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Abels & Kemmner

WHITE PAPER

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Best Practice Criteria for Lasting and Holistic Inventory Management

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A QUANTUM LEAP AHEAD

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Thanks to our **unique consulting approach**, we help companies achieve sustainable concepts that we validate and optimize and implement in a secure and agile manner.

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Best Practice Criteria for Lasting and Holistic Inventory Management

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Inventory freezes capital, often a lot, of which could be more useful in an-other investment. Inventory also costs money, and often enough more than the company had bargained for. For the statistically average company, a stock reduction of 20% would increase liquidity by 48% or reduce long-term liabilities by 27% . These figures show the entrepreneurial scope of liberty, the reduction of existing inventory levels may provide.

Depending on the evaluation of the various positions' costs concerning the warehousing, the arithmetic operating costs can vary between 19% and 30% of the annual inventory costs. In very rare occasions, the arithmetical costs were less than 15%.

Average values in relation to the stored goods' value:	
Interest of fixed capital	6.5 – 8.5 %
Ageing, wear	3.5 – 5 %
Loss, breakage	2 – 4 %
Transport, handling	2 – 4 %
Storage, depreciation	1.5 – 2.5 %
Storage management	3 – 5 %
Insurance	0.5 – 1 %
Total	**19 – 30 %**

Main arithmetic costs in the calculation of warehousing costs

Imagine, your credit costs amounted to 15%: You would probably limit the investments to those, which are elementary and promise a substantial yield. Unfortunately, the storage costs are hidden in various places in the company. Due to this fact, the total storage costs often fly under the radar, hiding the fact that inventory is often bought at high credit costs and readily, generously overstocked.

If you do not take care of your inventory levels, they will grow. This has been our experience for a long time and has one simple reason:

Basic principle 1: Overstocks are comfortable and have many secret friends

Inventory is an effective lubricant in logistics. The purchase prices in Asia are wonderfully low? We do not want to reduce our product portfolio? Or maintain our material master data? We do not need to

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adjust our material planning system correctly or keep our production lines filled continuously at their optimum? And we do neither want to worry about our customers' demands or risk disagreements with them? Perfect, let us simply overstock and avoid these troubles. In this way, excess stock is a bit like chocolate: It is very pleasing and satisfying, but too much of it will show some negative effects to your (company's) health. Which is why we should continuously monitor our excessive stocks – or how much chocolate we eat.

One popular means to determine excessive stock is the dead stock analysis. Dead stock is the kind of stock which has never been touched during the applied time frame. Which is usually the lowest stock in the warehouse at that given period.

It may initially look completely reasonable to consider the stock which has not been required in the last twelve months as excess stock. This is, however, a much too simple approach when you take a closer look. You surely would not cancel your insurance of contents, if you have not needed it in the last twelve months, would you? To ensure a certain required service level requires a certain safety stock level. Which is, at last, a statistical parameter including the probability of unexpectedly high demands. There is no systematic correlation between the required safety stock and the dead stock. The required safety stock may actually be considerably more than the dead stock, but it may also be much less. In the first case, we would have to add more to the dead stock, in the second case the excess is simply the difference between dead stock and safety stock.

If the dead stock is inefficient in evaluating excess stock, what is? If the quality of material planning and the available data are sufficient, you could compare each article's average demand of the past with the average prospective demand. The prospective average demand would be calculated from the applied material planning parameters and the required safety stock. This idealised prospective can only be but an estimate, since there are a plenty of disturbances affecting material planning. And these are not part of this idealised calculation.

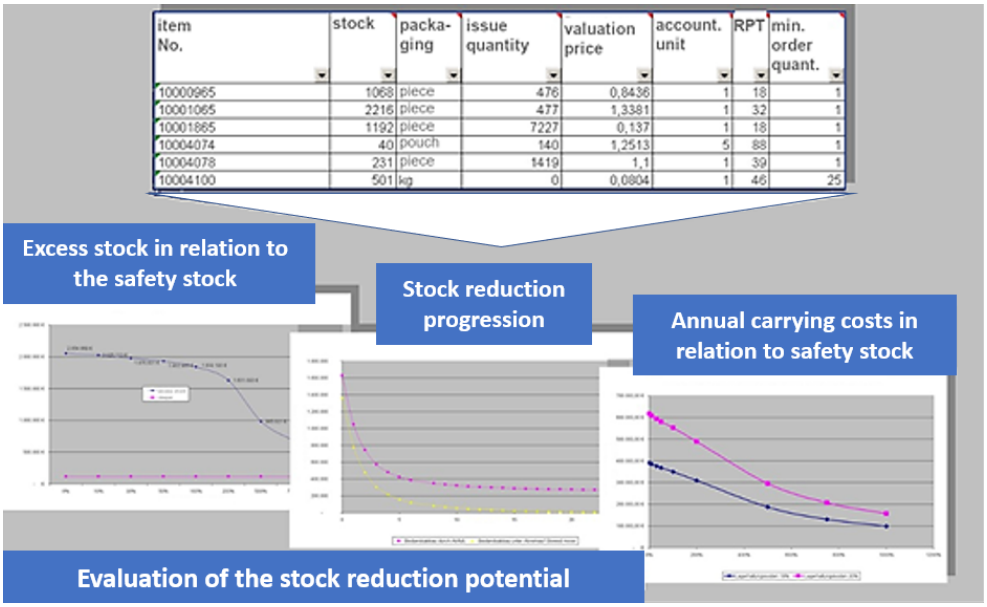

Figure 1 E:S:A-Method for the pragmatic determination of excess stock

The E:S:A procedure provides a simple calculation method to assess excess stock, which we have developed several years ago and recalibrate continuously . For the consent to statistically process the key figures, which are made anonymous, of course, we provide companies with the E:S:A procedure. The only disadvantage of this procedure: Due to statistics, we cannot analyse each article, but can provide exact excess stock figures for each storage level. A closer look regarding the precise point of excess stock and its cause should follow. How to gain a more detailed, but also intricate insight into the article specific excess stocks, will be discussed at the end of this text.

Thus, the first best practice step is:

Best practice step 1:

Successful companies assess their excess stock precisely and regularly and do not settle for the dead stock of their articles.

It does not matter whether you gamble with the dead stocks, compare average stocks or use the E:S:A analysis: You will always need to find out where exactly the excess stock is coming from. Like a headache, excess stock is merely a symptom and you need to find its cause for a sustainable cure.

If you have identified an article or item with actual or assumed excess stock and are now inquiring as to its cause, you will find

Basic principle 2: Every excess stock has its own history

… and it is not made up.

Nobody is causing overstock on purpose, i.e. as a means of sabotage. It merely happens due to erroneous decisions, which seemed like a clever idea at the time they were made.

To determine the unavoidable overstock and which excess stock could have been avoided by which means, is the matter of a roundtable. In this workshop, every department (directly or indirectly) contributing to the inventory level of the item in question, must cooperate. These ‘stock driver workshops’, as we call them, allow the analysis of critical articles’ inventory levels from different perspectives and thus a more intricate identification of the stock level’s cause.

Stock driver workshops usually help to improve the situation by reducing stock levels on short notice. Regular stock driver workshops are thus the

Best practice step 2:

Regular stock driver workshops may help in finding the structural causes of overstock and provide rapid aid.

If you are holding regular stock driver workshops, you will know that the main stock drivers are of a structural nature. A good part of them may be discovered in stock driver workshops but knowing the cause does not necessarily equal providing the cure. You may also have noticed, how the same structural stock drivers keep reappearing, although there is probably an entire universe of stock drivers.

Hence, the means to eliminate the main structural causes for excess stock are also the very foundation of a sustainable inventory management. These main stock drivers will be what we are focusing on for now.

If we look at the beginning of the planning chain, we often find a rather unsystematic approach in the companies. The annual aims for sales and turnovers may be set very precisely, even down to the quota each product group must fulfil. But if it comes to each material which must be planned and scheduled, there often is no exact definition of the actual demands to meet. But this is the very level the company's material flow is processing on. Leaving this gap open means to neglect

Basic principle 3: You need to know where demands are going,

…if you want to point production in the right direction.

There are different methods to improve demand forecasts. In any case, statements concerning each planning object must be made at the logistical de-linking point. The logistical de-linking point is the inventory level down the value stream, at which production is no longer neutral to sales orders, but assigned to a sales order. Different material numbers may have different de-linking points. Each de-linking point requires a stock of the individual planning object. Depending on the location of the de-linking point, the planning object may be a finished good, an assembly or individual parts.

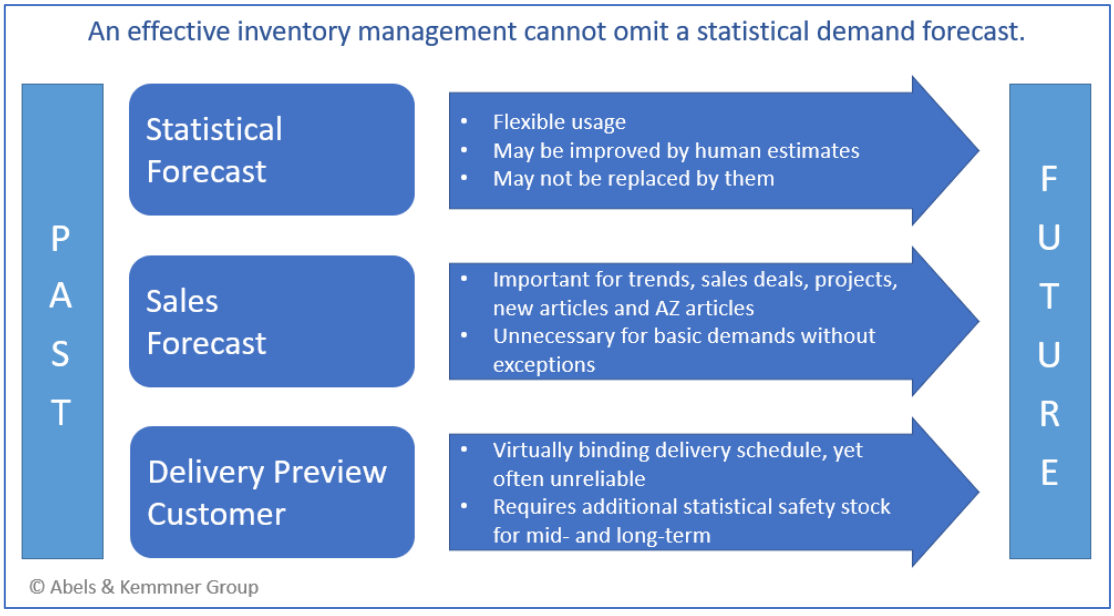

Figure 2 Inventory Management

To achieve reliable figures, statistical forecasts are elementary, even though they may require additional inputs from sales, like sales deals, projects and general expected growth of the market.

Classical forecast procedures as are familiar from your ERP system, should be complemented by distribution free procedures and simulation mechanisms to achieve reliable forecast data.

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Best practice step 3:

The companies leading in inventory management have improved their sales and demand forecasts significantly.

Reliable sales and demand forecasts are essential to improve material planning. And yet, however important the improvement of demand forecasts may be, it is not sufficient for a sustainably effective inventory management. This is because of

Basic principle 4: In material planning, reason is often overextended

… while intuition mostly provides bad advice.

Your main intention of implementing your material planning system probably was to 'improve' your material planners work, since the system provides 'improved' material planning proposals for purchase and production planning. In this particular case, 'improved' means that the users do not need to constantly adjust the material planning proposals concerning quantity and date but can mostly just clear them.

However, the practice is often very different: The users keep adjusting the proposals. In part, this is unavoidable, since most companies are troubled with disruptions which cannot be considered in the material planning proposals. Sometimes, the material planning proposals the system delivers could be improved by setting the master data and system parameters according to the situation. And sometimes the planners trust their intuition more than they trust the system.

The overstraining maintenance of the ERP master data:

$$1000\ items * 10\ master\ data$$
$$\downarrow$$
$$10.000\ data\ fields * 60\ sec$$
$$\downarrow$$
$$166.6\ h * 2\ per\ year$$
$$\downarrow$$
$$333\ h\ per\ year$$

Blaming the users for incorrect master data and system parameters is easy. They, however, are either hopelessly overstrained concerning time and knowledge to adjust the settings correctly. A simple calculation shows the impossibility of a thorough maintenance of the master data by the users:

Even if you limit the maintenance to the essential parameters of each item, you still have eight to ten values to set (replenishment time, minimum lot size, production lot size, minimum stock, incoming goods processing time, lead time, safety time, material planning procedure, lot size procedure, planning value distribution, allocation intervals, required service level, material planning mode (auto, manual), …). We are already supposing that forecasting procedure and safety stock procedure are already determined by the system, as is the intricate quantity of safety stock. If one material planner is responsible for 1.000 items, this makes 10.000 data fields which need to be maintained and

possibly adjusted at least twice a year. If we assume that opening, checking, processing, calculating and possibly adjusting takes one minute per data field, that makes 20.000 minutes of effort. Which is about two man-months per year. If the planner has 3.000 items to look after, this would make half a man-year of annual maintenance and if maintenance is due every quarter, you will need to fill one full-time position with maintenance of data only.

Additionally, the interaction of the individual parameters is highly complex, which makes it very difficult for the user to find the economically best settings without further help or aid. And lastly, many users adjust the material planning proposals because they trust their instincts more than they trust the system.

Hence, a company which strives for a successful inventory management need to solve these problems and implement an efficient and effective material planning:

Best practice step 4:

Sustainable inventory management requires reproducible and economic material planning decisions. These can only be made, if rule sets and simulation mechanisms grant the correct setting of procedures, parameters and master data for each situation and replace the users' instincts.

Subjective decisions, driven by instinct, are also a main cause of the often felt stress in the supply chain. This is because we often react to harshly to fluctuations in demand in the value chain, which causes major struggle with the effects of

Basic principle 5: The hectic reaction to fluctuations in demand and supply

…causes the supply chain to swing.

Everyone who has ever navigated a yacht knows this effect: A big yacht reacts rather hesitantly to the movement of the rudder. Many inexperienced sailors try to accelerate the change of course by moving the rudder more violently, which only helps a little and has the side effect of oversteering. The yacht now turns too far to the other side, which causes it to react even less to the movement of the rudder in the other direction. As a result, the ship does not sail a straight course, but rather in a zigzag course.

We have recognised the same effect in inventory management. Very often, the reaction to item related excess stock or stock out is far too hectic and violent. When the now increased stream of incoming goods reaches the warehouse, one tries to decrease it by drastically reducing the order quantities - and so restarts this cycle.

Sticking to our sailing analogy, the best method to buffer fluctuations in demand are subtle reactions. With living articles, inventory fluctuations usually are caused by demand fluctuations of the previous value chain points. Sensible reactions would hence be:

- buffering increasing demands by safety stocks
- communicating a decrease in demand within the company consequently and immediately
- reordering a little less than the initial increase in demand suggests or
- reducing stock a little less than the initial decrease in demand suggests.

Unfortunately, another truth from the sailing experience may be applied to inventory management: There are sailors, who know how to man the helm in a very short period and there are others, who never really learn it. In our experience, it is the same with inventory management. Thus, while the autopilot may assist in manning the helm on a yacht – and is often enough much better at it – the rule set may do so in inventory management.

Rash reactions may improve your own inventory management for a brief period, but the fluctuations resulting from them will spread across the entire, interlinked supply chain – and hit your company in the back. In the big picture, everybody pays the costs of the supply chain, which means everybody experiences the rising costs.

Hence it is very important to realise:

Best practice step 5:

The effective stability control (ESC) of a sustainable inventory management consists of short cycle, yet moderate reactions to fluctuations in demand, supply or production.

Not only do inappropriate material planning rules and mechanisms as well as subjective decisions and rash oversteering raise the inventory levels, the wrong de-linking in material planning between stock and material planning levels does so, too. Which is a very intricate subject.

Looking at the distribution from central warehouses over possible regional warehouses to possible stores or even further down to 'points of sale', many companies still work with material planning levels which have different concepts and/or different staff. Each head of each warehouse has their own strategy, each store manager decides when to replenish what. But this is the first step to anarchy in material planning.

Basic principle 6: Individual decisions in internal or external distribution chains

…will cause the flow of goods to overflow.

In case you have never heard of the 'beer game', you should really try it out. In this business game, the supply chain of a brewery, starting with the brewery, going over to the distributor, a wholesale and finally the customer, is laid out. In each round, the different inventory levels must be stocked appropriately with beer crates to ensure high service levels whilst keeping the inventory levels low.

Every inventory level only knows the actual sales orders and thus decides individually how much to reorder from their supplier. Watching the quantities of material planning and inventory build each other up is intriguing and funny at the same time.

This 'beer game' is adequate to the typical strategy of a delivery chain in which every inventory level may act in economic independence and at its own responsibility. Concepts like „Forward Sourcing", Efficient Consumer Response (ECR) or Collaborative Planning, Forecasting and Replenishment (CPFR) are trying to harness these planning chains.

But this proves to be difficult since the independent parties have their own interests and egos in mind rather than obeying to one master or at least cooperate. Yet many companies do have that

'common master', the head of the distribution chain, who consolidates the individual behaviour into one stringent result for the company.

At least in this kind of distribution chain the arbitrary behaviour can be controlled and the top performers in inventory management do so. They achieve this result by a central control of the replenishment across the different inventory levels, which is based on an intricate and permanently optimised rule set.

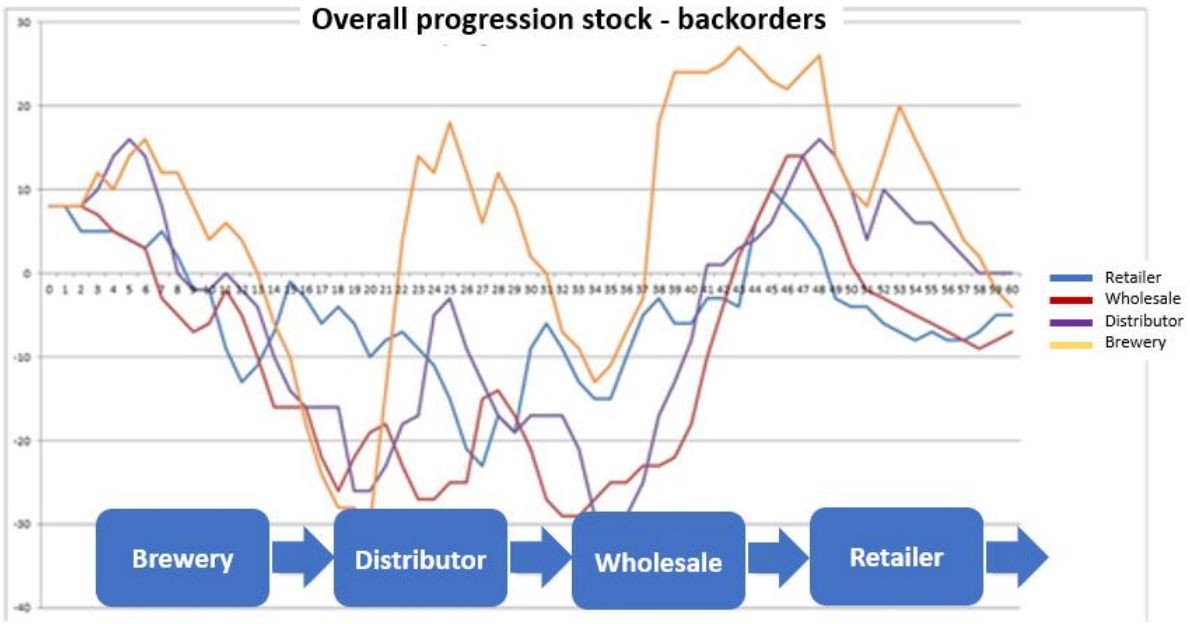

Image 3: The oversteering of the distribution chain in a beer game (business game)

Frequently, the individual warehouses along the distribution chain are legal independent units, which also bear the responsibility for their results themselves. Consequently, these warehouses claim the material planning of their own inventory to be their sovereign right and a matter of competition: "If I am to be held responsible for the results of this subsidiary, then I must also be free to plan the materials in my warehouse as I choose", is the typical reaction to the suggestion to implement centralised replenishment. Reality shows, however, that overall less stock, distributed across the correct items, increases the performance. The availability of material for each stock level can be granted by delivery service contracts between the stock levels and the central material planning. Yet this must be supported by the disciplined exception planning of projects, sales deals or other exceptional demands.

Best practice step 6:

A sustainable inventory management across the distribution chain can mostly be achieved by a centralised replenishment. The responsibility for exception planning and delivery service agreements replaces the responsibility for the local inventory of externally scheduled inventory levels.

Distribution relations, which connect different stock levels by means of transport, are not the only components of a supply chain. The longterm purchase relations between a client and a supplier are

also a part of it. In these cases, the logistic process consists of more than a relocation contact between the finished goods stock of the supplier and the incoming goods warehouse of the client. Maybe, the supplier does not store the ordered part as a finished good; still, the stock from which the customer's order must be dispatched, will be replenished by production.

Lean management often suggests producing in sync with the customer in these cases, which means to link both production stages regarding time and quantity.

Given the proper requirements, this approach works very well, as we will see. In many cases, however, you will be wasting the opportunity for inventory reduction and operating efficiency, since you better mind

Basic principle 7: A company's logistic system operates in its own unique rhythm.

From the perspective of inventory management, the cooperation between client and supplier offers a significant potential for the reduction of stock and the improvement of security of supply. The possibilities start at the product specification of designed components across the avoiding of stock levels to the administrative integration.

To synchronise your own production may be an effective approach to level material streams and thus simplify inventory management. Adapting to the customer's timing however, may be too simple to be adequate, since the supplier's production chain is often not specifically designed to match the client's production chain. Or, to use another analogy: Running with a partner may not always be profitable, since every runner needs to adapt his rhythm and pace to his own constitution.

While the synchronicity in the supplier's and the customer's production may be one kind of cooperation, there is another way, too: The supplier must react to a customer's or-der immediately to keep the agreed delivery date.

In long-term business relations and regular delivery, the de-linking of supplier and customer may offer a large economic potential. It may prove to be more economic and an improvement of inventory levels if you are producing in your own rhythm or implement a buffer stock to emancipate yourself from the client. The classical stock of finished goods may help with de-linking, too, but usually requires more inventory. The VMA (Vendor Managed Inventory) concept is a more refined and very efficient tool for de-linking.

The typical VMI mode allows the supplier to independently replenish the customer's stock. The customer is relieved of the material planning, the supplier gains more freedom of his own material planning, since he can decide whether he provides the subsequent delivery on a certain date and in a certain quantity more independently. The supplier bears the capital commitment of the stocks at the customer's site, the customer takes care of storage and maintenance – and usually also the economic risk. VMI concepts are thus not exactly to the supplier's disadvantage, yet many still reject them.

It is a lot different, however, if the production chain of the supplier is specifically de-signed to match the customer's production. This is very often the case with batch production and mostly in automotive industries. In this case, the close cooperation has more advantages since it is part of the production chain's design. If the customer's and the supplier's production are in sync and very stable,

just-in-time (JIT) or just-in-sequence (JIS) provide high service levels at low stock levels. The supplier thus surrenders the lean management's holy grail of pull regulation to a precise push regulation, which allows materials to come in just in the right moment.

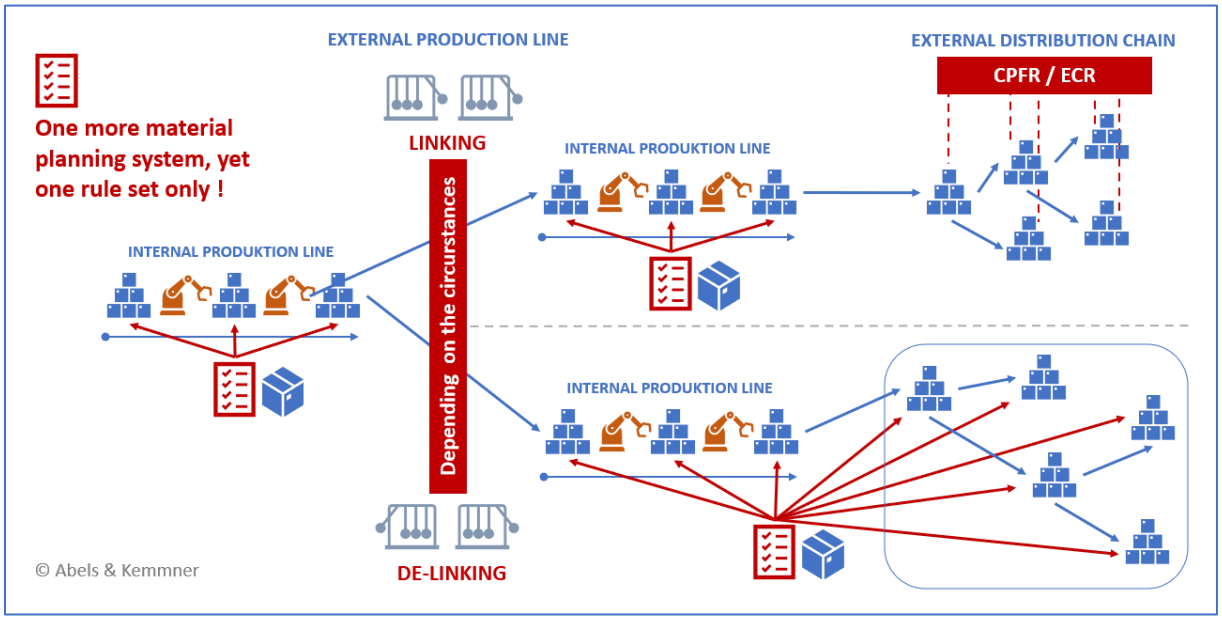

Image 4: The material planning levels of the distribution chain and between economically connected companies should always be synchronised by a central rule set.

Best practice step 7:

In the production chain of economically independent companies, inventory, service levels and operating efficiency can best be improved by de-linking the individual parties' production. In the special case of exactly synchronised production lines, however, the connection principles of an internal production chain apply.

As previously discussed, a synchronised production of internal production chains and external production processes specifically designed for synchronicity offers many advantages concerning the production's operating efficiency and the inventory management. Unfortunately, items with large lot sizes and long cycle times get in the way…

Basic principle 8: Items with large lot sizes and long cycle and delivery periods

… are junk food for the supply chain: Cheap to buy, but hard to digest.

Who of us does not cooperate with Asian suppliers? Many products can purchase exclusively in Asia, while others are simply much more cost efficient if purchased in Asia. The Asian Sourcing, however, does have its difficulties. For instance, there are not so rare cases, in which the price advantages of an Asian supplier are already consumed by the travelling expenses of the purchasers. But the more influential effect on logistics is the longer delivery period and the larger lot size, whether this is caused by minimum order quantities, optimisation of freight charges or the requirement to fill containers.

Items of large lot size and long replenishment time keep causing high fluctuations in stock as well as large average stocks. In the average, the large lot size has a much heavier impact than the long replenishment time. If the replenishment time doubles, the stocking up period does not necessarily need to increase as well. The required safety stock, however, increases by approximately 40%. The doubling of the lot size, in the opposite, also doubles the basic demand. The more irregular the demand for this item is, the more the effect of safety stocks shows; the more regular the demand, the more the basic demand changes.

If not only purchase, but also production works in large lots, the material runs in big waves through the production lines. This increases the possibility of temporary capacity shortages, which slowly progress through the supply chain like a rat through a snake. But this kind of obstruction directly increases the production's quantity of work in progress.

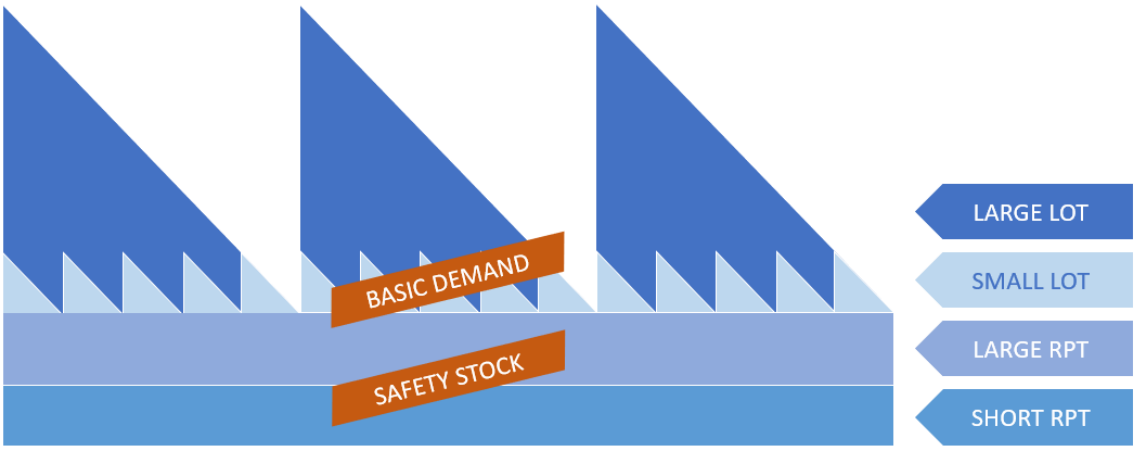

Image 5: The smaller purchase and production lot sizes are, the more evenly the material streams. The shorter the replenishment time, the smaller the safety stock.

Of course, it is impossible to reduce production and purchase lot size as much as you want, since you must consider the overall costs as well, but then please do consider the overall costs - and not just the purchase price. There is an enormous difference between an inventory management and a logistic strategy, which are aimed at the continuous reduction of lot sizes and replenishment times and those, which regard those two parameters as a given fact. This is where the top performers in inventory management outperform the other companies: The first-class companies always try to grind their material stream to finer bits, so it can flow much more and easier (regarding the correlation between process time to cycle time). The higher the flow rate, the more even the material stream and the lesser the quantities of stock and work in progress.

Best practice step 8:

A sustainable inventory management requires a fine material mix of small production and purchase lots and short replenishment periods.

In every delivery correlation, whether material planning is not linked or it is linked by a central material planning rule set, shortages may appear every now and then. If material planning is not linked, then the following applies:

Basic principle 9: If there is a shortage of daily demanded goods,

… which practically means all b2b goods, the demand overreacts first.

We have all seen this in the grocery stores: Imminent storms or longer holidays may cause customers to start hoarding. Yet this is only temporary. However, this is also true in the industrial supply chain, if shortages are only temporary. It is very different if the shortage stays for a longer period and the customers cannot find replacements.

Many suppliers, who cannot fulfil the market's demand for such irreplaceable items, naturally start dispatching short delivery to their clients. This helps to improve the situation drastically, if the shortage is only temporary, since the missing quantities will be delivered soon. If the shortage lasts longer, typically for several months, the supplier will never be able to fulfil his clients demands at all. From the client's perspective, this situation is a quota system and some suppliers apply this system to shortages.

A quick example: The customer has ordered 1.000 pieces and gets 200 instead. The customer will then just apply the rule of proportion and order 5.000 pieces when he needs 1.000. You can imagine the chaos this caused, if every customer reacted like this – and many do react like this.

It is not so easy for the purchaser to put his company's advantage behind those of the less savvy competitors. But in consequence, the supposed market demands build each other up, even though they are not real. The semi-conductor industry is very familiar with such cycles. In the worst case, they make the supplier increase their capacity drastically. But as soon as the real demands are fulfilled due to the increased production capacity, the false increase in demand collapses. Before that happens, however, many customers have been drowned in incoming goods.

The solution to this kind of longterm shortages is quite clear, but it requires consequent application: Applying the quota system to the customer's delivery is correct, yet only if it is based on the past orders of the preshortage time and not on the actual order. If this procedure is made clear to all clients, there is no more reason for the inflation of order quantities and the imminent hog cycle will be softened.

Best practice step 9:

If long-term shortages appear, the deliveries to the customers must be quoted, based on the delivery quantities of the past.

The supply chain relationship between supplier and client is unfortunately not only disturbed by exceptional situations like longterm delivery shortages, but also by the be-haviour of the (supposed?) partners in the daily routine, see…

Basic principle 10: When purchase and sales meet,

… tactics and infighting often matter more than constructive cooperation.

Naturally, purchase is always trying to achieve the best prices for the products and qualities its company needs. It is just as natural, that sales is doing its best to achieve the highest possible prices for the products and quality its company offers. Hence, we all know what is happening when the client's purchaser meets the supplier's sales person: Each party will do their best to negotiate to their own advantage and use their bargaining power. If one party has more bargaining power than the other, it often gets very ugly. But even equal negotiation partners frequently try to either seek the other's mistake or hide their own, to have a more powerful position next time. This behaviour is even more distinct, the more purchase and sales are also responsible for the current day-to-day routine. There is much more cooperation if material planning negotiates with material planning and logistics with logistics. This way, many coordinative problems can be resolved by communicating on equal work levels before they become conflicts on the managerial level and cause increasing inventory.

Best practice step 10:

A sustainable effective inventory management requires a factual cooperation between the central suppliers, where the supply chain's costs are split evenly between the parties.

If we look beyond the dock doors onto the multitude of products in our stocks of raw material, half-finished parts and finished goods, we can easily see…

Basic principle 11: The slow-movers in the product range

… make most of the inventory, but less turnover and the least yield.

The product range of make-to-stock producers typically has 20 to 30% of items which yield 60 to 80% of the turnover (A-B/X-Y items), while it also contains 20 to 40% of items which make merely 2 to 3% of turnover (C/Z-Z2 items). In contrary to fast-moving items, which have inventory turnover rates of 12 – 24, most of the slow- or non-moving articles do not even turn once a year. This long tail of slow movers, however, must be scheduled, maintained, and stored, too.

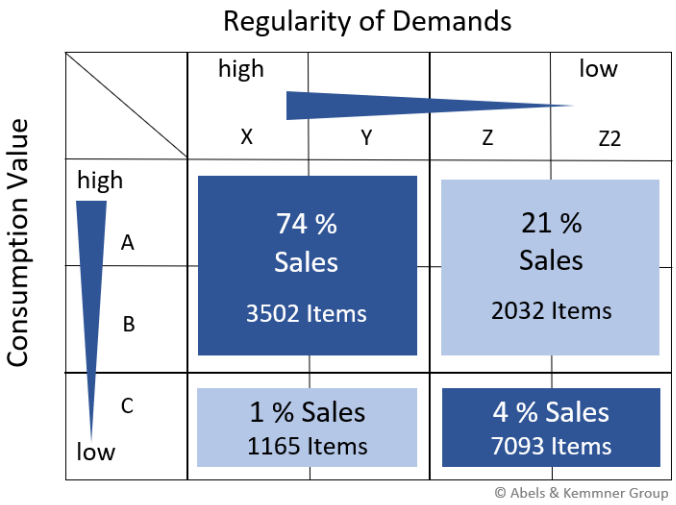

Image 6: Example of a typical ABC-/XYZ product range ratio

If this long tail is purchased order-relatedly, it will not worry the inventory management. Yet, often enough, the order-related purchase is impossible due to several reasons. It is then required to find sensible strategies to reduce stocks and handling effort.

Contract manufacturers often suffer from the same product range ratio, even though theirs is on the level of purchase or assembly parts. One solution lies in short manufacturing cycles or replenishment times for these slow-moving items or the management of C items. Although this is primarily focused on C/X-Y items, it can ensure short replenishment times for C/Z-Z2 items. Most of these C/Z-Z2 items, however, consists of designed parts, which cannot be handled by the management of C items.

The long tails of a company's product range have a history which begins, like all tales, at the beginning. In a product or assembly part this means to find or suggest a solution, the market will be interested in. To offer the solution, varieties will be split up or new parts or products will be developed. Of course, anyone will build up stocks of a new part to ensure high service levels and thus give it a chance on the market. If the product fails to take its chance, it should consequently be removed from the product range. So, from the logistical perspective, there is a lot of optimisation potential in a product range, equally for a living, a new or a fading-out product.

Best practice step 11:

To keep inventory levels low sustainably, the regular maintenance of the product range is inevitable.

Each product or assembly part has a prequel to its history: the product development and design. This initial point sets the challenge inventory management must face in the future, since…

Basic principle 12: Most of a part's costs is already determined during its development.

From extensive experience we know that in the development of a product 80% of its life cycle costs are already determined. Which is why product development has such a various and strong influence on the carrying costs and the prospectively required stocks of each part.

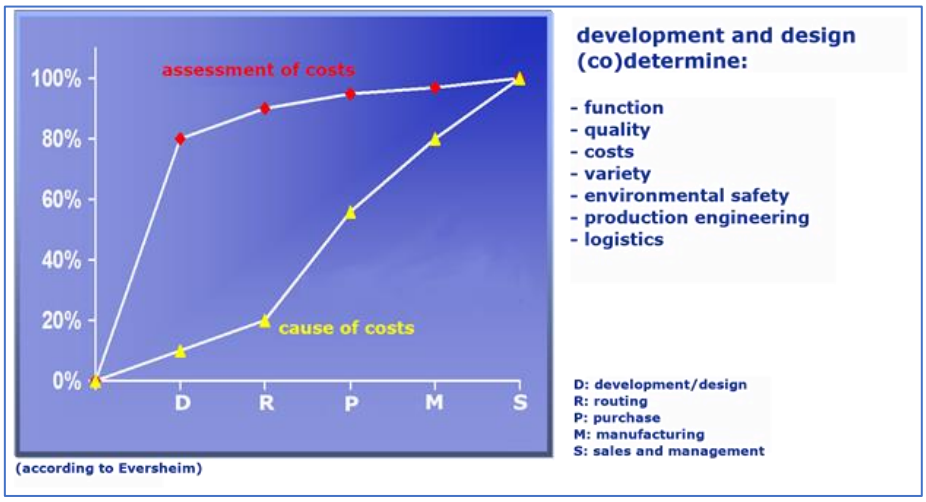

Image 7: The majority of an item's carrying costs is determined during its development.

The choice of raw materials and the production methods and steps resulting from the design influence the lead time, purchase price and purchase and production costs. Which also influence the inventory costs and the service level. The amount of parts, which are part of the production process, multiply these effects. Additionally, most items are altered into different variants during their life cycle, which causes their material flow to split up at an early stage of the supply chain. And this multiplies the effects mentioned before as well.

Therefore, to start right at product design means to pull a big lever - which also happens to be a heavy and cumbersome one, too.

Best practice step 12:

To rise to the top of leading inventory managers, you must design your products also regarding the logistical aspects of production. Your items should consist of only few parts, a high percentage of standard parts and varieties should appear at the latest possible stage of the supply chain. If possible, at the customer's site.

At the end of our journey to a sustainable and holistic inventory management, we must not omit one essential basic principle:

Basic principle 13: Everything starts with trust, but inventory management ends with it

Most people conform to society's rules and laws, at least that is what Police Crime Statistics as well as private and business experience tell us. And yet, as we all also have experienced, the obedience may fade fast if it is not continuously demanded and supervised. Especially, if the rules do not seem to make sense or feel like a disadvantage. Consequently, in inventory management well measured supervision is better than measureless trust.

Average sim. stock	738.95
Average sim. stock	24,015.88
Stock reduction	419.95
Stock reduction	13,648.38
Achieved service level	98.40%

Image 8: Example of the key figure "stock reduction" in the context of required stock management (Source: DISKOVER SCO)

Logistic controlling is a good aid for evaluating the situation and finding measures for optimisation.

One powerful means of control is the implementation of a required stock management. This tool allows the continuous supervision of each item's current stock on each stock level along the supply chain and its deviation from the required stock.

To ensure realistic and not merely theoretical required stocks, a range of sophisticated tools is needed, since reliable required stocks can only be determined by a simulation process rather than by a sharp look at the material planning list in a scheduling system.

The core of required stock management is the key figure called “stock reduction potential”, which is determined for each material number. The stock reduction potential indicates where either too little or too much stock is stored and thus helps operative users and stock managers in their daily task of keeping the inventory management on course.

Best practice step 13:

In inventory management, a consequent required stock management is equivalent to the lane assist in a car. It alerts users, when they leave the assigned course and indicates to supervisors, where they must take how much action.

Inventory management is a holistic task. To see lasting results, you will need stamina as much as the appropriate tools and methods.

Perhaps most of the introduced best practice steps are already part of your inventory management. Or maybe, there is still a long road ahead of you. Yet this is an effort which will show its yields in the end, as a stock reduction of 20% will increase the net profit of your company as much as increasing your turnover by approx. 10%.

20% of stock reduction will increase the net profit of an average company as much as increasing its turnover by 10%.

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