	-120.00000000	120.00000000	0.00000000
2012/06/28	140.00000000	0.00000000	-140.00000000	180.00000000	40.00000000
2012/06/29	140.00000000	0.00000000	-100.00000000	120.00000000	20.00000000

### ● Impact of Safety Time

When safety time is 1, the MPS result is as the followings:



BasicData PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry Plann					
GrossRequirement..	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2012/06/15	0.00000000	0.00000000	100.00000000	60.00000000	160.00000000
2012/06/18	140.00000000	0.00000000	20.00000000	0.00000000	20.00000000
2012/06/19	0.00000000	0.00000000	20.00000000	300.00000000	320.00000000
2012/06/20	300.00000000	0.00000000	20.00000000	120.00000000	140.00000000
2012/06/21	120.00000000	0.00000000	20.00000000	120.00000000	140.00000000
2012/06/22	140.00000000	0.00000000	0.00000000	180.00000000	180.00000000
2012/06/25	140.00000000	0.00000000	40.00000000	120.00000000	160.00000000
2012/06/26	140.00000000	0.00000000	20.00000000	120.00000000	140.00000000
2012/06/27	140.00000000	0.00000000	0.00000000	180.00000000	180.00000000
2012/06/28	140.00000000	0.00000000	40.00000000	120.00000000	160.00000000
2012/06/29	140.00000000	0.00000000	20.00000000	0.00000000	20.00000000

When  $POH = PAB(-1) + SR - GR$  is calculated, PORC is determined and moved 1 period ahead, and then  $PAB(-1)$  and  $POH$  is recalculated. The -1 means one period (day) before current period. For example, the original  $PORC(6/15) = 0$ , and  $PAB(6/15) = 100$ ,  $POH(6/18) = -40$ ,  $NR(6/18) = 40$ ,  $PORC(6/18) = 60$  for the lot sizing rule is  $FOQ=60$ . Since  $ST = 1$ ,  $PORC(6/18)$  is moved one period ahead. Therefore,  $PORC(6/15) = 60$  and  $PAB(6/15) = 160$ . Then  $POH(6/18) = 20$ ,  $PORC(6/18) = 0$  and  $PAB(6/18) = 20$ .

#### ● Impact of Yield Rate

Suppose the yield rate of black shoe is changed from 100% to 90%. The safety time is reset to 0. The result of MPS is:

BasicData PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry Plann					
GrossRequirement..	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2012/06/18	140.00000000	0.00000000	-40.00000000	60.00000000	20.00000000
2012/06/20	300.00000000	0.00000000	-280.00000000	360.00000000	80.00000000
2012/06/21	120.00000000	0.00000000	-40.00000000	60.00000000	20.00000000
2012/06/22	140.00000000	0.00000000	-120.00000000	180.00000000	60.00000000
2012/06/25	140.00000000	0.00000000	-80.00000000	120.00000000	40.00000000
2012/06/26	140.00000000	0.00000000	-100.00000000	120.00000000	20.00000000
2012/06/27	140.00000000	0.00000000	-120.00000000	180.00000000	60.00000000
2012/06/28	140.00000000	0.00000000	-80.00000000	120.00000000	40.00000000
2012/06/29	140.00000000	0.00000000	-100.00000000	120.00000000	20.00000000

MPS starts from the first period.  $POH(6/18) = -40$ ,  $NR(6/18) = 40$ ,  $PORC(6/18) = 40/0.9 = 44$ . Since the lot sizing rule is  $FOQ=60$ ,  $PORC(6/18) = 60$ , and  $PAB(6/18) = 20$ . For the second period, 6/19, there is neither demand nor supply. For the third period,  $POH(6/20) = -280$ ,  $NR(6/20) = 280$ , since the yield rate = 90%,  $PORC(6/20) = 280/0.9 = 311$ , but the lot sizing rule is  $FOQ=60$ , so the  $PORC(6/20) = 360$  and  $PAB(360) = 80$ .

- *Impact of Safety Stock and Yield Rate*

We now reset the yield rate back to 100% and set the safety stock to 20. The MPS result is:

BasicData	PlanningData	SupplyDemandAllocationInquiry	ActionMessageInquiry	TimePhaseDataInquiry	PlannedC
GrossRequirementDate	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2012/06/18	140.00000000	0.00000000	-40.00000000	60.00000000	20.00000000
2012/06/20	300.00000000	0.00000000	-280.00000000	300.00000000	20.00000000
2012/06/21	120.00000000	0.00000000	-100.00000000	120.00000000	20.00000000
2012/06/22	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/25	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/26	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/27	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/28	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/29	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000

We can see the impact of safety stock on MRP is that no PAB is less than 20. In the previous run, because of the FOQ=60 lot sizing rule, the impact of the yield rate on MPS/MRP result is not clear. Now we change lot sizing rule to LFT (lot for lot) and set the yield rate to 90%. The MPS result becomes:

BasicData	PlanningData	SupplyDemandAllocationInquiry	ActionMessageInquiry	TimePhaseDataInquiry	PlannedC
GrossRequirementDate	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2012/06/18	140.00000000	0.00000000	-40.00000000	67.00000000	27.00000000
2012/06/20	300.00000000	0.00000000	-273.00000000	326.00000000	53.00000000
2012/06/21	120.00000000	0.00000000	-67.00000000	97.00000000	30.00000000
2012/06/22	140.00000000	0.00000000	-110.00000000	144.00000000	34.00000000
2012/06/25	140.00000000	0.00000000	-106.00000000	140.00000000	34.00000000
2012/06/26	140.00000000	0.00000000	-106.00000000	140.00000000	34.00000000
2012/06/27	140.00000000	0.00000000	-106.00000000	140.00000000	34.00000000
2012/06/28	140.00000000	0.00000000	-106.00000000	140.00000000	34.00000000
2012/06/29	140.00000000	0.00000000	-106.00000000	140.00000000	34.00000000

The impact of yield rate is straightforward now.  $POH(6/18) = -40$ ,  $NR(6/18) = SS - POH(6/18) = 60$ ,  $PORC(6/18) = NR(6/18) / 0.9 = 67$ , and  $PAB(6/18) = POH(6/18) + PORC(6/18) = 27$ .

- *Impact of Scrap Rate*

In order to see clearly the impact of scrap rate on MRP result, we reset the yield rate to 100%. The MPS result of black shoe is as the followings:

BasicData PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedC					
GrossRequirementDate	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2012/06/18	140.00000000	0.00000000	-40.00000000	60.00000000	20.00000000
2012/06/20	300.00000000	0.00000000	-280.00000000	300.00000000	20.00000000
2012/06/21	120.00000000	0.00000000	-100.00000000	120.00000000	20.00000000
2012/06/22	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/25	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/26	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/27	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/28	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000
2012/06/29	140.00000000	0.00000000	-120.00000000	140.00000000	20.00000000

The BOM for black shoe is:

材料表維護 - CORB2301 [Entity : 0020-0020]					
View DataOperation DataOutput SingleRowButtons ExtraTools Exit					
Entity	EntityName	BOMID	BOMName	BOMType	Re...
0020	0020	black_shoe	black_shoe	Assembly	
BasicData AnalysisData MaterialData EngineeringChangeData A					
Item	InventoryUM	Structure	QuantityPer	BaseQuantityPer	ScrapRate
black_face	EA	Normal	1.00000000	1.00000000	5.00%
mid_sole	EA	Normal	1.00000000	1.00000000	0.00%
out_sole	EA	Normal	1.00000000	1.00000000	0.00%

In WorkOrder program of NEO SOA-ERP system, click ChooseBatchAddSource and then select PlannedOrder to automatically create 9 work orders for black shoe:

工令單維護 - MFGF1010 [Site : 0020-0020]							
View DataOperation DataOutput SingleRowButtons MultipleRowButtons ExtraTools Exit							
WorkOrderNo	Status	Item	BOM	Routing	WorkOrderStartDate	WorkOrderFinishDate	WorkOrderStartQuantity
WO1206000019	Open	black_shoe	black_shoe	0020	2012/06/18	2012/06/18	60.00000000
WO1206000020	Open	black_shoe	black_shoe	0020	2012/06/20	2012/06/20	300.00000000
WO1206000021	Open	black_shoe	black_shoe	0020	2012/06/21	2012/06/21	120.00000000
WO1206000022	Open	black_shoe	black_shoe	0020	2012/06/22	2012/06/22	140.00000000
WO1206000023	Open	black_shoe	black_shoe	0020	2012/06/25	2012/06/25	140.00000000
WO1206000024	Open	black_shoe	black_shoe	0020	2012/06/26	2012/06/26	140.00000000
WO1206000025	Open	black_shoe	black_shoe	0020	2012/06/27	2012/06/27	140.00000000
WO1206000026	Open	black_shoe	black_shoe	0020	2012/06/28	2012/06/28	140.00000000
WO1206000027	Open	black_shoe	black_shoe	0020	2012/06/29	2012/06/29	140.00000000

The work orders of open status represent the confirmed planned orders. As MRP considers only the confirmed planned orders, work orders must be created so that the MRP of the components can be calculated.

Click MRP button on the PlanExecution user interface, NEO SOA-ERP starts to execute the MRP procedure for the opened work orders of the finished goods. When it is completed, use PlanningResultInquiryByItem to check the MRP result of black face as the followings:

BasicData PlanningData SupplyDemandAllocationInquiry ActionMessageInquiry TimePhaseDataInquiry PlannedC					
GrossRequirementDate	GrossRequirement	ScheduledReceipt	ProjectedOnHand	PlannedOrderReceipt	ProjectedAvailableBalance
2012/06/18	63.00000000	0.00000000	-13.00000000	13.00000000	0.00000000
2012/06/20	316.00000000	0.00000000	-316.00000000	316.00000000	0.00000000
2012/06/21	126.00000000	0.00000000	-126.00000000	126.00000000	0.00000000
2012/06/22	147.00000000	0.00000000	-147.00000000	147.00000000	0.00000000
2012/06/25	147.00000000	0.00000000	-147.00000000	147.00000000	0.00000000
2012/06/26	147.00000000	0.00000000	-147.00000000	147.00000000	0.00000000
2012/06/27	147.00000000	0.00000000	-147.00000000	147.00000000	0.00000000
2012/06/28	147.00000000	0.00000000	-147.00000000	147.00000000	0.00000000
2012/06/29	147.00000000	0.00000000	-147.00000000	147.00000000	0.00000000

The safety stock for black face is 0 and the lot sizing rule is LFL. The gross requirement of the component equals the BOM explosion of the planned order receipt (PORC) of its parent item plus the expansion of the scrap rate. The formula is as the following:

$$GR(\text{component}) = PORC(\text{parent}) * \text{quantity-per in BOM} / (1 - \text{scrap rate})$$

For example, black shoe's  $PORC(6/18) = 60$  brings black face's  $GR(6/18) = 60 / 0.95 = 63$ .

## Conclusion

In this chapter, we discuss the MPS/MRP procedure in NEO SOA-ERP system, which follows the standards of APICS as other systems such as SAP and Oracle do. Though users do not have to write the MPS/MRP programs, understanding the details of MPS/MRP procedure is important. If the users do not understand the algorithms of MPS/MRP, they may not be able to properly apply MPS/MRP to their daily business practices.