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EFFICIENT CONSUMER RESPONSE CONCEPT AS A SUPPORT FOR SUPPLY CHAIN DEVELOPMENT

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ABSTRACT. The article provides a set of information about Efficient Consumer Response (ECR). ECR is defined as a concept focused on increasing the effectiveness of supply chains. It aims at better responding to consumers' needs at reduced costs along the whole supply chain by close co-operation of all members of the supply chain. Pre-condition for successful ECR is a high-level (in terms of transfer rates and correctness) information flow from the selling point (the consumer) throughout the entire supply chain by using common information standards. With this, the ECR concept provides methods for overcoming existing practical and content-related lacks in sphere of up-to-date solutions for truly integrated co-operation in supply chains and satisfying the huge demand for such knowledge in the companies.

Key words: supply chain management, efficient consumer response, category management, product replenishment, enabling technologies, cross docking, electronic data interchange (EDI), electronic funds transfer (EFT), item coding/database management, ABC Costing.

EFFICIENT CONSUMER RESPONSE AT SUPPLY CHAINS

Traditional logistic chain management is characterized by independent links, which fulfill their own specific task. This type of management is identified by optimization of each link independently. However this can result in inconsistency when one link adopts a strategy, which conflicts with the strategy adopted by the previous or next link. The results are high logistic costs and low consumer service levels, which eventually can result in less competitive power for every link and thus for the whole chain.

Despite the fact that most companies are optimizing their links in the chain, practice proves that this is not sufficient. The market is becoming more dynamical and that also counts for relationships with suppliers and consumers. Therefore modern companies must also have an eye for logistic developments outside the walls of their own company. This is where Efficient Consumer Response (ECR) plays an important part.

Efficient Consumer Response is a global movement in the consumer goods industry. The ECR Europe Executive Board expresses the ECR vision as: "working together to fulfill consumer wishes better, faster and at less cost".

ECR has a few starting points. Firstly the definition shows that consumer demand plays an important part. The chain has to ensure continual improvement of consumer satisfaction, products, and quality. Secondly, the definition also shows that maximum efficiency of the total logistic chain is required. The realization of the two starting points cannot be done without accurate information, which

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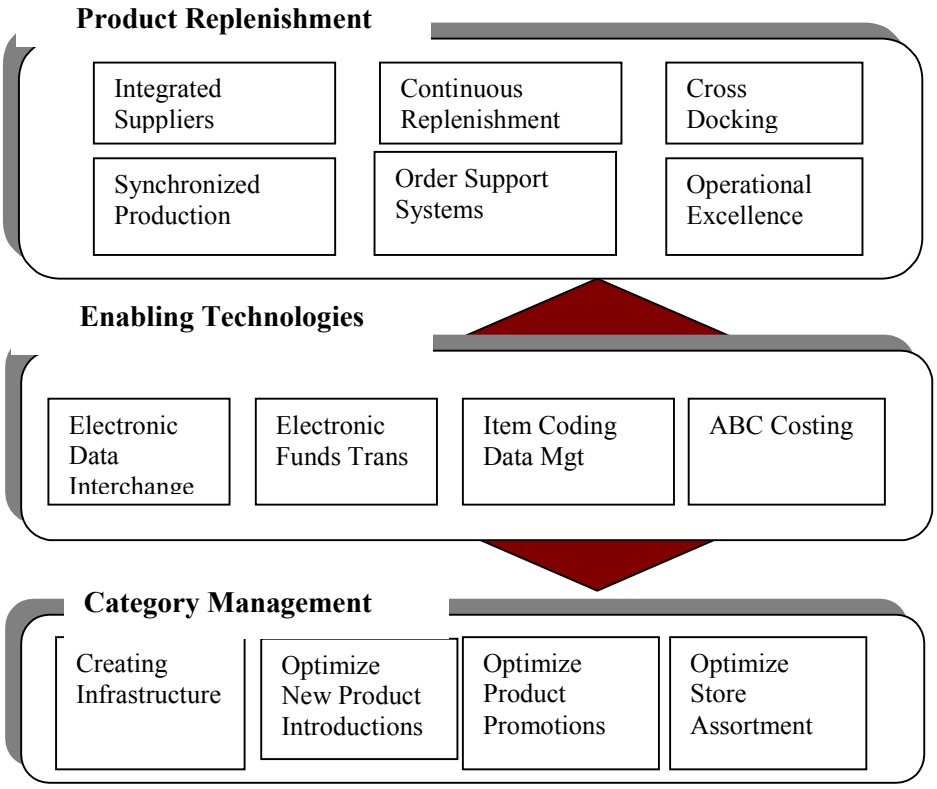
must be available when needed. To keep the costs low, it is preferred that this information and communication is paperless. To accomplish these aspects of ECR, three focus areas can be distinguished, (see Fig. 1):

1. Category management.
2. Product replenishment.
3. Enabling technologies.



Source: Coopers & Lybrand, 1996.

Fig. 1. ECR focus areas
Rys. 1. Obszary ECR

CATEGORY MANAGEMENT

Here the objective is to maximize the effectiveness of the demand creation process. This comprises:

1. Optimize new product introductions.
2. Optimize product promotions.
3. Optimize store assortment.

ECR looks at both how effective trading partners are in their internal activities and how well they work together and use their joint capabilities to maximize consumer value. Of great importance is category management infrastructure, which sets goals in organization, strategic intent and systems on how trading partners communicate with each other and take decisions.

PRODUCT REPLENISHMENT

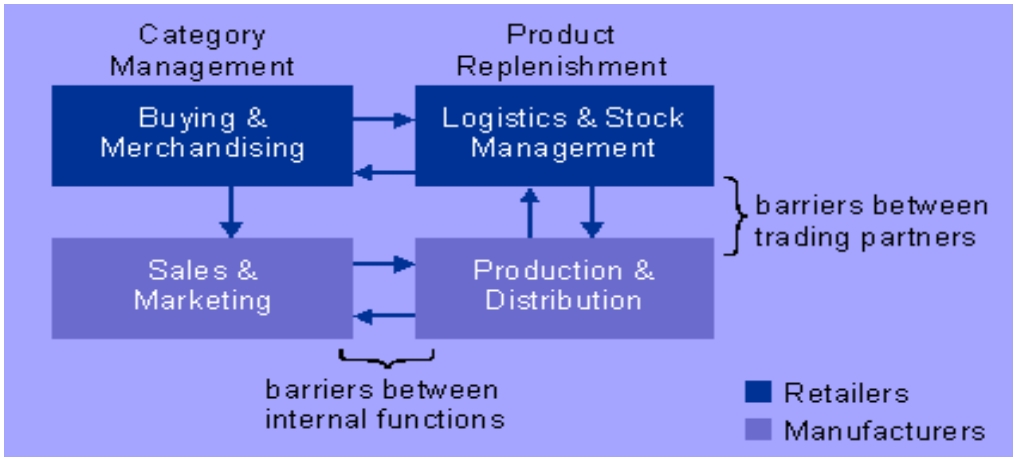
The focus here is on ensuring the slickest possible flow of products to the retailers' shelves. This supports joint category management with a physical supply chain that is flexible and responsive enough to react quickly to changes in demand. Rapid and efficient product replenishment contributes to cost savings through minimizing the amount of inventory in the system while meeting required service levels.

Again, a critically important issue is how trading partners work together to achieve these objectives.

ECR seeks to make a quantum leap in costs and responsiveness through well integrated planning, which avoids activities that magnify variations in demand, which stress the supply chain. Standardization of information and communication can also save a lot of time and money.

ENABLING TECHNOLOGIES

Category management and product replenishment, and especially the joint aspects between retailers and manufacturers are confronted with a few barriers. To overcome these barriers enabling technologies are needed to make category management and product replenishment work.



Source: Coopers & Lybrand, 1996.

Fig. 2. ECR Focus Areas and trade partners barriers.
Rys. 2. Obszary ECR i bariery między partnerami handlowymi.

A lot of data about demand and supply at Stock Keeping Units (SKU) level will need to be moved around and manipulated to determine optimum solutions. Electronic data interchange (EDI) and electronic funds transfer is two ways to do this on the scale required. Item coding and database management are necessary to track products accurately at SKU level. Finally, Activity Based Costing (ABC) ensures that decisions are taken based on the actual cost of doing business and not on what accountants or others assume.

FOCUS AREAS OF ECR

FOCUS AREAS - PRODUCT REPLENISHMENT

Most improvements in operational activities can be found in the way a store is replenished. Product replenishment deals with efficient delivery of the correct product on the correct time at the correct place in the correct quantities. This process is primarily a logistic oriented strategy, which is activated by consumer demand, which is called a 'pull' situation. As we saw in the previous chapter, three trajectories can be identified:

- trajectory from manufacturer to warehouse,
- trajectory from warehouse to retailer,
- trajectory from retailer to consumer.

The aim of replenishment is to integrate these three independent trajectories into the logistic chain in order to create one efficient and effective trajectory throughout the whole chain. This can be accomplished by working together and by using several logistic methods.

In general there are two methods: methods, which work downwards the chain and methods, which work upwards the chain. Downward methods focus on the trajectories from manufacturer to consumer. Much attention is paid to these methods, because it affects the main part of the stream of goods. This chapter deals with the following methods:

- continuous replenishment (CRP),
- integrated suppliers,
- synchronized production,
- Cross docking,
- operational excellence,
- order support systems.

The upward methods deal with the stream of goods, which are sent in the direction from consumer to manufacturer. One can think of empty containers, pallets, empty packing, defective products and material, which have to be recycled. For many years this topic received little attention, but the upward stream of goods is becoming more and more a hot item, due to environment policies.

Still many companies do not react on this, because most methods result in an increment in costs and are therefore not considered efficient. But other companies realize that profits can be gained by using these methods as a marketing instrument. That is why methods concerning the upward stream will not be discussed in this chapter, because they are still in preliminary stage. [Gaither, N., 1994]

CONTINUOUS REPLENISHMENT

One of the major subjects in product replenishment is called continuous replenishment (CRP). Continuous replenishment coordinates the information trajectories and the stream of goods in the logistic chain in order to create a continuous stream of products. This enables retailers to keep fewer products in inventory.

The advantage of inventory reduction is lower inventory costs and shorter product lead times. Also the operational costs often decrease due to decrement in handling. The effect is higher and improved service levels, because less out-of-stock sales will occur and the retailer will become more flexible.

Continuous replenishment consists of three stages. First one has to determine the order to be placed for each product based on the sales, which are registered at the cash register. Then the order has to be

processed correctly at the warehouse. Finally the goods have to be delivered. These stages have to be well coordinated in order to reduce errors and to create a continuous process.

Enabling technologies can be of great help; scanning and electronic data interchange can speed up the process of ordering and reduce errors in processing the order, due to standardization of information. Furthermore good relations and cooperation between trading partners is very important in order to make continuous replenishment work. Only when all involving partners are willing to share information, such as information on sales, CRP can work.

CROSS DOCKING

Cross docking considers moving goods in a warehouse with minimal handling. Goods, which are brought in from manufacturers, are not stored in the warehouse, like in the traditional way. Instead they are shifted into trucks, which are meant to drive away to the store. This method decreases the inventory costs and handling costs. Cross docking also reduces lead times of products. This can result in lower prices, which serves the consumer's needs.

Cross docking in its optimal form consists of shifting a whole pallet, arrived from the manufacturer, to the truck of the store without any handling. This is only possible when a store needs a whole pallet from a specific manufacturer. When this is not the case, one speaks of partial cross docking. In that case parts of a pallet have to be shifted to another pallet first. In both cases no inventory is used for storage, thus eliminating the warehouse's storage function.

Cross docking requires close cooperation with manufacturers, warehouses and stores. Coordination of the information trajectories is a necessary condition in order to coordinate the stream of goods. It is necessary that a warehouse has information about the goods to arrive before shifting these over to trucks. Therefore enabling technologies, such as electronic data interchange and usage of sales information, can improve the process. Without standardization the warehouse cannot make a schedule related to usage of docks and personnel.

Cross docking is only applicable to products with short lead times and which are ordered in great quantities. This technique is frequently applied in warehouses, which form the most important part in this process.

ORDER SUPPORT SYSTEMS

Ordering by computer is an important medium, which is relevant when considering efficient delivery in the logistic chain. Order support systems are systems that implement the order process by means of information technology (IT). The goal of order support systems is faster and better order processes and processing of the orders. This does not only affect ordering for consumers, but also for retailers and warehouses.

Users are able to quickly send an order with the advantage that errors are reduced in processing that order. This means that lower lead times are established, which result in less out-of-stock sales and eventually lower prices. A necessary condition is the usage of standardized electronic communication. [A. Mitchell, 1997].

FOCUS AREA - ENABLING TECHNOLOGIES

Information Technology is focused on acquiring, processing and transmitting of data. After World War II this technology developed explosively. Prospective people pointed out the implications of this technology, when computers were introduced. While the industrial revolution brought mechanization,

this technology would bring automation. Until that time, people were needed to process data in order to control processes. Information technology would change that in future.

We speak of computer networks, when different computers or computer-based systems are connected to each other. Although there are quite a lot networks today, most of the possibilities and implications are not realized yet. In most cases one is still busy with the technology itself, others just use several simple applications. Apart from that, still a lot of possibilities have to be discovered. Networks have created a lot of new techniques to provide information.

These enabling technologies can be used to overcome the barriers between retailers and manufacturers, as pointed out in the part about Focus Areas of ECR. Efficient category management and efficient product replenishment are very dependent on accurate information. It is clear that enabling technologies are very important; therefore this chapter will discuss this topic more extensively than other topics.

In this chapter the following technologies will be discussed:

- Electronic data interchange,
- Electronic funds transfer (EFT),
- item coding/database management,
- ABC costing.

ELECTRONIC DATA INTERCHANGE

Electronic Data Interchange in literal sense is nothing special. Someone who types a text on a computer, saves it on a floppy and reads the same text on a different computer, would in this sense also be doing electronic data interchange. Therefore, in practice a different meaning has been given to EDI. We define:

EDI is the interchange of standardized messages between computers about trade transactions between the involved parties.

Taking a closer look at this definition reveals three interesting key points. Firstly, the messages are standardized, which means that the messages are specified according to fixed rules, such that the meaning is clear and unambiguous. Communication between two parties is roughly done as follows: the sending party fills in a form, which is then standardized by a message processor. This translated message will be sent to the other party and is translated back by their message processor.

Secondly, the definition speaks about interchange between computers. It is better to speak about interchange between computer applications instead of interchange between computers. Interchange between computer applications does not only cover pure communication, but also automatically sent messages, which are generated by an application. This feature makes EDI a value adding technology for most companies. If EDI were considered as pure communication only, then it would be just an expensive alternative for a fax machine. Moreover if companies do not integrate EDI into their internal applications, they lose 70% of the potential benefits.

Finally, EDI involves data interchange of trade transactions of the involved parties. This means that standardized interchange of information between establishments of the same company is not considered as EDI. Note that this type of interchange is already implemented and used on large scale. The parties, implied by the definition, have to be juridical independent companies, such as manufacturers, consumers, banks and transporters.

ELECTRONIC FUNDS TRANSFER (EFT)

Electronic funds transfer (EFT) is a quite young technology, which has been successfully introduced in 1996. This technique enables one to pay with and withdraw electronic money, which is thus not physically available.

DATABASE MANAGEMENT

After World War II, information technology developed explosively. People began to store a lot of information into computers. But after several months or several years the space occupied by information was nearly exceeding storage capacity. Research showed that a lot of information was not needed in daily business processes and furthermore there were a lot of errors and redundancy in the data. This development led to a new scientific approach of information storage and usage, called Database management.

Database management focuses on the creation, maintenance and usage of databases. This concept is very important, because most of the methods discussed in this paper are dependent on accurate information. For example a database with product information, such as prices, inventory levels etc., is very important for efficient product replenishment and order support systems. A database with customer information is crucial for efficient product promotion. Just-in-time management can lead to great losses when wrong or erroneous information is used.

The goal of database management is to:

- reduce redundancy in data, such as storage of duplicate records. This leads to less input and storage costs and less probability on erroneous data,
- create logical data independence, which means that programs can use and alter data, without conflicting with other programs, which use the same data,
- create physical data independence, which means that programs do not have to be altered, when a different storage technology will be implemented. This enables one to change to a better, cheaper or bigger storage medium,
- better security against data loss, damages, electrical disturbances and data abuse.

These goals lead to faster response times and search capabilities, correctness and consistency of data, faster development times for new applications. There are three levels of database management in order to achieve this. These are:

- database administration,
- data administration,
- information resource management.

[Epiq Technologies, 2006]

FOCUS AREAS - CATEGORY MANAGEMENT

The purpose of category management is improving the operating results of the company by focusing on the consumer. Consumers are getting more demanding and want to choose from a large assortment of products. Furthermore consumer satisfaction is a great advantage in a competitive business environment. In this view products are more than goods, which are just being sold; products also play a strategic role.

In practice one treats a group of specific products as a business unit, which is called a category. A category is defined as a distinct, manageable group of products that consumers perceive to be interrelated or substitutable in meeting consumer needs. In this setting category management is defined as follows by the ECR category management subcommittee:

Category management is the process between parts in the logistic chain, where categories are being managed as strategic business units, producing enhanced business results by focusing on delivering consumer value.

Looking carefully at this definition reveals a few key points of category management:

- category management is a process and involves series of interrelated activities,
- category management is comprised of many distinctly different distributor and supplier components. Therefore, either should not do this process alone,
- the aim of category management is improved business results, but also (considering the previous key points) an improved relationship between trading partners,
- the underlying foundation for these improved results is ultimately based upon understanding and meeting consumer needs more effectively in the products offered.

Thus a basis for good category management is formed by good cooperation, where the retailer takes the initiative. In order to analyze and adopt a good strategy for category management, several focus areas can be identified. Category management has the following three-focus area:

Optimize New Product Introduction

Optimize new product introduction deals with efficient and effective developing and introductions of new products or services based on consumer needs. The primary goal is to reduce the number of failures of product introductions and the costs associated with them. The secondary goal is to react more dynamically by means of better information structure throughout the logistic chain. The profit due to this will be that the consumer will have a clear product overview. Moreover only value adding products will be on the shelves in the stores.

Product introductions can be classified in many ways. One aspect is the measure of innovation. The simplest introduction is the introduction of a product, which is an improvement of an existing product. One also has expansion of the assortment, for example introducing soap for dry skin, while normal soap already exists. Introducing a product, which is completely new, is called a product innovation.

A second aspect of product introductions is time. Some products are added to the assortment in a specific period of the year, which is crucial for the sale of that product. One can think of charcoal for barbecues in a supermarket or orange custard during the Dutch Champions League football.

Optimize Product Promotion

Optimize product promotion deals with efficient and effective promotion strategies, which affects all parts in the logistic chain. Three techniques of product promotion can be identified, these are:

- consumer advertising,
- consumer promotion,
- trade promotion.

The goal of product promotion is using these three techniques throughout the logistic chain efficiently and effectively in order to improve the application of the promotion-budget and to form a clear overview of products for the consumer. The next figure displays the three techniques in relation with the logistic chain.

The first technique of promotion is consumer advertising, which concerns promotion between retailer, manufacturer and consumer. Traditional means of consumer promotion are advertisements on

radio, television and advertisements in newspapers and magazines. But with new technologies such as CD-ROM, CD-I and the Internet, one can place consumer specific advertisements.

A special application of this technology is electronic consumer-cards, which make it possible to track and analyze consumer behavior. This analysis can be used to send advertisements by E-mail to consumers. This technology also makes it possible to show a specific advertisement on a LCD screen, when a consumer walks in the store, based on his consumer behavior. In this way the retailer can stimulate a consumer to buy specific products. This approach has great advantages, however certain privacy issues must be dealt with first.

The second technique of promotion is consumer promotion. This technique forms an important part of promotion strategy. It concerns promotion between the manufacturer, retailer and the consumer. One must think of special offers or premiums (little gifts, which come with the product). Traditional means are coupons and savings-stamps. The differences between these two are that coupons create product-loyalty, whereas savings-stamps create store-loyalty.

The special offers and saving methods can now be implemented more efficiently by using electronic cards, which replace the savings-stamps and can be used to acquire a discount. Again it is technology that makes this possible.

The last technique is called trade promotion, which only affects the first three parts in the logistic chain. This type of promotion only concerns transactions between companies and does not affect consumers. The promotion often concerns special offers and discounts. Traditional means are letters and folders, which are being sent between the parties involved.

This type of promotion can also be done more efficiently by using electronic data interchange. This technology makes it possible to send and receive information very fast and allows better coordination of promotion, which can serve consumer needs better.

Optimize Store Assortment

Optimize store assortment deals with composing an assortment of products and services, which is complete and profitable, and also satisfies consumer needs. The aim is to use the space in the store efficiently and the advantages are higher profits, better clientele and less frequent out-of-stock sales. Optimize store assortment, from the point of view of the consumer, means a better and flexible assortment and also less frequent out-of-stock sales.

When optimizing the existing space and assortment in the store, the value of the product, which accounts for the profit gained, must be taken in consideration. The preferences of consumers can be studied with the help of information on the actual sales, which are gathered by the cash registers and by information revealed by market research. This enables one to adjust the assortment to the consumer's needs.

Determining the profit of a product per cubic meter can also be helpful to assortment planning. However one must not forget to take into account the needs of the consumer. There is a strain between the value a consumer assigns to a product and the value, which the product generates when it is sold.

Two methods, which can help in the above analysis, are direct product profitability (DPP) and direct product costing (DPC). Both methods are variants of activity based costing (ABC). Activity based costing is a method, which relates costs and profits with activities. This results in better understanding and insight in costs and profits, which enables one to make decisions about those products.

There are several important issues, which have to be taken into account when planning optimize store assortment. Firstly, the cooperation between parts in the chain is of crucial importance. When several trading partners combine information about products and sales, a good overview of the market can be formed. This makes optimize store assortment possible with great success.

Secondly the space must be allocated on basis of correct data. Allocation space is an important key point in Optimize Store Assortment and this space is directly related to the profit per cubic meter. Therefore this allocation must be based on information retrieved from:

- correct scanning at the cash registers,
- historical data of sales,
- database with products in the store,
- demographically oriented data.

Optimize store assortment is a difficult process. That is why it is important to monitor the results of the current assortment and the results due to changes in the assortment. This enables one to response quickly to product introductions or special offers.

Prior to discussing category management, it is helpful to position category management in the context of several opportunities facing the industry.

Category management represents a method for managing increasingly complex consumer demographics. Consumer lifestyles have changed dramatically over the past decades. Consumers are getting more demanding and want to choose from a great assortment of products. Furthermore consumer satisfaction is a great advantage in a competitive business environment.

Given these challenges, many distributors and suppliers are intensifying their efforts to understand and meet the changing consumer needs. For example, many have a growing interest in understanding the composition of their "loyal consumer base" and in defining the purchase behavior associated with these consumers.

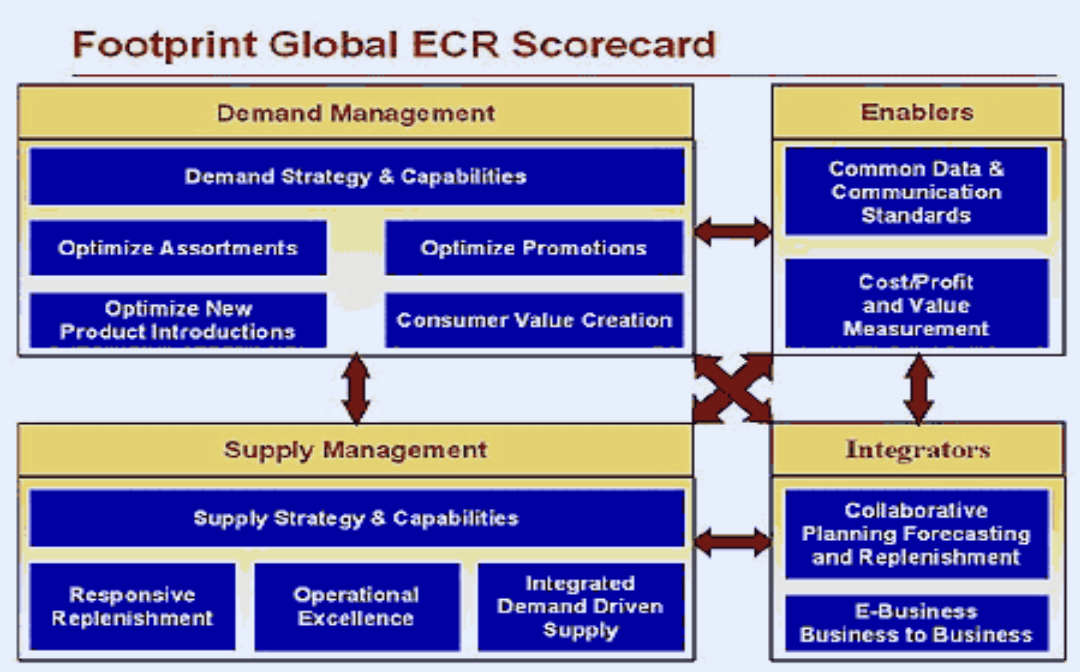
Awareness is growing that failure to recognize and appreciate consumer loyalty can be costly. For retailers, research consistently shows that the loyal consumer represents a fraction (20 to 30 percent) of consumer traffic yet results in the majority of sales and profits (70 to 80 percent). [Partnering Group, 1995].

By providing better consumer value through category management, both distributors and suppliers can become more productive, especially in the key areas of new product introductions. But suppliers are faced with significant competitive pressures as well. In addition to the intense competition among manufacturers in increasingly mature categories, the emergence of high quality distributor brands has further pressured the market share of national or regional brands. Concurrently, many suppliers are experiencing unprecedented new product failures.

All these and other changes have triggered many within the industry to do more with current resources and to refocus on the basics of meeting consumer needs for value, variety and service. This is where category management can be a powerful tool for meeting these consumer needs in a marketplace sharply and more competitive.

SUMMARY

The previous discussion on Efficient Consumer Response shows that most methods and techniques used in ECR were already known. But ECR shows how these methods and techniques can be used with each other and with new technologies. So the way in which they are used is new. In this setting the focus moves to a total supply chain optimization instead of independent optimization of parts in the chain. The goal is obviously to decrease the costs throughout the chain and a more dynamical reaction to consumer needs. ECR focus areas have a dynamic structure, so they have been changing through the years. The focus areas of ECR look as following, see figure 3.



Source: http://www.ecrnet.org, January, 2006.

Fig. 3. New structure of ECR Focus areas.
Rys. 3. Nowe struktury obszarów ECR.

There are some aspects, which are named in the other way, and some which are quite new such as CPFR or RFID belonging to communication standards.

There is no doubt that ECR can make a real difference to the business prospects of those companies, which successfully implement it. Judging by the interest shown in the activities of the ECR board, there is no doubt that many leading companies regard ECR as a powerful initiative for a change. But surprisingly it is the traditional benefits that these companies are looking for from ECR: profit, revenue, market-share and fundamental competitive strength.

These companies understand that the creation of outstanding consumer value is the only secure route to achieving sustainable financial success. The industry faces a number of threats over the next few years, with developments such as on-line shopping, which would open up new retailing possibilities, giving consumers the ability to replenish their larders without ever visiting grocery stores. New entrants, with different capabilities could bring even greater pressures to bear on those players who have not maximized their efficiency and effectiveness.

Few people disagree that the industry is in need of reform. Compared with other high profile industries, which have undergone radical changes in recent years, for example the automotive, electronics and financial services industries, other industries must realize that they too will have to undergo its own version of "Big Bang".

Trading partners need to have informed discussions about which activities lead to benefits and which do not. Only then can they take rational decisions on which practices to keep and which to change. The "survival of the fittest" rule is still destined to apply in the ECR world. Companies' willingness and ability to achieve excellence in ECR implementation will largely determine how much they will win or lose.

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ECR JAKO KONCEPCJA WSPOMAGAJĄCA ROZWÓJ ŁAŃCUCHA LOGISTYCZNEGO

STRESZCZENIE. Praca przedstawia koncepcję Efficient Consumer Response (ECR), ukierunkowaną na ciągłe zwiększanie efektywności łańcuchów logistycznych. Głównym celem takiej metody postępowania jest osiągnięcie większej możliwości reakcji na potrzeby klientów przy jednoczesnej redukcji kosztów całego łańcucha dostaw poprzez ścisłą współpracę wszystkich członków tego łańcucha. Warunkiem koniecznym, aby ten model sprawnie funkcjonował, jest zapewnienie przepływu informacji o wysokim poziomie jakości (w sensie: częstości transferu oraz poprawności i trafności przekazywanej informacji) z punktu sprzedaży (konsumenta) poprzez cały łańcuch logistyczny, przy wykorzystaniu standaryzowanych form tego transferu. W ramach powyższego zagadnienia, koncepcja ECR dostarcza metody postępowania usuwające istniejące słabe punktu obecnie stosowanych rozwiązań, które umożliwiają pełną zintegrowaną kooperację w obrębie całego łańcucha dostaw i spełniającą wymagania stawiane przez przedsiębiorstwa w stosunku do przepływu informacji.

Słowa kluczowe: zarządzenie łańcuchem dostaw, ECR, category management, uzupełnianie zapasów, stosowane technologie, cross docking, elektroniczna wymiana danych (EDI), elektroniczna wymiana funduszy (EFT), oznaczanie jednostek, zarządzanie bazą danych, metoda kosztów ABC.

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