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Vendor Managed Inventory – New Vistas towards Inventory Optimization in Retail Business

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ABSTRACT: Outsourcing is expanding from parts and components to include services and process management. The question is no more just who designs and manufactures the goods, but also who manages the logistical processes along the supply chain. In this paper, we argue that this approach to outsourcing provides new opportunities for those retailing and grocery sectors that traditionally have not considered outsourcing as a strategic option to develop their operations. Retailers, especially supermarkets, are managing an increasing number of product categories and stock keeping units that have forced them to develop their replenishment practices in order to minimize out-of-stock problems. This paper examines the options open to the grocery retailing industry that will enable it to attack the problem through outsourcing. A new process innovation, vendor managed category management, is proposed. A potential application is presented by means of one real-life case, in which a distributor offers the retailers full management of one categorythatincludesassortmentformingandlogisti calfunctions.r 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Category management; Outsourcing; Supply chains; Grocery retailing; VMI

I. PREAMBLE

Outsourcing has widely been considered as one of the major means of improving both the competitiveness and effectiveness of companies. Focusing on core competencies and outsourcing the rest to specialised suppliers has been the trend for decades, especially in manufacturing industries. Recent studies (ELA, 1999; PriceWaterHouseCoopers, 1998) indicate that the role of outsourcing is going through major changes. Out- sourcing is not just buying single functions or parts and components from outside suppliers; it is about reconfi- guringwholeprocessesinnewways.Thischangeaff ects logistics in particular, where the need for process integration is a challenge that calls for new ways to share responsibilities among supply chainpartners.

The vendor managed inventory (VMI) concept is a good example of an innovative way of using outsourcing in process reengineering. VMI is an operating model in which the supplier takes responsibility for the inventory of its customer. In a VMI partnership, the supplier makes the main inventory replenishment decisions on behalf of the customer. The supplier, which may be a manufacturer, reseller or distributor, monitors the buyer's inventory levels and makes supply decisions regarding order quantities, shipping and timing (Waller et al., 1999). However, VMI has not gained widespread acceptance in the grocery supply chain. It requires allthe co-operating parties to use similar protocols and common product numbering. This has slowed down the adoption of VMI, especially in the grocery sector, where large stock keeping unit (SKU) numbers and frequent transactions make implementing VMI more demanding.

Traditionally, outsourcing has mostly influenced manufacturing industry, while retailers are still trying to manage an increasing product range by themselves. An interview study in Europe (van Hoek, 1999) revealed that in food supply chains outsourcing is applied to a lesser extent than in other industries. The scope of outsourcing activities is confined to warehousing and shipment. There are a few examples of outsourcingsome minor product categories, but in these examples out- sourcing seems to be mostly ad hoc, without an overall strategy.

For identifying what could be the core competencies for a retailer and subsystems to be outsourced, we applied the modular product design principle of manufacturing industry (Sanchez, 1996). The retail product is the store outlet, which comprises store location, layout, assortment and looks, as well as marketing functions like product presentation, pricing strategies and services. The store as a whole is

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the offering to the consumers. In a retail store, modules that can be outsourced are the categories. An excellent basis for identifying core categories is formed by efficient consumer response (ECR) work in companies, since ECR has sharpened the role and management of product categories in the grocery retailing business (www.ecrnet.com). This is very important when im- plementing outsourcing in aretailing environment.

The body of knowledge that serves as the basis for this paper consists of the principles of category manage- ment of the ECR concept, outsourcing principles from manufacturing industries, and the concept VMI as an example of process reengineering. The case study illustrates the synergies of combining these approaches in a retailer–wholesaler–manufacturer sup- plychain.

II. BODY OF KNOWLEDGE

1.1. Category management inretailing

ECR is an attempt to manage the challenges presented by the retail industry. ECR aims to develop the supply chain as a whole and eliminate non-value- added functions. The key elements of ECR are efficient replenishment, efficient assortment, efficient product introduction and efficient promotion. These are the means with which to attack the major problems in retail stores, namely out-of-stock and over-stock (Kotzab, 1999,www.ecrnet.fi).

Implementing ECR principles means dramatic changes in current business practices. Trading partners are asked to develop their business processes together in order to increase value for the consumer. By demon- strating their superior ability in working with trading partners, the companies are able to add value for the consumer, which is a competitive advantage for this supply chain(www.ecrnet.fi).

Though successful ECR implementations exist, adopting the principles of ECR widely has not been easy. The concept is complex and extensive, which makes implementation difficult for companies. To fully adopt ECR, a company should change operations, starting from the strategic level and continuing to marketing, logistics and financial functions. In the grocerysupplychain,thebestresultshavebeenachieved between the supplier and the distribution centre. At the retail end of the supply chain, which is the initial focus of the concept, the results have been modest (Mitchell, 1997; Hill, 1997). In practice, the implementation of ECR practices takes place slowly step-by-step, and the savings are also gained slowly. The implementation often starts in operational activities where the savings are realised faster, but the real promise of the concept is in marketing and category management (Mitchell, 1997).

The goal of category management is to optimise assortments, promotions and product introductions, as well as consumer value creation. Category management is said to improve revenue creation, but it also aims to reducecosts.Anexampleofasuccessfulimplementation is a Colgate-Palmolive project, where SKU count was reduced by 25%, the retailers' market share rose by 11% and margins went up by 9% (Mitchell, 1998). By category management, the number of SKUs are reduced, which helps in the more efficient performance of many tasks. Costs are reduced in inventories, for example, and in ordering andhandling.

The category management process is carried out through a multistage process, which consists of defining the category and its role, establishing the measures for the performance of the category, determining the strategies and tactics and implementing them (Mitchell, 1998). The process is also described by ECR Europe asa roadmap, to make adoption of the process easier for companies. An important part of category management is assortment forming, which is included in the tactical part of the process. In this part, the number of SKUs included in the category are defined according to consumer needs. The basic idea is that the consumer needs and category objects can be met with less product variants by eliminating those SKUs that do not provide variety or consumer value in the category. This has impacts on the whole supply chain, for example, capital tied up in stocks, warehouse space, physical distribution costs and manufacturing and raw material costs

To sum up, category management brings tools and guidelines for promotion, new product introduction and assortment forming. The management of these issues is becoming more and more important, since the SKU count in grocery products is growing all the time, product life cycles are shortening and, furthermore, the change rate is accelerating. The major challenge is to operationalise the ECR guidelines, which often seems to remain at the marketing or conceptual level. However, category management work forms a basis for the vendor managed category management (VMCM) concept pre- sented in this article. Category

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management clarifies the roles of categories in the retail store and therefore offers tools for identifying the core functions to be managed internally and also non-core categories, the management of which can be bought outside.

1.2. Vendor managedinventory

VMI is an operating model in which the supplier takes responsibility for the inventory of its customer. In a VMI-partnership the supplier makes the main inventory replenishment decisions for the customer. The supplier, which may be a manufacturer, reseller or a distributor, monitors the buyer's inventory levels and makes supply decisions regarding order quantities, shipping and timing (Waller et al.,1999).

For suppliers, the major attraction of VMI is in smoothing demand. Large, infrequent orders from customers force suppliers to maintain inventories that enable them to respond to the uneven demand. In VMI, the supplier is able to smooth the peaks and valleys in the flow of goods, and therefore to keep smaller buffers of capacity and inventory. The supplier has better opportunities to co-ordinate the shipments to different customers. It can schedule—either postpone or ad- vance—shipments according to production schedules, customer inventory situations and transportation capa- city. Usually in VMI the frequency of shipments is increased (Waller et al., 1999; Cottrill,1997).

Buyers need not monitor the supplier performance by the service level provided by the supplier to the buyer. The only meaningful service level is from the retailer to its customers, which measures the performance of the supply chain as a whole. The supplier's performance should be measured by this service level and by the inventory level at the retailer. Due to the supplier's abilities to plan operations better and due to more frequent deliveries, the service level improves. This generates more sales, because product availability increases. This is especially important in promotions (Waller et al.,1999).

Successful VMI implementations in retailing can be found in the apparel industry. For example, VF Corporation increased sales of men's jeans by 20% by adopting a replenishment system based on point-of-sales data and VMI principles with its retail customers. Especially in the apparel industry, store availability is essential, since a customer who can't find their required size in the store is a lost customer (Anonymous, 1998). Also in the grocery sector, VMI is adopted successfully, for example between Procter & Gamble and Wal-Mart (Cottrill,1997).Holmstrom,(1998a,b)hasdescribed a successful European grocery VMI case.

However, VMI has not gained large acceptance in the grocery supply chain. In a VMI relationship, the co- operating parties must use the same protocols and common product numbering. This has slowed down the adoption of VMI in this sector, where large SKU numbers and frequent transactions make implementing VMI more demanding. Also, the customers are reluctant to abandon purchasing, which may be regarded as a core competency of thecompany.

1.3. Outsourcing

1.3.1. Outsourcing in manufacturingindustries

In manufacturing industry, focusing on the core business and outsourcing the rest has been one of the most central guidelines for a long time (Womack, 1990; Dobler and Burt, 1996). When Henry Ford started the model-T Ford production in the beginning of the 20th century, everything was manufactured in a huge factory area that had iron ore processing at one end and the finished cars emerging from the other end. Along with technological development, increasing customer require- ments and increasing competition, the cars soon became more complex and required the continuous development of many technologies. Therefore, the automotive man- ufacturers came to a point at which make or buy decisions had to be made. They started to buy more raw materials and parts from specialised suppliers. The outsourcing trend concerned not just materials and parts. Such companies have also increasingly outsourced services, of which logistical services and product development have been the most important. Some suppliers, for example seat manufacturers, started to deliver ready-made subassemblies directly to the auto- motive manufacturer's assembly line. Some suppliers have total responsibility for the development and manufacture of the entire system, for example electrical harness and brakingsystems.

To enable efficient outsourcing practices, the original equipment manufacturers (OEMs) have adopted mod- ular product design techniques. The end product has been divided into modules that can be outsourced and efficiently assembled in the OEM's factory. The OEM specifies only the quality requirements and the interfaces withothermodules,thesuppliersdotherest.

According to a recent survey (ELA, 1999), logistical services are also increasingly bought from third party logistics service

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providers. In addition to the traditional outsourced logistical activities, transportation and ware- housing, the use of value-added logistics services is increasing. The trend is catalysed by the better offerings of the service providers. They offer more value, more flexibility and more integrated services than internal sources can offer. The relationships are becoming strategic and collaborative. The service provider may take responsibility of a whole process, for example of a spare parts process, including planning, purchasing, inventory, distribution, transportation and customer support. This reduces the number of third-party logistics providers that customers have to deal with (Quinn, 1999; Burnson, 1999; Foster, 1999; Engardio, 1998).

The role of outsourcing has gone through a major change. According to a PriceWaterhouseCoopers study (1998), outsourcing had moved markedly from performing single functions more efficiently to reconfiguring whole processes in new ways. Rather than asking what our company could do, the question is: Why not outsource? The company should only perform those activities where they can develop best-in-world capabilities.

1.3.2. Outsourcing inretailing

When we take a look at the retailing industry, we cannot find an outsourcing trend similar to manufactur- ing industry. An interview study (van Hoek, 1999) confirms that in European grocery supply chains outsourcing is applied to a lesser extent than in other industries. Retailers are still trying to manage by themselves an ever-increasing product range. The out- sourcing scope is confined to warehousing and ship- ment. There are examples of outsourcing some functions inside the retail store concerning minor product categories, but it seems to be done without an out- sourcing strategy. The initiative has usually come from thesupplier'sside,whiletheretailerhasbeenthepassive party.

Dobler and Burt (1996) emphasise that a company should develop an outsourcing strategy. The company should identify its core competencies and maintain and build on them. The outsourcing strategy should be based on the strategic risk of outsourcing and the potential for competitive edge. Activities that have high outsourcing risk and high potential for competitive edge should be produced internally. Those activities in which both the risk and potential for competitive edge are moderate need moderate control and can be bought outside.

When we think about the outsourcing arguments from a retail industry viewpoint, the first consideration is whether or not they can be formed more efficiently by a global manufacturer. Even though there is a globalisa- tiontrendinretailing,itisstillarelativelylocalbusine ss. However, suppliers to the retailers are in many product categories globally operating companies and the com- petition is also global. The retailers could better utilise the capabilities and big resources of the global vendors. So far, the retailers have mostly compared the products and prices that they offer. When the outsourcing approach is applied, the viewpoint should be widened to business processes and service concepts (see, for example, May, 1998). Retailers should identify the activities that are performed more efficiently by the supplier than the retailer. In addition, these suppliers may be able to offer services that add value for retailers' customers. Also, the retailer should identify how the risks concerning delays and increased administration can beavoided.

The key element of forming an outsourcing strategy is the modular product design principle, which we adopted from manufacturing industry (Sanchez, 1996). Modu- larity is used for identifying what could be the core competencies for a retailer and subsystems to be outsourced.

III. RESEARCH QUESTIONS ANDAPPROACH

The environment in which retailers operate is operationally demanding. Single tasks in the process may be simple to perform, but they are repeated hundreds of times. This paper examines the possibilities to reduce this workload through outsourcing and by giving a supplier a stronger role in the replenishment process.

The objective of this paper is to develop new theory for outsourcing in retailing that answer the following questions:

1. How can retailers better manage the demand fulfil- ment process in thestore?
2. Does outsourcing enable more efficient implementa- tion of logistical processes upstream in retail supply chains?

The new theory is built by combining elements of the existing body of knowledge that were presented in the previous chapter, in a new, innovative way. From these elements we build a new concept for retail demand fulfilment, called VMCM. The concept combines the ideas

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of VMI, category management and outsourcing. Outsourcing ideas are adopted from the manufacturing industry, where the key for successful outsourcing is the modularity of products. A real-life case example of paper and office products category illustrates the principles of the new concept and the benefits from both the retailer's and supplier's points of view. A non- core product category was chosen as an example because the benefits of outsourcing are most obvious in such a category. For a retailer, it is expensive to maintain knowledge and skills to manage a minor product category, and the outsourcing risk is at its lowest in a non-core category. The applicability of the concept to other product categories is alsodiscussed.

In the next section, we first describe the problem of retailer demand fulfilment. Then we present the model for VMCM, a potential solution to the problem.

IV. BUILDING A MODEL FOR VENDOR MANAGED CATEGORY MANAGEMENT

4.1. Introduction

The current retailer demand fulfilment model in many European retail chains is based either on retail orders or on replenishment decisions made by the distributor and deliveries from distribution centres or directly from suppliers. The retailer demand is communicated to distributors or suppliers, who try to fulfil the need in the bestpossibleway.Theorderfulfilmentcycleisfast,since the order to delivery lead-time is typically less than 48h, or less than 24 h for fresh goods. InScandinavia, domestic dry foods and imported groceries are mostly delivered via wholesalers who run a distribution centre, and fresh foods like dairy, bakery and refined meat products are delivered directly from the manufacturers to the retailers as direct store deliveries (DSD). The direct store delivery suppliers also perform tasks inside the retail store, they work side-by-side with the retail personnel generating orders and shelving products. In Britain and Central Europe grocery distribution in more centralised and typically 80–95% of goods are delivered via distributioncentres.

The present model may appear to be efficient from the point of view of the retailer; the typical supermarket receives deliveries from a supplier several times a week, large hypermarkets even a delivery twice daily, and the order to delivery lead-time is short. However, there are several serious problems hidden in this demand fulfil- ment model.

First, the actual item level replenishment cycle can be far slower than the order fulfilment cycle. Despite of the advanced store systems, in many cases ordering is still based on perception. With 10,000 items or often much more in the range the retailer may have difficulties in managing the ordering process. An order may be placed too late, when the product is already sold out or will be out of stock before the delivery arrives. On the other hand, forecasting errors or price reductions connected to minimum lot sizes may lead to high inventory levels and obsolescence in the store.

Second, to be able to answer the service level requirements in the short order-to-delivery lead-time the distributor is forced to keep inventory levels high. There is little time to react to shortages once the retail orders have arrived and the distributor or supplier has to protect against uncertainty with inventories. Due to lack of visibility there exists accurate information neither about retail sales nor about out-of-stocks along the supply chain. Therefore, the supplier is not aware of the lost sales and the real trade-off between providing a goodlogisticsservicelevelandcostlevelremainshidden from thesupplier.

Third, the direct store delivery supplier's role is not clear. In Scandinavia, where these DSD suppliers have a strong position, the typical supermarket may get 50–70 deliveries a day. This causes traffic jams, ties up personnel and the limited space at the store's back door and makes store's internal traffic inefficient. Further- more, cross-docking benefits are lost in the supply chain (Kaipia, 1997). However, due to a better service level and fast deliveries, these product categories are most profitable to the retail store.

A major symptom of the problems of the current demand fulfilment model is the amount of out-of-stocks in the stores (Anonymous, 1996). Out-of-stocks cause lost sales of about 3% of total retail sales. It is often thought that these problems are caused by the dis- tributor's poorservice level. Surprisingly, asa US survey found out, 97% of the problems are caused by the retailer's operations and only 3% by the distributor (Fig.1).

Most problems are caused by the store ordering process for items supplied from stock by a distributor. Mostly, this is because the store personnel are not aware of current or potential stock-out situations caused by missing shelf tags or disorder in the shelves. Forecasting errors,

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especially in promotions, cause lost sales, as well as inadequate shelf capacity. Delays in stocking products to shelves are a reason for the rest of the lost sales (Anonymous,1996).

In direct store deliveries, ordering problems are the reason for 30% of out-of-stocks, while the delivery problems of the supplier are the reason for every fourth stock-out situation. Here, forecasting errors and deliver- ing less than ordered are the major reasons behind the problems (Anonymous, 1996).

The results of the out-of-stock study clearly indicate that further development of the warehouse and dis- tribution operations will not significantly improve the out-of-stock situation in retailing. Most problems are caused inside the store or in the replenishment process independent of whoever is the player taking care of ordering or replenishment. Thus, there still is develop- ment potential in the demand fulfilment models, as well as in the warehouse-to-store replenishment systems.

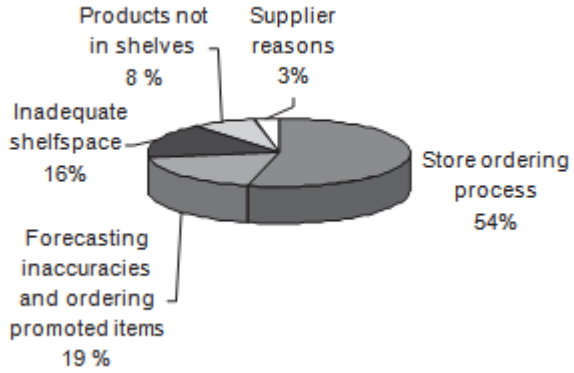

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Fig. 1. Reasons for out-of-stocks in a retail store of warehouse- supplied items (Anonymous,1996).

4.2. Building up a new concept—vendor managed categorymanagement

In building up our VMCM concept, we combine elements from ECR, VMI, and the outsourcing princi- ples of manufacturing industries. The first objective is to create a tool for effective management of a retail store that helps in developing and maintaining a competitive product assortment and reduces the risk of out-of- stocks. The second objective is to enable developing efficient supply chains from manufacturer to retailers. Fig.2 illustrates the main elements of VMCM.

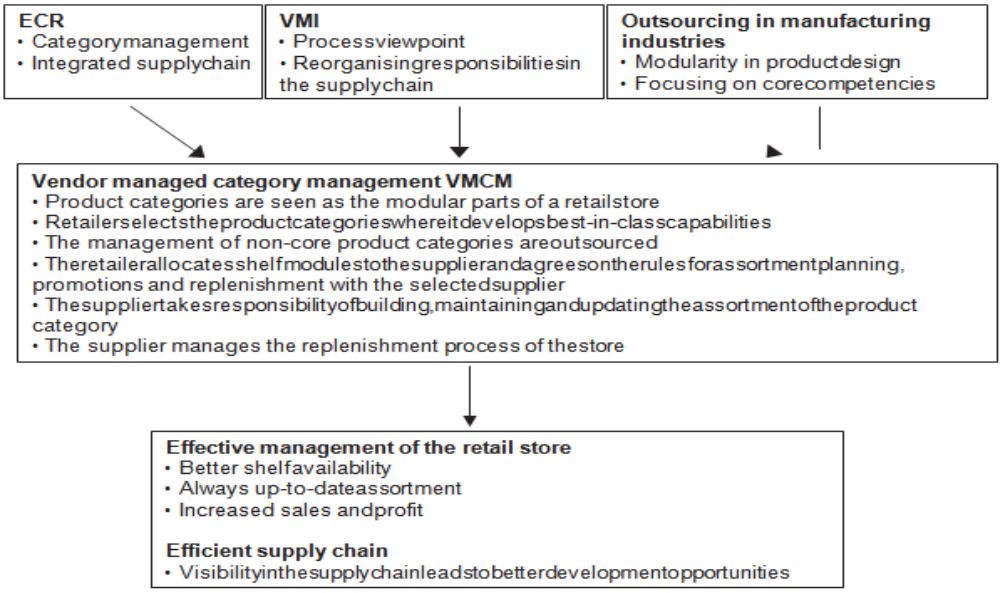

Fig. 2. The main elements of VMCM.

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As stated above, the idea of modular products as basis for outsourcing decisions is taken from manufacturing industries. In order to apply that idea to retailing we used the analogy that the retail product is the retail outlet. This retail product is the combination of retail type, whether it is, for example, a large supermarket or a discount store, outlet location, its layout, assortment and looks of the store. Also important are the presentation of products, pricing strategies and services. It is the store as a whole which is the offering to the consumers. In a retail store, the module that can be outsourced is the management of categories. Since ECR has sharpened the role and management of product categories in retailing business, it provides a valuable basis for identifying core and non-core categories. VMI provided the idea of outsourcing the management of logistical processes and reorganising the responsibilities in the supply chain. In the next section, we describe a case example that illustrates how the VMCM concept works inpractice.

V. CASE EXAMPLE:THE SUPPLIER MAKING AN OFFER TO CATEGORY MANAGEMENT

4.3. Description of the case

The case company manufactures school supplies and office products in Central Europe. In supermarkets, this is a non-core category, which makes outsourcing interesting in this case. This creates an attractive outsourcing situation because the retailer's main interest is in the more important product categories; minor categories do not attract the attention of the personnel. But, the manufacturer is obviously extremely interested in the success of the category in the retail store.

The company's products include categories like office supplies and school products, gifts and wrappings. The company is characterised by its comprehensive service offering, and offers tailored solutions for its retail customers, covering everything from planning of assort- ments and layout optimisation to full service category management and logistical operations. Distribution is carried out by subsidiaries or national companies. In Finland, a subsidiary takes care of the local operations. It is responsible for the management of the category of its customers and runs a warehouse to meet demand from local customers, who are mainly grocery retail chains.

The present operations model is based on a concept where the retailer has also outsourced the shelf manage- ment to the supplier. It makes a pre-agreed area of retail outlet available for the supplier and the supplier takes care of the rest. The 'rest' includes such tasks as the whole process of category management, including assortment decisions for different customer retail chains and shelf layout planning; ordering, replenishment and shelf work at the store. The supplier's role is not a typical direct store supplier's role, since it manages all theprocessesconcerningthecategory.Inshort,the company's value of fering is not to meet purchase orders from retailers, but tomeetend consumer demand in the category. This shop-in-shopconceptisalreadycommon in many brick-and-mortar department stores. The retailergivesthemanagementofthewholecategor yto one supplier, and avoids the costs associated with developing competencies in allcategories.

Inpracticetheprocessiscarriedoutasfollo ws.Thesupplier plans an assortment and the shelf layoutfortheretail chain for a 4-month sales period. There are certain rules to be followed in the process in addition toprofitability. For example, an assortmentmustalwaysinclude at least two variants of each product,evenwhensalesoftheothervariantisverysm all.Thisisbecausetheconsumerusuallywantstohav eachoicewhenbuyingaproduct,tobeabletocompare itwithothers.Inaddition,trendsandfadsimpacttheas sortment,especially in the school products sector.Butcertainbasic products must be in the assortment yearafteryear. In addition to the planning andcategorymanage-ment, the supplier's service offering coversthedailyoperations too. At the individual storelevel,salesrepresentativechecksttheshelfandm akestheplannedchanges in the layout. He places the products intheshelfand generates an order that is sent tothesupplier'sdistribution centre. From the distributioncentre,theproducts are delivered to the stores, so thatwhenthesales representative visits the store the next time, usuallythe next week or the week after that, he canputtheneeded products in the shelves. This demandfulfilmentmodel follows the principles of VMI,though nosophisticated IT-systems are used. Thesuppliertakesresponsibility for products being in stock andfor
minimising lost sales.

4.4. Benefits for the retailstore

To find out the benefits of the new system we interviewed department heads in

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charge of office products in four big supermarkets in Finland. Two supermarkets had outsourced the management of the office product category to the supplier, while two supermarkets managed it by themselves. The first benefit that was stated by both retailers was the simplicity and easiness of the concept. They said that the office product category was currently ''not at all laborious'', while the retailers that managed the category by themselves described it as ''really time consuming tinkering'' and ''problematic''. All department heads considered the product category very important for the supermarket, although it brings only a marginal share of the total sales. They stated that it is a very visible part of the supermarkets offering and has a big effect on the supermarket's serviceimage.

One explanation of the easiness of the VMCM conceptisthereducednumberofcontactsforthe retailer. Instead of tens of suppliers the retailer has to communicate with only one. Daily contacts are not needed. Only the agreement of the arrangement needs to be negotiated and it is naturally done for a longer period. The supplier delivers a 'shelf ready service' for the store. In a store with thousands of stock-keeping units, if the retail personnel take care of all of them, the process is similar to a car manufacturer taking care of the planning, manufacturing and assembly of every single component in the car. But, when the product can be divided into modules, whether it is a car seat or the management of a retail product category, the operation can be outsourced. Only the interface of the module with the rest of the product needstobedetermined.

The second benefit that was also stated by both of the department heads that had implemented VMCM was that the assortment is kept close to optimal when the supplier manages the store shelf. They stated that the category is currently ''orderly, always in right condi- tion''. The supplier takes care that the right products are displayed according to seasons, location, trends and storeimage. Because the supplierhasthebestknowledge of trends, for example in school supplies, where the fads clearly affect the demand, more sales are generated. The assortment is always updated, even in such a minor category, and more profits are generated, even though theretailerswerenotwillingtogiveexactfigures.

The third benefit is the better quality of the ordering process and inventory management. According to the out-of-stock study (Anonymous, 1996), store personnel are not very good at ordering. This showed very clearly in this case also. Both of the retailers that had outsourced the replenishment process stated that there are practically no stock-outs in this product category, while both retailers managing the replenishment process by themselves said that stock-outs are very common, especially during the high season periods. Nevertheless, the retailers that managed the category by themselves had allocated more shelf modules to this product category (8–13 modules) than the retailers that used outsourcing (5–8 modules). All in all, the retailers that had implemented VMCM could offer better assortment and better availability in less space than the retailers that managed the category bythemselves.

However, the retailer is not dependent on the supplier if something goes wrong. If a retailer outsourced the management of a category, it can set requirements for the service provider. The requirements may concern profit, sales or quality of operations. If the supplier fails to fulfil the expectations, the retailer has got alter- natives: it can give the business to another supplier or manage the categoryitself.

Therefore, by outsourcing the management of a non- core category the retailer is able to offer value to the consumer by satisfying their needs for products, convenience and lower prices. By letting the supplier takecareofthecategory,thestoregetstheefficiencies of category management concerning assortments, replen- ishment, promotions and product introductions, with- out contributing to the categoryitself.

4.5. How can the supplier benefit

In this section, we discuss the benefits of the VMCM concept from the supplier's viewpoint on the basis of the interviews with sales personnel of the supplier's country office. They stated that by offering full-service category management for retailers, they get a distribution chain for their products with a ready consumer interface. They have an opportunity to optimise the assortment and to introduce new products according to retail chains, locations and seasonal changes. They ensure the profit- ability of the assortment by continuously looking for ways to improve the category. They measure the success of individual items when forming the new assortments, for example by measuring sales in relation to the coverage of a product. Coverage is the figure that indicates how many stores have got a product item on display.

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The supplier has good possibilities to further develop the operations in the supply chain, because it manages the whole chain from manufacturing to consumers. One example of the development action is the replenishment cycle. The replenishment cycle in the case example is quite slow—it takes at least 1 week from inventory count to replenishing the shelf. The salesman monitors the inventory level once a week or every second week or at even longer intervals and the products are shelved on the next visit. In the worst case, if a product is sold out just after a salesman's visit, the item is not available for weeks. In addition, an analysis concerning the time consumption in the demand fulfilment process showed that significant slack time existed in the chain—about 10 days between the distributor and the manufacturer. This slack time is currently wasted before the distributor places an order. If the manufacturer could monitor the inventory levels in the distribution centre, it could use this 10-day visibility for better production and distribu- tion planning. In the interface between the retailer and the distribution centre there is a similar time buffer of 5–10 working days. By a more efficient information sharing process these slack times could be employed profitably.

To attack this problem the supplier is adopting new methods for replenishment. To utilise the slack time between retailer and distribution centre, better in-store inventory management is needed. The supplier is planning to utilise the point-of-sales data of the retailer to improve the timing of replenishments. The 1-week time delay between inventory count and replenishment could be eliminated, if replenishment decisions could be based on POS-data instead of a manual inventory count. Another potential use for the data is in order generation to the manufacturer: the stock position on the retail level is accumulated from the POS-data from retailers, and the replenishments of the shelves. This collaborative end-to-endsupplychainisshowninFig.3.

Also the distribution centre and the product manu- facturer can be closely integrated in the demand fulfilment model of the case company. The distribution centre today places orders to the manufacturer once a week based on forecasts and inventory levels. Adelivery from the manufacturer arrives 4 days from the order. Seasonal changes, trends, and campaigns make the forecasting difficult and the company has to keep inventories in the distribution centre to buffer against theuncertainty.

In the proposed supply chain, point-of-sales data can be communicated openly in the supply chain, not just to the next echelon, but all the way to the manufacturer. The manufacturer is able to base replenishments on the distributor's inventory levels and retail sales. The model is not new, there has been a lot of research concerning the benefits of better visibility in the supply chain recently. However, there are not many real-life imple- mentations where replenishments are based on retail sales in the whole supply chain, not to mention utilising this data in manufacturing. To succeed in utilising point-of-sales data upstream the supply chain requires close collaboration in the supply chain. In this case there are less constraints on the way to open information change, because the parties in the supply chain belong to the same company.

The supplier also benefits in operations planning. It has got access to consumer data and via the sophisti- cated category management process it can form fore- casts for the whole supply chain. Forecasts are needed in addition to the use of POS-data for preparing for volume and assortment changes in the distribution centre and in manufacturing. New product introduc- tions, campaigns and seasonal changes cause the need for forecasting. The process is carried out three times a year for a 4-month sales period, and is presented in Fig.4.

The last benefit for the supplier is the possibility of enlarging its offerings to electronic commerce. The supplier has got a ready concept and it can quite easily offer the service package via some e-retailer. The e-retailer would benefit, too, because it easily gets one whole category more for itsoffering.

Fig. 3. The collaborative supply chain, where the operations are based on consumer demand.

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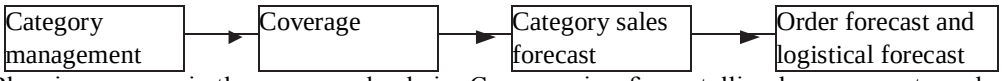

Fig. 4. Planning process in the case supply chain. Coverage is a figure telling how many stores have got a product in assortment.

4.6. Win–Win: benefits of the demand fulfilment model forboth

In this case the product category, which comprises mostly school and office supplies and drawing equip- ment, is a non-core category for the grocery retailer. If the retailer would take care of the management of this kind of category, it would have to decide on the assortment, deal with a number of suppliers concerning orders, invoicing and payments and plan the shelf layout. The store personnel would have to place the products in the shelves and follow and react to the trend changes and seasonal changes in the category. There is a possibility that the management of the category would fail, and the store personnel would concentrate on the more important categories generating more sales. The result would be that the sales and profits of the category would sink, and when reallocating the limited space in the store, the space of this category be given to more profitableproducts.

Now, when the supplier takes care of the category, the opposite happens. The sales and profits of the category rise, because the assortment contains the right products, which allows for the latest trends. The retailer gets more sales and profits in the limited retail space. The supplier in this case develops the operations in the supply chain further and ensures the competitiveness of its products and service offerings.

Through better information sharing and a collabora- tive planning process the time consumed in the supply chain, in the stores and by the distributor can be put to use. The economics of collaboration are realised in the form of lower inventories and more accurate planning results. Using better information-sharing capabilities of electronic commerce, POS-data can also be utilised to drive the whole chain. For example, in the case presented, the company's replenishments to the stores and to the distribution centre could be based on retail sales and on the inventory levels in the stores.

The new demand fulfilment model is based on outsourcing from the point of view of the retailer. The supplier takes care of deliveries, ordering and stocking, and above all category management. The retailer gives all the responsibility to the supplier and the supplier has the knowledge, ability and resources to perform all of these functions. The supplier also has the motivation to develop the functions further: to remove inefficiencies in the supply chain and to improve the relationship with the manufacturer by efficient information sharing and a quicker replenishmentcycle.

VI. DISCUSSION

In this section we discuss the research questions in the light of the results of the case.

1. How can retailers better manage the demand fulfilment process in thestore?

The case provides an example of successful out-sourcing of both category management and stockreplenishment processes, which we call VMCM. How-ever, outsourcing category management is not a solutionfor all categories. The supplier taking care of onecategory must be able to offer all products in thecategory, or be able to purchase some products outside, maybe from a competitor. In the case company this istrue. The company purchases some specific productsfrom local suppliers and adds them to the category. Thismay, however, be difficult in product categories wherethere are several competing strong brands. In thesesituations, a supplier may not be willing togive themanagement of the category to a competitor; the retailermust retain category management in its own hands. Therule in outsourcing is that non-core functions should bebought from a best-in-world source, but own capabil-ities should be developed and maintained in corefunctions and operations. In many categories the retaileris best placed to provide category management process.In order to identify the product categories that are theretailer's core competence and the categories that shouldbe outsourced, we propose that the outsourcing view-point is taken into account in planning the productcategories of the store. We see the situation similar tothe product design process in the manufacturingindustry, where modularity of the products is the basis for outsourcing also.

To develop an efficient outsourcing strategy, the retailers and retail chains should also consider their attitude towards the suppliers with direct deliveries. Retailers should

systematically agree upon the division of the responsibility of functions between the vendors and the retailers. Outsourcing seems not to be a systematically chosen strategy in grocery retailing, but has developed by evolution. Nevertheless, a part of retail operations has been carried out by suppliers for a long time. The role of suppliers with direct deliveries (DSD suppliers) is, however, not clear in thepresent replenishment model. On the one hand, retailers consider DSD suppliers as harmful. They see suppliers delivering directly to the retail store causing traffic jams at the store backdoor, creating paperwork, increasing the materials handling work, and store management fear lossofcontrolovertheDSDcategories(Lewis,1998) .In addition, the benefits of cross-docking and consolida- tion are lost for the distributor or wholesaler upstream in the supply chain. This is the case in Finland especially, where the DSD suppliers deliver about 60% of all goods to shops, which is a high figure compared to Western European or British retail chains (Kaipia, 1997).

On the other hand, a recent survey points out that DSD categories in the US generate 25% of store sales and contribute over 50% of the profit in only one-fifth of the store space (Lewis, 1998). The DSD suppliers generate higher productivity to the store by offering good service and less out-of-stocks, carrying out the category management process and adopting sophisti- cated replenishment methods, like continuous replen- ishment. The results indicate that DSD is a powerful weapon in increasing profits in the maturing retail industry (Lewis, 1998). Furthermore, the retail person- nel have usually nothing against a supplier taking care ofapartoftheirjobsuchasshelvingorordering.

Retailers should consider basing their outsourcing strategy on the DSD supplier performance. Modularity is the key. To be able to systematically and efficiently outsource some parts of the workload of a retail store, the retail store needs to be divided into modules. A clear identification of the tasks performed by the store personnel and by the supplier is then possible. In some categories this may mean a stronger grip and manage- ment by the retailer, while in other categories the whole category management process can be given to asupplier, ashasbeendescribedinthisarticle.

2. Does outsourcing enable more efficient implementationoflogisticalprocessesofretailsupplychains?

The case study also illustrated the potential to develop the management of the entire retailer-distributor/whole- saler-manufacturer supply chain. We may conclude that outsourcing and ECR are complementary for retailers in many ways. First, the category management principles of ECR provide a basis for dividing a retailer's business into core competence areas and outsourced modules. Second, by outsourcing the management of non-core categories retailers can focus on developing thelogistical processes and adopt efficient replenishment practices. This is crucial, because implementing ECR principles in logistical processes is a big effort and there are a lot of product categories to be managed. Third, the supplier is better able to design a synchronised supply chain when ithastotalresponsibilityoftheentiresupplychain.

The retailing industry has had difficulties in imple- menting ECR in practice, although the benefits have been commonly accepted. It also lags behind other industries in exploiting outsourcing in business process development. We conclude that combining outsourcing and ECR will be the solution for the retailing industry that helps to overcome the problems related to them both and that provides a significant competitive advantage.

In the future, electronic commerce will increasingly affect the consumer goods supply chain. A share of the goods will be distributed to the homes of the consumers. On the basis of this study, we conclude that outsourcing the management of non-core product categories enables retailers to make an effective and flexible move to an e- commerce environment. This will be a major topic of further research.

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