

# Improved Inventory Management

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## *A few key issues to derive business benefits through effective Inventory Planning*

### Introduction

As a wholesaler or distributor you know that effective inventory planning is a complex task. Buyers have to manage thousands of items with different demand patterns and ordering preconditions, often without having proper decision support systems to assist them. Poor inventory planning is very costly. Among other things, it involves wrong combinations of stocks, leading to excessive stock levels that result in over-investment, poor demand of capital and lost revenues. Other consequences include out-of-stock issues and too much time spent on the buying process

This paper raises a few issues that wholesalers and distributors can adapt to their business to gain better control of their inventory planning process. This will lead to higher profitability by delivering improved service levels whilst lowering inventory and providing a systems to introduce more cost effective operations.

We will discuss how correct forecasting techniques, calculation of safety stocks and the effective use of early warning systems can improve the overall inventory planning process and improve profits. We will also discuss how these issues are not usually solved properly within ERP systems and what methodology can be used to improve them.

### Do you have an early warning system?

Most ERP systems provide users with reports which show stocked products that have run out of inventory. These reports pinpoint a problem that already exists but do not provide an early warning of a potential stockout. They are in fact "gotcha reports"

Early warning reports can alert the buyer to a potential problem. Examples of useful reports could be:

- A list of items where number of days until stockout is less than the lead time.
- A list that shows all items where the sale during the first week of the month is more than 50% of the month's forecast.
- A list of items where previous days' sales are more than 50% of this week's forecast.
- A list that draws attention to items with unusual activity.

These early warning reports could be restricted to A or B items which are important to your company to prevent buyers from becoming overwhelmed with data. By using these kinds of reports buyers could use appropriate methods such as expediting orders to prevent problems before they occur. It also enables them to manage-by-exception.

### Are you using correct forecasting methods?

One of the most common methods wholesalers and distributors utilize to forecast future demand of products is to average the sales over the previous several months. This method works pretty well for items that are in consistent demand but it does not work well for others. Consider the following example where the forecast is calculated by averaging the sales over the last 6 months and compare it to the actual sales figures:

Item	Jan	Feb	Mar	Apr	May	Jun	Forecast July	Actual July
1	65	71	73	79	85	91	77	97
2	126	119	117	110	105	98	113	91
3	85	82	87	205	82	87	105	84

As can be seen from the above example the forecasting error is very high in all cases and had these forecasts been used for inventory planning purposes they would either have led to excessive stock levels or a stockout situation.

By looking at the figures we see that item 1 has an increasing sales pattern. Item 2 has a decreasing sales pattern, and item 3 has a seasonal sales pattern where sales increase dramatically in April each year.

Due to the fact that different items can have a very different demand pattern it is extremely important to choose the most relevant forecasting method for each item. Examples of forecasting models that can be used based on different types of data are:

- Exponential smoothing – covers a wide range of data characteristics.
- Simple methods - for short or volatile data.
- Curve fitting - identifies the general form of the curve that the data is following.
- Low volume models - for low volume and/or sparse data.
- Box-Jenkins - for stable data sets.

In ever changing business environments it is essential to keep an ongoing review of the forecasting process and change the forecasting methods used when the characteristics of any item changes.

### Effects of unusual activity

Forecasting quality is inevitably dependent on how good the underlying data is. One-off events like a dramatic increase in sales or an unusual dip in demand can dramatically change the forecast for the worse. Consider the demand history for this item:

Jan	Feb	Mar	Apr	May	Jun
205	198	10	210	195	199

In this case only 10 units were sold in March because a stockout occurred during that month. The reason for that was the supplier's inability to deliver what was needed. This will obviously reduce the quality of future forecasts as it does not reflect normal demand.

It is important to have a system in place that draws attention to unusual activities and buyers should carefully examine those transactions and adjust the data used for forecasting purposes in a way that will reflect normal demand.

### How do you determine your safety stock levels?

Safety stock is reserve inventory kept to:-

- avoid stockouts in case of unusual demand
- cover for the potential inaccuracy of the demand forecast
- make allowance for failure in suppliers' services

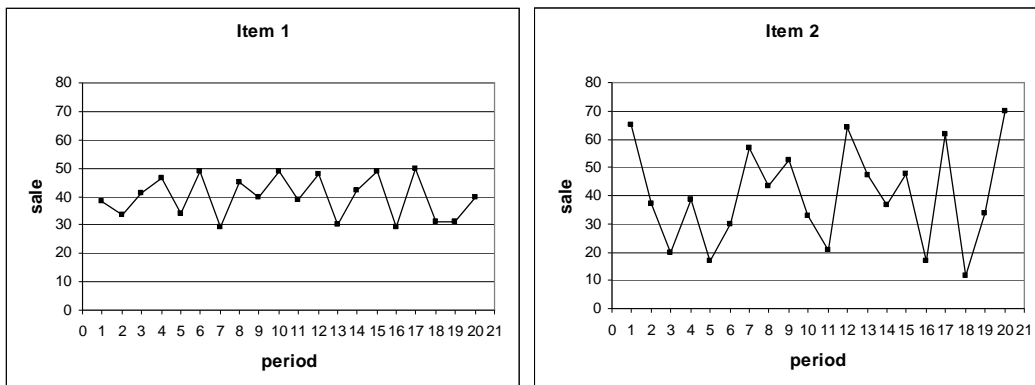
When determining the safety stock level it is necessary to look at the order period which is the lead time in addition to the time when the next order is made.

It is very common that ERP systems to offer "rule of thumb" methods of determining the safety stock levels over a range of products. These include for example:

- A percentage of anticipated demand during the order period
- A specific number of days' supply

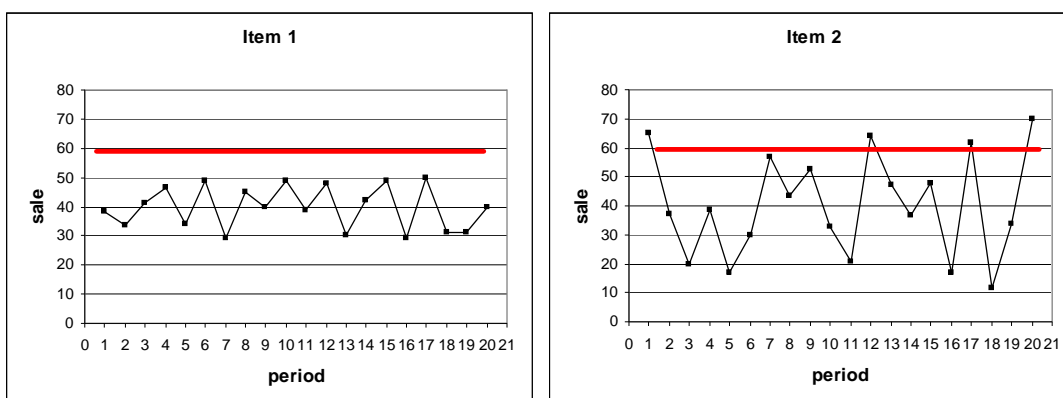
It can be dangerous to apply these simplistic rules over a range of products due to the fact that the predictability of items can vary greatly and so can suppliers' lead times.

Let's look at an example of 2 items. Orders are usually made at the beginning of each month and the lead time is one month. On the graph below we see that the average sale on both items is 40 units but the difference in predictability varies significantly between them:



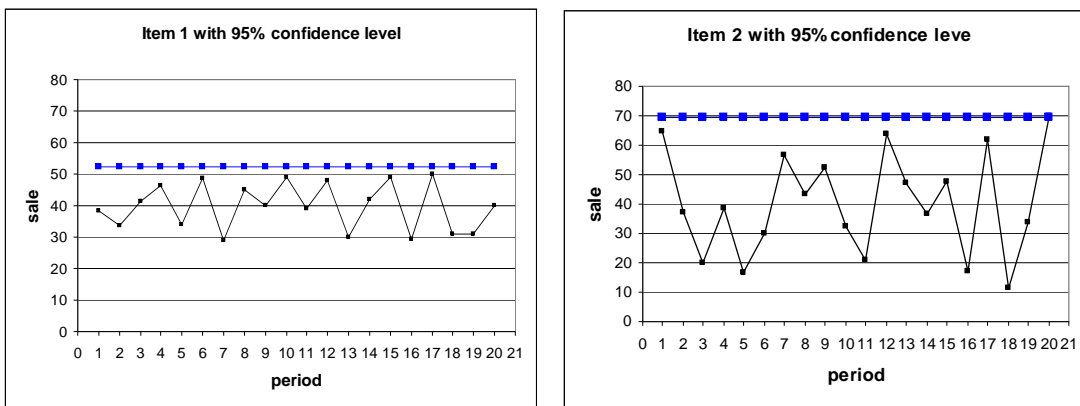
If "a rule of thumb" says that safety stock should be 2 weeks' average sales we would order at the beginning of each month the forecast number of 40 units in addition to the 20 of safety stock bringing the total amount up to 60 units for both items.

This would mean that we would on average have too high a stock for item 1 but we would experience repeated stockouts for item 2 as shown in the graphs below:



The above example illustrates that it is very important to calculate safety stocks based on the predictability of each item.

It is a good practice to categorise items according to their importance, e.g. A, B or C items according to traditional ABC Pareto Analysis and determine for each item the optimal service level for each item. The safety stock should then be calculated based on the predictability and the desired service level. The graphs below show these same two items where the “correct” safety stock has been calculated with a 95% likelihood of not running out of stock (confidence level).



To maintain the same service level on these items we would therefore need to order 50 units for item 1 and 70 units for item 2 at the beginning of each month.

In this paper we have raised a few key issues which we hope will be of use when reviewing your inventory planning process. There are, of course, several other factors distributors need to take into consideration, which we plan to cover in subsequent papers.

### About AGR

Part owned by its staff and IBM Iceland, AGR is a supply chain planning specialist with its main focus on inventory planning solutions. With some 300 users in Belgium, Denmark, Holland, Iceland and the UK, AGR's Inventory Optimiser has a well proven track record in delivering reduced stock levels, improved service levels and effective processes to minimize time and costs.

The AGR Inventory Optimiser is a graphical, easy-to-use and user friendly add on to Microsoft Dynamics NAV. It has been developed over the years in cooperation with numerous companies to help them make some of the most important decisions they confront each day, e.g. how much to order and when so as to have the right products available at the right time.

Although AGR Inventory Optimiser can be linked with a variety of ERP systems, the AGR - Navision combination offers a particularly affordable solution that is easy to implement and can be operational within a matter of weeks.

For further information please contact:

Star Computers Limited  
 Star Centre, Building 3 Hatters Lane, Croxley Green Business Park, Watford, WD18 8YG, UK.  
 Tel +44 1923 246414 .Fax +44 1923 54301 eMail [sales@starplc.com](mailto:sales@starplc.com) Web [www.starplc.com](http://www.starplc.com)