SMS – the Missing Link
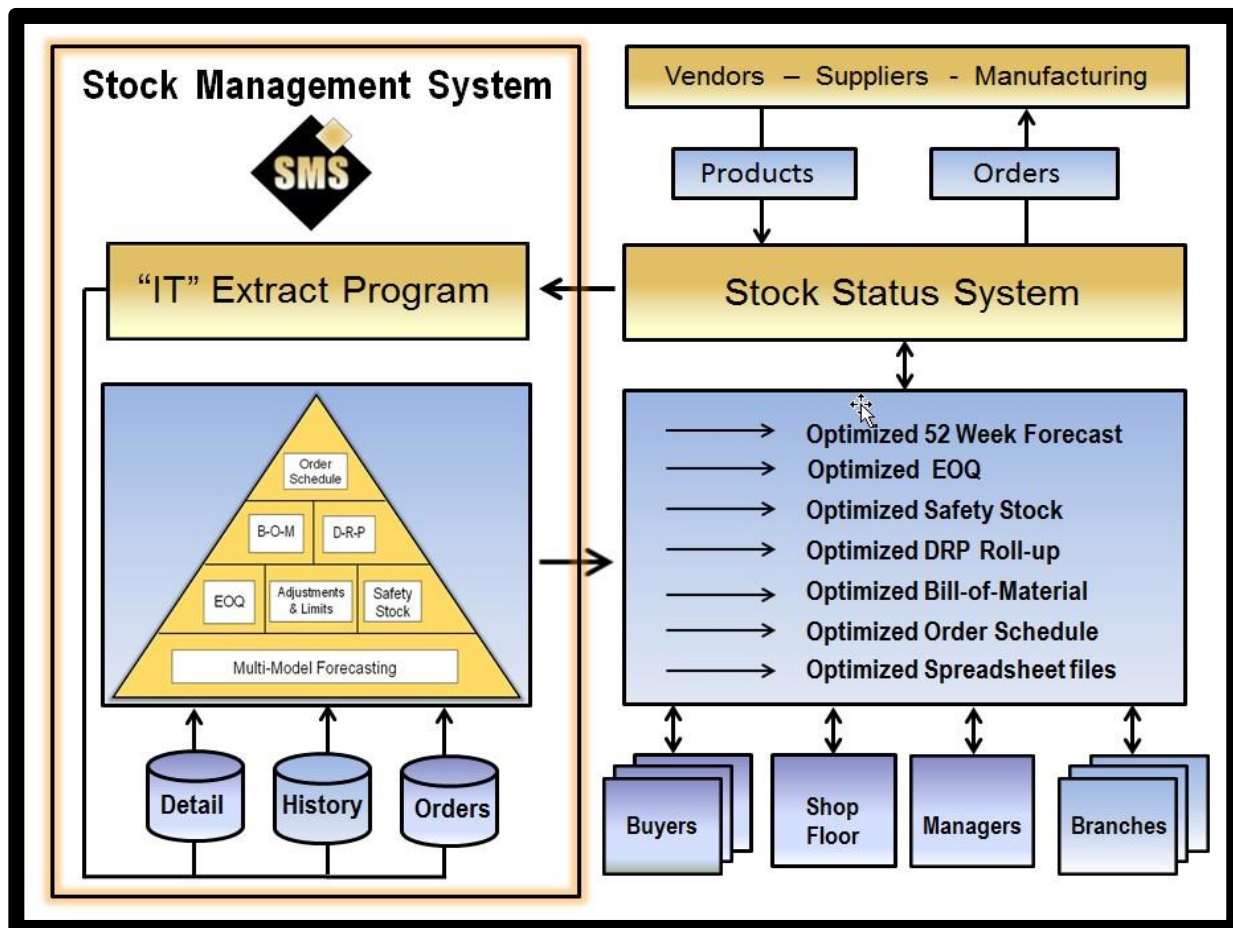
Decision Associates' **Stock Management System (SMS)** is a unique software component linking the precision of leading Stock Status Systems to the "science" of proper forecasting and replenishment planning. Stock Status Systems record and trigger actions in a "real time" mode. However, these systems base their actions on guesswork and "user intuition" which, in turn, improperly defines key parameters for real-time operation.

The SMS approach begins with Stock Status data. It builds a proper forecast derived from a selection of forecasting models - then selects a "least error" technique. Based on the error associated with this selection, SMS determines the proper EOQ and Safety Stock needed. Incorporating orders already placed, SMS translates these optimized results into an optimal ordering schedule which is easily reviewed each week for appropriate ordering and planning actions. In addition, a corresponding update is sent back to your Stock Status System.

Your Stock Status System can now operate with intelligent and optimized parameters … .. not just guesswork and "user intuition".

What makes SMS different?

The answer is simple! *SMS* provides a powerful "missing link" that all Stock Status systems lack - comprehensive forecasting and "time phased" replenishment planning*.* Many of today's leading Stock Status Systems say they address forecasting, but a closer look reveals only rudimentary forecasting algorithms. Further, these systems do not base EOQ or safety stock calculations on any forecast whatsoever. This, in turn, renders their MIN (forecast + safety stock) and their MAX (EOQ + MIN) invalid. All Stock Status Systems are designed to track and show stocking levels at any point in time. They trigger orders based on human intervention (i.e., "intuitive" guesses at MIN and MAX). They have no idea what the coming year brings!

What about "Slow Moving" and "Lumpy" items?

Many items in inventory are "Slow Moving", "Lumpy" or even "No Moving" items. *SMS* includes "Spare Parts" logic to determine proper spares levels for these items. Critical items with infrequent activity can be stocked according to service level (criticality) and failure (MTBF) rates. Items which may be "Lumpy" with sporadic sales or usage are analyzed through consideration of item cost, lead time and service level (criticality). Even items with no activity during the past 5 years can be checked through analysis of "number in service", lead time, MTBF and service level (criticality).

Integration is easy!

SMS takes basic data from any Stock Status system. It's already been installed with a wide variety of Stock Status Systems in use today. SMS is in use with products such as *SAP©, MIMS©, CINCOM©, Oracle©, J.D. Edwards©, BaaN©, Microsoft Dynamics©* and many more. Data is downloaded - *SMS* processes and recommends - you review and approve - then your recommended orders are uploaded automatically. Our users routinely review 20,000 items per planner within 2 hours. *SMS'* exception reporting function focuses attention on the specific items that need attention. Rather than "fight fires" because there are so many items and so little time, *SMS* keeps you focused on the few items that need attention. You can actually manage your inventory - not just try to keep up with it.

Windows© based!

SMS operates on any Windows© platform from Windows XP© through Windows 10©. *SMS* operates on a user's hard drive or on any network. SMS even works well on "thin client" architecture. It requires minimal memory and small amounts of storage space. There is no limit to the number of users that can access SMS. It can be run as often as you wish. Many planners process weekly and order every Monday morning!

Works with your inventory operation!

SMS works well with the three types of inventory operations most prevalent in industry today - manufacturing, distribution and maintenance. Advanced features such as Bill-of-Material processing, superseding part logic, DRP "roll-up" processing and "slow moving" spares logic allow for a "custom" fit at an "off-the-shelf" price.

How does SMS optimize your inventory?

SMS provides the best availability of parts at the least cost. Because *SMS* properly sets key parameters such as safety stock, EOQ, MIN and MAX values, future orders do not create unnecessary spending. *SMS* identifies and eliminates them. *SMS* determines proper forecasts for your inventory consumption patterns - then tunes EOQ, safety stock and ordering schedules to fit those patterns. All this is done without lengthy implementation struggles and without modifying your existing Stock Status System.

SMS vs. Stock Status

Is *SMS* just another Stock Status System? Absolutely not! In fact, it is not a Stock Status System at all. It is an automated inventory analysis system that focuses attention on what to order. Where does *SMS* fit into your current system's flow? Take a look at these functions and it becomes apparent just what a valuable function *SMS* provides - and your Stock Status lacks.

Function	Stock Management	Stock Status
Online Transaction Processing	No	Yes
Accounts Receivable	No	Yes
Accounts Payable	No	Yes
Shop Floor Control	No	Yes
Production Scheduling	No	Yes
Purchase Order System	No	Yes
Open Orders Database	No	Yes
Vendor Database	No	Yes
Multi-Model Forecasting	Yes - Best Fit from 15 Models	No
Forecast Controls	Yes - "Top/Down" and "Bottom/Up"	No
Safety Stock Based on Forecast	Yes	No
Safety Stock Based on Service Level	Yes	No
Calculate 365 Daily Forecasts	Yes	No
EOQ Based on Forecast	Yes	No
"Lumpy Demand" Safety Stock Logic	Yes	No
"Slow Moving" Safety Stock Logic	Yes	No
Time Phased Replenishment Plan	Yes - 52 Weeks Out	No - Use Simple Min/Max
Combine DRP into Replenishment	Yes - Unlimited Levels	No - No Time-Phased Plan
Combine BOM into Replenishment	Yes - 99 Level BOM	No - No Time-Phased Plan
Automated EOQ Review	Yes	No - Done Manually (or Never)
Automated Safety Stock Review	Yes	No - Done Manually (or Never)
"What if" Simulation Capability	Yes - Can Change any Variable	No
Identify Overstocked Items	Yes	No - Only highlight Need to Order
Work Screen to set Initial Spares	Yes	No

SMS is good at what it does. Valuable Stock Status System data is a must for any analysis tool. When these two are coupled together, your productivity and efficiency improve dramatically. Stock Status Systems tell you where your inventory is at the moment. ***SMS tells you where you should be!***

Stock Management System
Decision Associates, Inc.

Forecasting Approach

The *SMS* approach is a fast and automatic way to forecast stock usage by analyzing past demand patterns. A variety of statistical models are applied to see which best fits those patterns. Since each item has a unique pattern, applying these models will cover all patterns and objectively select the best model.

Other software approaches are limited to a pre-defined model choice. Some "forecasting" software lacks comprehensive replenishment planning capability. Other "forecasting" software requires seasonal factors, manual trend controls and other manual controls for each item to be forecasted. Further, customization of these models is cumbersome since they have to be manually addressed by the user individually.

SMS provides 15 statistical models which are precise, yet easy to customize. There are 5 steps:

1. **Forecast Simulation -** *Apply all models to analyze existing demand patterns.*
2. **Error Qualification -** *Check simulated forecasts and remove bias or volatile forecasts.*
3. **Model Selection -** *Review remaining models and select model with lowest error ("best fit").*
4. **Forecast Calculation -** *Apply "best fit" model to forecast the coming year.*
5. **Forecast Adjustment -** *User adjusts forecast (if necessary) to reflect current conditions.*

SMS includes the following statistical models:

- Moving Average (3 month trend / 6 month trend / 12 month trend)
- Trend Average (3 month trend / 6 month trend / 12 month trend)
- Seasonal [This Year = Last year] - (No trend / 3 month trend / 6 month trend / 12 month trend)
- Single Exponential Smoothing ("alpha" .08/ .25/ .50)
- Linear Regression (No adjustment / with adjustment)
- Custom Exponential Smoothing (%alpha+= user value)

"Slow Moving", No Moving" and "Lumpy Demand"

Items with little (or no) activity are known as "Slow Moving" or "No Moving" items. These are often found in maintenance inventories such as those in public utilities. These can be large and expensive. They can be small and inexpensive. They are often critical and must be available in case of emergency. An inventory planner knows that there will be some demand, but has no idea when or exactly how much will be needed. As you might expect, these items usually have no forecast. Instead, SMS will predict how many will be needed and store that number as a safety stock. For example, there may be 20 generators in use and each costs $10,000. Storage of 5 for emergency use would be an expensive capital investment. Storage of only 1 may result in a critical outage of 2 at the same time. SMS determines the proper "spares level" to stock based on past usage (if any), MTBF rates, "number in service" and criticality (i.e., service level). This is automatic and is done along with more active items. This logic keeps a portion of the average annual usage based on criticality (i.e., service level) then factors it based on lead time.

Items that are sold on a sporadic basis are known as %umpy Demand+items. These are common in distribution inventories. The %umber-in-service+has no meaning for these items, but they do have some activity during the past two years. Demand could be high in some months while other months have no activity at all. Projecting a safety stock for these items is appropriate like %Slow Moving+items, but is more a function of which month has the highest demand. Planning for this peak demand is the key here with lead time and cost being factors as well. *SMS* projects a target volume for the coming year and retains a portion of that value as a safety stock. This calculation takes into account the cost and delivery time of the item then factors it according to criticality (i.e., service level). These items are likely to have a forecast as well as safety stock.

Safety Stock

What is safety stock and why is it important? Safety stock is a buffer of extra stock designed to compensate for forecast error. It is one component in determining the MIN used as a trigger for ordering. When an item reaches a MIN it is supposed to have enough to last (usually one lead time of usage) until the new order arrives. If all forecasts were perfect, there would be no need for safety stock. They are not. Hence, the safety stock becomes a buffer for imperfect forecasts. Each statistical forecast has an error. Some errors are large (unpredictable items) while others are small (stable items with high volumes). This error dictates how much buffer stock is expected for the coming prediction. This is known as the safety stock for an item.

Both forecast error and criticality (i.e., service level) can affect safety stock. More critical items will have higher safety stock levels. Items with higher forecast errors will have higher safety stock levels as well. A combination of both factors will impact this value, and each item can be different in its forecast pattern. As service level approaches 99% the cost of extra stock becomes extremely high. Always be careful not to abuse this parameter.

Economic Order Quantities – EOQ

Determination of the proper amount to order is a key step in optimizing inventory investment. Procuring a small quantity every month may minimize storage costs and keep stock low. However, it may result in higher administrative costs to place these orders and handle the stock each month. Conversely, ordering once a year may mean minimal administrative costs. However, this approach would certainly mean high carrying costs and storage costs to keep extra stock on the shelf when it is not needed.

The Economic Order Quantity (EOQ) is a value derived from projected forecasts. After a forecast is determined for an item, SMS compares various options. *SMS* further compares the cost of carrying and storage vs. the cost of administration and handling for each option. *SMS* finds the EOQ quantity which minimizes this combined cost. *SMS* determines the right size to procure - not too much, not too often, not too little. This is known as the *"Total Annual Cost"*. Carrying cost is known as the *"Cycle Stock"* cost. The administrative cost of handling orders is known as the *"Receiving Cost"*. In some cases, safety stock and purchase F.O.B. terms may have a small impact. The sum of all these should be the lowest point.

This process is shown below and in the subsequent discussion of calculation approach. The lowest point of the RED line indicates the proper Replenishment Quantity to buy.

EOQ Components
Determining Least Annual Cost
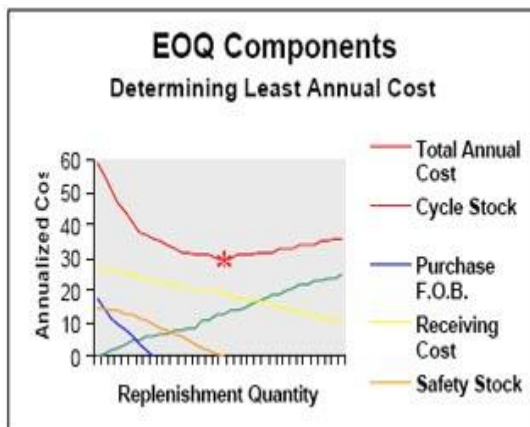
Here lowest cost = 30, and EOQ for this cost = 20 units

Determining the proper EOQ obviously requires a reliable forecast. All Stock Status Systems base their equivalent EOQ value on past history . not SMS.

If an item is being used more frequently, this Stock Status EOQ will be too small. If the item is declining in use, the Stock Status EOQ will be too large. In either case, a Stock Status EOQ is only a guess and may miss the mark.

The result is an improper and unnecessary investment more often than not. SMS bases EOQ on the projected forecast and tunes it accordingly.

Time-Phased Replenishment Planning

Unlike Stock Status Systems, *SMS* breaks down the projected forecast into 365 days. This could mean different values for each day of the year. If an item is seasonal, summer values could be much higher than winter values. *SMS* rolls these daily projections up into weeks. Since the Stock Status System has a record of all expected orders coming in, *SMS* can blend these weekly forecasts and scheduled orders into a replenishment plan detailing 52 weeks of stocking levels.

SMS starts with the current on-hand inventory level. Then it simply deducts weekly forecasts and adds weekly replenishments already scheduled. *SMS* also takes into consideration safety stock and deducts it from the on-hand at the end of lead time to project a "worst case" scenario. Each week a stocking level is projected and, when negative, *SMS* determines that an order should be scheduled to arrive in that week. Since that order should have been placed one lead time in advance, *SMS* can determine when orders should be placed. *SMS* has also determined the proper EOQ which means that *SMS* can show exactly how much to order and when to order it. This becomes a "time-phased" replenishment schedule. This schedule is unique to *SMS* and is an extremely useful tool for inventory planners to use.

Stock Status Systems simply determine if the on-hand value goes below an arbitrary MIN value (usually an "intuitive guess" MIN value), then orders a Stock Status EOQ (usually an "intuitive guess" as well). Stock Status Systems do not care if the on-hand quantity approaches several years of excess - no MIN trigger has been hit. Thus, Stock Status Systems usually encourage over-stocking of inventory. SMS will address this over-stock problem by minimizing the EOQ and setting a proper MIN (safety stock plus lead time forecast).

SMS places each item into an ordering code category. Each of these categories makes it easy for the user to review items based on a specific condition. The lead time horizon is the proper planning period for analysis. If the lead time is correct, any item can be ordered and delivered within this lead time. With this in mind, requirements needed before lead time require some expediting action. Ordering before lead time means unnecessary (and excessive) ordering. Ordering time is a critical part of inventory optimization.

SMS ordering codes are:

- *(-3)* **Current Back Order**
- *(-2)* **Projected Out-of-Stock before lead time**
- *(-1)* **Normal Reorder** *(may use some safety stock)*
- *(0)* **Balanced Item** (*not more than one EOQ - not a negative balance*)
- *(+1)* **Overstocked** *(not ordering more)*
- *(+2)* **Overstocked** *(still ordering - adding to the excess)*
- *(+3)* **Surplus** *(more than 1 year supply)*

The above categories represent each item's stocking level at the end of the lead time horizon. For example, if an item has more than one EOQ left at the end of lead time it is over stocked (code +1). If that item also has outstanding replenishment orders coming into stock (increasing on-hand), it becomes "over- stocked and still ordering" (code +2). A review of these +2 items would be an excellent strategic tool to cancel these unnecessary orders or push them out into the future to prevent unnecessary stock build-up. Careful review of these over stocked reports in SMS helps keep inventory investment low.

Conversely, an item which may have stock on-hand at present could be headed for a shortage if SMS shows that the on-hand stock will run out (e.g., go negative) in week 6 for example. If the lead time is 8 weeks, then some expedite action must be taken to get delivery faster than the normal 8 weeks. These types of items are "stock outs" waiting to happen. There is a hidden cost here as well. Many times a planner will have to pay a premium for expedited delivery (i.e., air freight charges, overnight charges, etc.). Not ordering enough also impacts the cost of inventory.

Master Views

The *Master Views* selection is the choice to see item detail. There are three main sections . the *Forecast Detail* section, the *Replenishment Plan* section and the *Current Orders* section. In the center of the view specific item details are located. These are data fields passed down from existing Stock Status systems and can include user overrides in the *EOQ Control* section or the *Safety Stock* Section (shown on later pages).

Stock Management System - Decision Associates - Version 10.1 - Exxon-Mobil - September 2014

Item	Forecast Class	Close
		Search

Item:	08929875	Prior	Next

Desc: HOSE * S2

Forecast Class	Series Code	Supplier
S	2B	ZZ

Forecast Detail

12 Month Moving Average		Error %	6	Model	13

	2 Yr Ago	1 Yr Ago	Forecast	Adjusted	Modify
Sep	3,867	3,507	4,235	4,235	
Oct	4,254	4,305	4,235	4,235	
Nov	4,211	4,881	4,235	4,235	
Dec	3,871	3,858	4,235	4,235	
Jan	4,497	4,589	4,235	4,235	
Feb	5,146	4,698	4,235	4,235	
Mar	3,987	4,602	4,235	4,235	
Apr	5,847	4,428	4,235	4,235	
May	3,401	3,687	4,235	4,235	
Jun	3,117	3,458	4,235	4,235	
Jul	3,692	3,984	4,235	4,235	
Aug	3,214	4,829	4,235	4,235	
	49,104	50,826	50,820	50,820	

Comment

Model Family	0	Sensitivity %	0	Alpha Factor	1.0

2 Yrs Ago   1 Yr Ago   Forecast
5847 ... 2923

Available

Forlead	33,197
Onhand	6,209
Backord	0
Price $	8.80
Cost $	2.64

Safety Stk

Act	7,764
Adj	0
Max	0
Min	0
Weeks	8

Item Detail

Carry Cost	0.050
Ord Cost $	25.00
Leadtime	14
Service Level	99
Item Inv Class	
Plan Code ID	

EOQ

Act	4,867
Adj	0
Inc	0
Min	0
Max	0
Weeks	0

Slow Moving

In Use	0
Fail Rate	0.00
Slow Moving	R

Ord Code

Code #	-2
Understocked	

Current Orders

Total Orders:		0

1-7	8-14	15-20

Due Date	Quantity	Pch Order #
9/15/14	71	
9/22/14	2,367	
10/29/14	2,344	
10/06/14	4,047	
11/13/14	2,408	
/ / 0	0	
/ / 0	0	

Master View	Print	Close	Week of	Sep	15

Replenishment Plan

Item	Forecast Class	Reorder Point
08929875	S	40,961

	Weeks 1 -26				Weeks 27 -52		
	Forecast	Futures	Replens	Position	Adds	Order	Week
Sep - 15	2,388	1,400	71	3,892		29,202	37
Sep - 22	2,388	1,400	2,367	3,871			38
Sep - 29	2,365	1,400		1,506		4,867	39
Oct - 06	2,357	1,400	4,047	3,196			40
Oct - 13	2,356	1,400		840		4,867	41
Oct - 20	2,356	1,400		-1,516			42
Oct - 27	2,366	1,400	2,344	-1,538		4,867	43
Nov - 03	2,388	1,400		-3,926	4,867		44
Nov - 10	2,388	1,400	2,408	961		4,867	45
Nov - 17	2,388	1,400		-1,427	4,867	4,867	46
Nov - 24	3,098	1,400		342			47
Dec - 01	2,356	1,400		-2,015	4,867		48
Dec - 08	2,357	1,400		496		4,867	49
Dec - 15	2,356	1,400		-9,624	9,734		50
Dec - 22	2,356	1,400		-2,246	4,867		51
Dec - 29	2,357	1,400		264			52
Jan - 05	2,356	1,400		-2,092	4,867	4,867	1
Jan - 12	2,356	1,400		419			2
Jan - 19	2,356	1,400		-1,937	4,867		3
Jan - 26	2,504	1,533		426		4,867	4
Feb - 02	2,592	1,533		-2,166	4,867		5
Feb - 09	2,629	1,570		72			6
Feb - 16	2,629	1,570		-2,557	4,867	4,867	7
Feb - 23	3,464	1,710		-1,154	4,867		8
Mar - 02	1,266	310		2,447			9
Mar - 09	1,378	422		1,069			10

This view is used after a planner has completed review of his Order Code reporting. Planners will usually review *Shortages (-2 reports)* and *Unnecessary Orders (+2 reports)*.

An experienced planner is familiar with his database of items and can quickly see when a recommendation from SMS might be worth a more detailed look. When this occurs, that planner notes the item and reviews that list after finishing his review.

A look at this screen will usually put the SMS recommendation into the proper perspective and a decision can be made regarding the order.

Forecast Detail Section

The *Forecast Detail* section will enable access to all variables, controls, overrides and adjustments that can be made by the user. This is also the view section that enables the user to modify the results (i.e., suggested orders) before such information is sent back to the host via the *Data Upload* processing choice.

This section shows user controls that may have been placed (i.e., Model Family, Sensitivity, and Alpha Factor). A Comment line is also available for a quick note about the adjustment, if any. Above the data columns, SMS information is shown (i.e., Forecast Model description, Error %, Model Number and Bias/Volatile. A "Modify" column is also shown which enables the user to enter specific forecast adjustments if desired.

Data will be split among various planners so that each planner can work concurrently on review and adjustment. After each analysis, that planners orders and adjustments are retained and passed back to the master *SMS* database where they are retained until that planner deletes them).

The *Forecast Detail* section shows demand history, forecasts, forecast adjustments and forecast statistics. A detailed screen description is contained on subsequent pages. Buttons along the top of the screen enable the planner to move back (prior) and forward (next) or to a selected item (locate). The *Close* button is the only way to exit this view, as the menu choices are not available at the top of the screen during entry into this view.

Current Orders Section

SMS considers current replenishment orders that may have already been placed. Once *SMS* has reached a steady state, these would usually be orders that were recommended by *SMS* in preceding weeks.

The Current Orders section shows the detail of outstanding orders (i.e., orders already place and scheduled to come into inventory on the dates shown). These orders also indicate order number (if provided on the download file) for easy cross reference to the host system. *SMS* allows for up to 20 current orders to be displayed. They are displayed in 3 "tabs"

These orders will remain in the planners Stock Status System until received and removed when received into stock. Receipt and removal of these orders is a chronic problem for many planners. *SMS* can focus on these orders and targets past due orders through exception reporting, making "clean up" easy.

Replenishment Plan Section

The Replenishment Screen is located at the right of the SMS Master View. It has two %tabs+to enable a complete look at all 52 weeks in the coming year.

The Replenishment Plan section shows weekly replenishment detail calculations including order receipts, forecasted demand, dates when orders are needed and when orders should be placed. SMS then calculates a 52 week Replenishment Plan. All 52 weeks can be viewed.

Master View	Print	Close	Week of	Sep	15

Replenishment Plan

Item	Forecast Class	Reorder Point
08929875	S	40,961

	Weeks 1 -26			Weeks 27 -52			
	Forecast	Futures	Replens	Position	Adds	Order	Week
Sep - 15	2,388	1,400	71	3,892		29,202	37
Sep - 22	2,388	1,400	2,367	3,871			38
Sep - 29	2,365	1,400		1,506		4,867	39
Oct - 06	2,357	1,400	4,047	3,196			40
Oct - 13	2,356	1,400		840		4,867	41
Oct - 20	2,356	1,400		-1,516			42
Oct - 27	2,366	1,400	2,344	-1,538		4,867	43
Nov - 03	2,388	1,400		-3,926	4,867		44
Nov - 10	2,388	1,400	2,408	961		4,867	45
Nov - 17	2,388	1,400		-1,427	4,867	4,867	46
Nov - 24	3,098	1,400		342			47
Dec - 01	2,356	1,400		-2,014	4,867		48
Dec - 08	2,357	1,400		496		4,867	49
Dec - 15	2,356	1,400		-9,624	9,734		50
Dec - 22	2,356	1,400		-2,246	4,867		51
Dec - 29	2,357	1,400		264			52
Jan - 05	2,356	1,400		-2,092	4,867	4,867	1
Jan - 12	2,356	1,400		419			2
Jan - 19	2,356	1,400		-1,937	4,867		3
Jan - 26	2,504	1,533		426		4,867	4
Feb - 02	2,592	1,533		-2,166	4,867		5
Feb - 09	2,629	1,570		72			6
Feb - 16	2,629	1,570		-2,557	4,867	4,867	7
Feb - 23	3,464	1,710		-1,154	4,867		8
Mar - 02	1,266	310		2,447			9
Mar - 09	1,378	422		1,069			10

The first 26 weeks are on the first %tab+, while the second 26 weeks of this plan are on the second %tab+

The column on the left side of this section indicates weekly dates for this plan for the coming 52 weeks, beginning with the current %processing+date.

Columns (left to right) include:

Forecast . weekly SMS forecast as calculated and adjusted by the planner

Replens . scheduled (incoming) orders that the planner has already placed

Position . the net stock availability (on-hand less forecast plus replenishments)

Adds - the time slot that SMS requires delivery of the replenishment order

Order . the time slot that SMS needs to place the order for delivery within one lead-time (maybe shorter if expedite is required)

The first negative stock position is shown in the ***"Position"*** column and is highlighted in red during the week of Oct-20 (week 42 on the right side). Safety stock is not deducted until the end of lead-time which is highlighted in week Dec-15 shown in bold red type. Note that the %lead time+week is highlighted in red on the left side of this section. This item has a lead time of 14 weeks which falls in the week of Dec-15.

There are several %negative+weeks indicating the need for several orders. All ***"Adds"*** through lead time (plus one week) are summarized and placed on the ***"Order"*** column to be ordered today. Thus, 29,202 units are required to be ordered today to be received as needed. In this case, this total order must be expedited since some of the ***"Adds"*** fall before the lead time of 14 weeks.

The ***"Reorder Point"*** (upper right corner) for this item is 40,961 which represents the lead-time forecast + Safety Stock (33,197 + 7,764). This is often referred to as the ***"MIN"***.

Specific Item Detail Section

SMS considers user specified data in analyzing current inventory positions. Most data fields are maintained in the users Stock Status System and are passed to SMS so that SMS can be synchronized to these values. In some instances, the current Stock Status system does not have a field for important data fields such as Service level, Carrying Cost, Ordering Cost, etc. The user often maintains these variables in SMS.

Available		Safety Stk	
Forlead	33,197	Act	7,764
Onhand	6,209	Adj	0
Backord	0	Max	0
Price $	8.80	Min	0
Cost $	2.64	Weeks	8

Item Detail		EOQ	
Carry Cost	0.050	Act	4,867
Ord Cost	$ 25.00	Adj	0
Leadtime	14	Inc	0
Service Level	99	Min	0
Item Inv Class		Max	0
Plan Code ID		Weeks	0

Slow Moving		Ord Code	
In Use	0	Code #	-2
Fail Rate	0.00	Understocked	
Slow Moving	R		

The ***Stock Available*** section shows forecast over lead time (FORLEAD) as well as current On hand and current Backorder. Price and Cost fields are also included here.

The ***Item Detail*** section shows Carrying cost, Ordering Cost, Lead time, Service Level, Inventory Class and Planner ID. These are all provided by the existing Stock Status system currently in place.

The ***Slow Moving*** section is used for maintenance inventories which are usually made up of slow moving spares. These items lend themselves to "no forecast/set spares level" approach. Number in-use and fail rate often dictate how many spares are appropriate. The Slow Moving indicator tells whether "Slow Moving" (R) or "Lumpy Demand" (L) switches have been turned on for low usage items. These are two techniques for approximating some level of safety stock where forecasting is tenuous.

The ***EOQ Control*** section shows the SM EOQ as calculated (Act) as well as any user overrides (Adj, Inc, Min,Max, Weeks Supply). SMS includes these overrides in making its calculation.

The ***Safety Stock*** section shows the calculated SMS safety stock value (Act). As with the EOQ values user overrides are also shown as well (Adj, Max, Min, Weeks Supply). These are used in making the calculation as well.

The ***Order Code*** section simply states what ordering category the item falls into. These range from "-3" to (+3) as discussed previously.

There is also a section at the upper right portion of the screen. This includes two fields which the user can utilize to locate a specific item. The "Item" field is self- explanatory. The second field can be user specified. It might be "Location" or any other field type that is valuable to the use. In this case "Forecast Class" has been specified.

The SMS view screen (in entirety) can be moved to any position. The Master View cannot be resized, but the entire SMS window can be expanded. This expansion is often handy when viewing a full SMS report that may have been selected.

SMS Reporting

Order Code Report

This report is the most popular exception report. The example below shows the (-3) code which is a list of "Back Ordered" items. This report enables the planner to focus on "Back Orders" and take quick action to correct these problems. Order Code reports can be printed for each code. The (+2) code focuses attention on excess ordering and allows quick action to cancel or push orders back, thus preventing build-up of excess inventory. The (-2) code focuses attention on item shortages before they happen, thus helping the planner expedite and prevent stock-outs.

Order Code Report - Grouped by Location   **Back Orders (-3)**

Data Extraction Date: *13-Nov-09*   Print Date: *10-May-10*   Print Preview   100%   *Page 1 of 107*

Item Number	Item Description	L/T [Weeks]	On Hand	Back Orders	Leadtime Forecast	Safety Stock	Leadtime Orders	Future Orders	Net Balance	Unit Cost	New Orders	Cost Criteria	EOQ Quantity	Annual Usage	
Location: EU															
MBSK2500-4	BRAKE SHOE KIT	14	135	182	1,400	1,120	0	49	-1,398	65.86	2,574	169,523	99	2,966	-3
CKSK.1	[PT] [XF] REPAIR KIT	9	0	126	1,830	1,464	0	0	-1,956	18.23	3,485	63,531	205	10,710	-3
A83200X1532-430S	CARRIER	9	0	56	2	1	0	0	-58	888.43	59	52,417	1	19	-3
A13200X1532-430S	R.B.CARR.LDL/A3260C	9	0	56	2	1	0	0	-58	858.98	59	50,679	1	11	-3
CKSK.3.2	(PT) REPAIR KIT	10	0	140	1,275	1,020	0	0	-1,415	18.74	2,570	48,161	257	6,718	-3
LRG597	SERVICE CALIPER	5	15	266	10	1	0	5	-256	169.43	264	44,729	8	103	-3
CKSK.6	(PT) REPAIR KIT	9	0	98	1,097	877	0	0	-1,195	19.63	2,214	43,460	246	6,429	-3
CKSK.4	[PT] [XF] REPAIR KIT	9	0	140	2,264	1,811	0	0	-2,404	9.21	4,572	42,108	508	13,255	-3
A373200V1894-342	FWD.CARR.WDL/A326	9	0	28	0	0	0	0	-28	1,495.20	28	41,865	1	2	-3
LRG603	SERVICE CALIPER	4	33	350	5	1	0	4	-318	128.36	320	41,075	8	80	-3

Top

- **Data Extraction Date** — *Data extraction date (usually same day of processing)*
- **Print Date** — *Date the report was actually printed (usually same day of processing)*
- **Page Number** — *Current page of total pages (i.e., 13 of 20)*

From Left to Right

- **Item Number** — *Designator for individual stock item or part (stock-keeping-unit)*
- **Item Description** — *Description of the item (30 characters)*
- **L/T Weeks** — *Total delivery time (weeks) - includes administration, delivery & production time*
- **On Hand** — *Quantity of stock available on the extraction date*
- **Back Orders** — *Stock "not available" against customer demand for this item*
- **Leadtime Forecast** — *Forecast consumption for the Lead Time weeks horizon*
  - broken down to daily values – then summarized into weekly buckets
- **Safety Stock** — *Safety Stock buffer for forecast error and "criticality" of the item*
- **Leadtime Orders** — *Orders already scheduled for delivery before(or at) lead time*
- **Future Orders** — Orders already scheduled but not expected until after lead time
- **Net Balance** — *On Hand less Backorders less Leadtime Forecast Plus Leadtime Orders plus Future Orders*
- **Unit Cost** — *Unit cost per item*
- **New Orders** — *Additional replenishment orders needed – rounded to next EOQ value*
- **Cost Criteria** — *For negative Order Codes, Cost Criteria is New Orders times Unit Cost*
  For positive Order Codes, Cost Criteria is Net Balance times Unit Cost
- **EOQ Quantity** — *The Economic Order Quantity calculated by SMS (may have overrides)*
- **Annual Usage** — *The projected usage (or sales level) for the coming 12 months*
- **Order Code** — *Order Code is shown in the right margin for reference (at top right of report as well)*

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Inventory Performance Summary

This is an excellent way to measure the performance of inventory strategies. More specifically, individual planners can be measured to help better plan future orders. Too much ordering will show up as a high %Current Inventory+number. Improper ordering will show up under the %Projected Shortage+category for ordering %too little+or %too late+. Improper ordering could show up under the %Overstock w/Orders+category for planners ordering too much (usually to protect themselves against stock-outs) which cost the company a great deal of money.

Inventory Performance

Grand Total

Data Extraction Date: *14-Oct-15*   Print Date: *26-Oct-15*

Forecasting   (@ Cost)

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		Totals
1,404,958	1,832,001	1,952,490	3,024,366	2,446,582	2,459,213	2,589,692	2,253,762	2,766,360	2,420,315	2,657,325	3,941,838	Year 1	29,748,902
2,184,180	1,989,821	1,768,835	3,062,705	3,119,777	3,226,407	2,452,910	2,277,839	2,380,875	2,701,477	2,684,560	2,602,224	Year 2	30,451,610
1,441,804	1,322,262	1,366,765	1,461,426	1,493,208	1,398,889	1,529,526	1,427,772	1,436,290	1,489,163	1,381,521	1,393,370	SMS	17,141,996
1,441,804	1,322,262	1,366,765	1,461,426	1,493,208	1,398,889	1,529,526	1,427,772	1,436,290	1,489,163	1,381,521	1,393,370	Adjusted	17,141,996

Safety Stock [1,344,717] + Total Requirement [17,150,779]   =   TRQ   18,495,496

Investment   (@ Cost)

	Total Items	Current Position	Investment Range				

Current Inventory   17,124,478

1/2 EOQ [5,011,945] + Safety Stock [1,344,717] = Target Investment   6,356,662

	68,953	$11,337,575	$11,490,063 Min
% Available: 99%	%: 80.70	$16,607,620 Max	

Inventory Imbalance   10,767,815

Potential Savings [or Cost of Additional Investment] @   10 % Carrying Cost   1,076,781

Order Code Distribution   (# of Items)

(-4) Back Order [No Order]	(-3) Back Order [On Order]	(-2) Shortage [Expedite]	(-1) New Order [On Schedule]	(0) Balanced [No Action]	(+1) Overstock [No Action]	(+2) Overstock [w / Orders]	(+3) Surplus [+1 Year]	(+4) Obsolete [Inactive]
$1,903,099	$159,766	$3,566,630	$50,708	$95,084	$670,316	$1,448,274	$1,311,525	$5,167,506
66	243	990	20	13,980	245	311	175	52,923
0%	0%	1%	0%	20%	0%	0%	0%	77%

Current Turns: [1.0]   Target Turns: [2.7]

Top

- **Data Extraction Date**   *Data extraction date (usually same day of processing)*
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Report section elements include:

Forecasting

- **Month Headings** — *Three character abbreviations of each month listed (Qtys are monetized)*
- **Year 1** — *(left to right) Monthly history totals with annual total at right (2 yrs ago)*
- **Year 2** — *(left to right) Monthly history totals with annual total at right (last year)*
- **Raw** — *(left to right) Monthly SMS forecasts with annual total at right*
- **Adjusted** — *(left to right) Monthly user adjusted forecasts with annual total at right*
- **Safety Stock** — *Safety Stock valuation (@ cost)*
- **Total Requirement** — *Total requirement includes projections for item with sporadic forecasts*
- **TRQ** — *Sum of Adjusted Forecast and Safety Stock for sporadic forecasts*
  - this includes items with no forecast projection but possibly requiring a usage "hit" sometime in the future (i.e., Safety Stock)

Investment (from the left)

- **Total Items** — *Items downloaded by user – and % of inventory available for use*
- **Current Position** — Active inventory (@cost) - % of optimal inventory level
- **Investment Range** — Minimum inventory needed . and maximum inventory to stock
- **Current Inventory** — Cost of inventory already on the shelf (pre SMS optimization)
- **Target Investment** — SMS target inventory (1/2 EOQ + Safety Stock)
- **Inventory Imbalance** — Excess investment (or investment shortage)
- **@ 10% Carrying Cost** — *The excess (or shortage) at the user's carrying cost rate (here it is 10%)*

Order Code Distribution

- **Order Code Category** — *Item count (and % distribution) for each Order Code status*
  - **Back-Orders** — Orders out-of-stock (need replenishment)
  - **Back Orders** — Orders out-of-stock (orders already placed)
  - **Shortage** — Not enough for lead time horizon
  - **Newl Order** — Planning to run out on schedule
  - **Balanced** — No additional orders projected (or needed)
  - **Overstocks** — More than 1 EOQ at the end of lead time
  - **Overstock w/Orders** — More than 1 EOQ and still ordering
  - **Surplus Stock** — More than one years supply of excess
  - **Obsolete** — On Hand inventory bit no activity last 2 years

Order Code Distribution

- **Current Turns** — *Current inventory turns without SMS (from user's Stock Status system)*
- **Target Turns** — *SMS optimized turns if SMS recommendations are followed*

SMS Data Requirements (Basic)

This basic approach to data extraction requires three separate files. **This eliminates any need to merge data fields into one complex file**. These files can be supplied in ASCII format, delimited format, Excel format, Access format or other (if you have a special requirement just call). The strict order of fields is listed below, but the field lengths can be variable and there is no limit to the number of records. Each must be extracted at the same point in time so that they are synchronized with each other. **Three "*separate*" files should be created** - not one spreadsheet with three pages. Each must be in the formats defined below - not just a "dump" in some other format or field order.   Each should be named Detail, History and Orders respectively. If delimited use the ~ sign as a delimiter. Optional fields are (shown in red).

File One – Item Detail (one record per item per location)

Field	Field Name	Field Description	Field Range	Notes
1	Item	Item Number, SKU	20 Alpha-Numeric	
2	Location	Warehouse, Branch	20 Alpha-Numeric	
3	Sub-Location	Branch served by Warehouse	20 Alpha-Numeric	
4	Supplier	Vendor or Supplier	20 Alpha-Numeric	Can be Product Grouping
5	Description	Long Description of Item	30 Alpha-Numeric	
6	On Hand	Available Stock on Shelf	8 Numeric	0 . 99,999,999
7	Back Ordered	Owed+. % unavailable	8 Numeric	0 . 99,999,999
8	Incremental EOQ	Pack Size (i.e. pack of 10)	8 Numeric	0 . 99,999,999
9	Part Cost	Unit Cost of the Item	10.2 Numeric	0.01 . 9,999,999.99
10	Part Price	Unit Price of the Item	10.2 Numeric	0.01 . 9,999,999.99
11	Lead Time	# of weeks for delivery	2 Numeric	1 . 99 weeks
12	Service Level	Item %Criticality+if available	2 Numeric	88 . 99 (Default to 97%)
13	Carrying Cost Rate	Storage Cost (% of Total Cost)	2 Numeric	01 . 50 (Shown as %)
14	Avg Ordering Cost	Admin cost to place an order	7.2 Numeric	0.01 . 99,999.00
15	MIN	Qty to trigger an order	8 Numeric	0 - 99,999,999

File Two - Sales History (one record per issue/sale - usually multiple issues per item)

Field	Field Name	Field Description	Field Range	Notes
1	Item	Item Number, SKU	20 Alpha-Numeric	
2	Location	Warehouse, Branch	20 Alpha-Numeric	
3	Issue/Sale Qty	Transaction quantity	8 Numeric	0 - 99,999,999
4	Issue/Sale Date	Transaction date	8 Alpha-Numeric	MM/DD/YR or DD/MM/YR

File Three – Outstanding Replenishment Orders (one record per order - usually multiple orders per item)

Field	Field Name	Field Description	Field Range	Notes
1	Item	Item Number, SKU	20 Alpha-Numeric	
2	Location	Warehouse, Branch	20 Alpha-Numeric	
3	Order Amount	Quantity ordered	8 Numeric	0 - 99,999,999
4	Delivery Date	Expected date delivered	8 Alpha-Numeric	MM/DD/YR or DD/MM/YR
5	P.O. Number	Order Number	10 Alpha-Numeric	

Example of Delimited Record for the Data Requirements Extract

The record below is an example of a record that would be on the Item Detail file. The example uses a comma for a delimiter, but the ~ symbol would work as well. The ~ symbol is safer in the case that a description has a comma within the field.

"45-98555","CHCAGO","AFTERMARKET","MERITOR","BRAKE LINING",15,0,10,25.43,32.15,12,92,12,5.60

In the event that the ~ symbol is used, the record would look like the one below.

"45-98555"~"CHCAGO"~"AFTERMARKET"~"MERITOR"~"BRAKE LINING"~15~0~10~25.43~32.15~12,92~12,5~60

If it is easier, the extract can treat all fields as alpha. numeric. DAI can translate the file properly upon receipt. In this case, all fields would be surrounded by "xxxx", "45", "25.43", etc, etc. Some programmers fine it slightly easier to extract in this fashion.

Try the Stock Management System at no cost ………

Only the individual planner can determine if SMS is a good fit. Decision Associates, Inc. (DAI) encourages a closer look at SMS. As shown on the web site (www.daiglobal.com), minimal data is required to take a closer look at how SMS would work in your environment. DAI provides a 30 day trial of SMS at no cost. All information is shown under "Evaluation Copies" on the web site including basic data requirements. DAI is happy to provide initial support and a copy for your use so that you can actually run SMS on your computer.

Client references and client visits are available upon request for prospective clients who have completed an analysis of their data. DAI has representatives in Australia, Canada and Britain as well as the United States. Our worldwide list of SMS users includes operations in manufacturing, distribution and maintenance support. Many clients use SMS as their primary replenishment planning tool.   Others use SMS to update key Stock Status parameters.

Whatever your interest, DAI can show you many ways to fit SMS into your operation.

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