

Making Category Management More Practical

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The historical roots of the category-management concept can be traced back more than 20 years. The concept came to the forefront in the early 1990s as part of the Efficient Consumer Response (ECR) initiative. One of the early difficulties was to define category management, and many, somewhat conflicting definitions have been presented (Dussart 1998). Harris and McPartland (1993) said it consists of three interrelated elements: a philosophy for strategically managing a business that recognizes categories as strategic business units, a process through which retailers and suppliers jointly develop category plans, and an organizational concept that dictates the integration of buying with merchandising. This paper uses a simplified “process” definition: category management is the use of sales data, buyer profiles, and store characteristics to make product-assortment and shelf-arrangement decisions. The logic behind the concept is that faster-selling products deserve more shelf space and better shelf positions. This research looks at how the concept has evolved and suggests a practical approach that seems to address many of the criticisms of category management.

Contributions from Category Management

One reason category management is important is that consumers like having choices. Ratner, Kahn, and Kahneman (1999) found that people choose less-favorite options on some occasions to experience variety. Stores that did not offer consumers some variety probably would lose customers to stores that gave people more choices. In addition, the assortments people are exposed to and how products are organized affect their choices (Kahn and Wasink 2004). Therefore, shelf arrangement can be an important tool for influencing sales. Unfortunately, retailers sometimes provide too much variety. Research by Willard Bishop Consulting and Information Resources, Inc. (1993) found that if

supermarkets reduced duplicate items a little, they could boost category sales. Stores that eliminated too many “duplicate” items experienced category sales declines. Therefore, an optimal level of variety exists that may be slightly below what many supermarkets are offering. Category management attempts to identify the optimal level of variety for a retailer.

Early success stories encouraged retailers and manufacturers to adopt category management. In 1997, Giant (Landover) said they were pleased with the concept and were expanding their efforts (*Chain Store Age* 1997). It helped Supervalu reduce items in test stores by 12 percent and increase category sales by 6.5 percent (Purpura 1998). In 2003, Spartan claimed category management was the key to rebuilding their retail business (Ghitelman 2003). As category management became more popular in the food industry, it also spread to other industries including automobile parts, apparel, hardware and home supply, and bookstores.

Even after 10 years, category management is being employed in new ways. An ACNielsen survey found greater use of many category-management practices (*Mass Market Retailers* 2004). Cannondale Associates reported that more retailers and manufacturers rated category management as highly important in 2004 than in other years (*Convenience Store News Online* 2004). Another survey found that category management was the area with the most collaborative progress in 2004 (Veiders 2004). A majority of food-industry members seem to believe that category management offers much potential.

Criticisms of Category Management

As category management was being embraced by many retailers and manufacturers, there was growing criticism about how the concept was being used. Glen Terbeek (1993) of Andersen Consulting argued that if category management is not selectively used as a tactic within an overall marketing strategy, it will cause serious problems. He was concerned that category management treats each category

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separately and does not consider how changes will affect complementary or competitive categories or shopper experiences in the store. In addition, practitioners of the concept were using chain-level, not store-level, data and were measuring performance with sales or gross-margin dollars instead of direct-margin dollars per square foot of space or customer loyalty. Terbeek believed that tailoring each store to the needs of the customers who shopped that store was essential for improving store profitability.

After experimenting with category management, some retailers decided that it was not useful. An executive from a large Southern supermarket chain declared, "Category management is dead" (Wellman 1997). Sainsbury, a large chain in the United Kingdom, eliminated its entire category-management department because the benefits did not appear to exceed the costs (Storey and Benady 2001). In a survey of retail executives by Ernst and Young, 40 percent thought the benefits of category management had been exaggerated and 73 percent thought the industry had shown little improvement with its use (*Supermarket Business* 1997). Stanton (1999) agreed that category management should die because it is a bad practice.

The list of specific criticisms is fairly long. Initially, firms lacked an understanding of category management and needed considerable training. Because the focus is on individual categories, the definition of a category affects what products are considered in each analysis. Often the category definitions that manufacturers use may not make much business sense from a retailer's perspective. Another problem was that category sales drivers and the supply-chain costs were not usually considered. The typical category-management analysis does not address when to expand the space allocated to one category at the expense of another category. Distribution- and handling-cost differences between items were generally not incorporated into the analysis.

As firms started using category management, they experienced diminishing returns from the process. A survey of manufacturers by Silvermine Consulting Group revealed that 41.7 percent estimated that it took between 100 and 500 hours to complete a category-management project and 19.4 percent thought it took more than 500 hours (Kelly 1996). Besides being time- and resource-intensive, the analysis can perpetuate in-store errors. If a product is out-of-stock, its sales are reduced and competing brands may gain volume. A shelf

assortment developed using sales data from this period would give the product less shelf space and less on-shelf inventory, so the out-of-stocks would continue. New products present another problem. If a store chooses not to stock a new item that its customers would want, a category-management analysis of that store's sales would not identify the mistake. The process also depends on accurate sales information. Given that stores sometimes have scanning problems (e.g., scanned prices too high or too low, items missing from the scanner database, etc.), analyses that rely on this data could be flawed. A similar problem is that a manufacturer could focus a brand's promotions on the period used in a category-management analysis, gain additional shelf space based on the inflated sales rates, and then stop promoting the brand. The development of category captains (i.e., manufacturers who are selected by retailers to counsel them on assortment and shelf-arrangement decisions) has raised some legal issues because the advice given may be biased (Desrochers, Gundlach, and Foer 2003).

Many category management analyses work with aggregate data. This could be at the chain level, so store variations may be ignored, or they could be at the store level, so preference differences across customer segments may not be considered. The process does not look at customer satisfaction. A study by Clayton/Curtis/Cottrell found that when many stores started practicing category management, their shoppers did not notice any differences (*Progressive Grocer* 1995). In general, the process provides few consumer benefits. When one retailer started using it in one category, prices increased and sales decreased (Basuroy, Mantrala, and Walters 2001). Although this may have increased retailer profit, the change could also have encouraged some consumers to shop at competing stores. Most category management analyses also do not consider the benefits of consistently carrying the brands that a customer segment wants to buy (Krishnan, Koelemeijer, and Rao 2002). Dropping slow sellers could lead people to switch stores because a key item on their shopping lists is no longer available.

There are also three technical problems with category management analyses. First, category management usually emphasizes the number of facings for each brand, not shelf placement. Dreze, Hoch, and Purk (1994) concluded that shelf placement is more important than facings. Second, the role of each category in a store's marketing strategy is

undefined. Some analyses treat every category the same. Dhar, Hoch, and Kumar (2001) suggest that price, promotion, and assortment should vary by category role. They recommended four category roles: staples, variety enhancers, niches, and fill-ins. Changing a category's role would change the tactical recommendations from an analysis. Finally, average sales data is used to make incremental assortment and facing decisions. Lee and Brown (2001) showed that average revenue is not a good measure for shelf-space reallocations in the juice category. The marginal effect of each facing needs to be estimated to make better decisions on shelf space. Unfortunately, most category-management analyses do not estimate the marginal gains from facings.

Addressing the Concerns

Some people who work in the category-management field have tried to address these issues. One idea is to move from category to aisle analysis (i.e., aisle management) or to develop new "supercategories." This might reduce the cost to analyze the entire assortment offered by a department because it would decrease the number of separate studies. The traditional category-management process used in an analysis has eight steps. ACNielsen recommended changing the process to include nine steps (Kent 2004). Their new process included clustering stores based on the characteristics of consumers in their neighborhoods to reduce some of the aggregation problems. Cannondale Associates developed their own new category-management process with five steps (Cosgrove 2003). The focus of the five steps was to speed up the analysis and help differentiate retailers. Although these proposals provided some minor improvements, many of the criticisms of category management were not addressed.

Academic researchers have also considered the problem and have developed four approaches that could be helpful for product assortment decisions. The first approach involves studying and modeling the contents of shopper market baskets. For example, Russell and Kamakura (1997) divided consumers into segments based on their purchases, estimated the category structure, and noted synergies between categories using a probabilistic model. This approach would include complementary and competing categories in the analysis and identify slow-moving items that are profitable for a store

because their buyers tend to make large transactions.

The second approach attempted to model sales trends using time-series data and identify the effects of promotions and other variables. This has proven to be very difficult because promotion effects vary and some may have long-term impacts on sales. Jiang et. al. (2004) developed a Bayesian vector error-correction model that attempted to minimize the problem of nonstationary time series. This approach could help identify sales gains from assortment changes.

The next method involves constrained optimization. Several researchers have proposed maximizing a store's revenue or profits by selecting the best prices and quantities sold for each item subject to demand and shelf space constraints (e.g., Borin and Farris 1995; Urban 1998; Lim, Rodrigues, and Zhang 2004). Items with zero quantity would not be stocked on the shelf. There are several variations of this method, but a common challenge is the problem's complexity. Standard algorithms cannot solve it, so the researchers proposed alternatives (e.g., simulated annealing, greedy search heuristics, genetics algorithms, multi-stage experiments, tabu search, squeaky-wheel optimization etc.). Besides the challenge of using these sophisticated algorithms, a major difficulty is that the demand that is relevant for retailers includes many nonlinearities that cannot be described with a smooth function, such as price-ending effects (Schindler and Kibarian 2001). Therefore, the results may not be readily applicable to a retailer's needs.

The final method from academic researchers involves testing assortment and shelf-arrangement options with virtual shopping simulations. In these studies, shoppers navigate a store environment on a computer screen, examine products on the store shelves, and make selections. This approach has been used to test store and shelf arrangements in several industries (Burke 1996; Needel 1998). Tests on the method's validity have shown that purchases in virtual stores are similar to purchases in real stores with the same configuration (Burke et. al. 1992). This method could be used to test several candidate category assortments and arrangements to identify which generated most store profits. This method would probably be very useful for developing and testing principles that category managers could use for designing assortments and shelf arrangement for stores. Testing each category plan for

every store layout would be cost-prohibitive given the wide variation in store configurations.

A Practical Category-Management Approach

If each item's retail price is fixed at a level that a store might use, the constrained-optimization approach becomes much simpler to solve. The objective can be expanded to examine the profit generated from three shelf regions: the prime location (about 51 to 53 inches from the floor), above the prime location, and below the prime location. Each of these areas would have a space-available constraint and a function linking quantity with facings for each item in that area. Distribution and handling costs for each product can be incorporated into the profit function. The functions linking quantity with facings should incorporate important complementary and substitute relationships and should have a negative second derivative over the range of reasonable facing levels.

Stores could be grouped using the characteristics of the people living around them, as ACNielsen suggests. Stores in the same cluster are likely to have similar responses to marketing stimuli. The quantity responses to different facing levels in each shelf region could be developed using virtual store tests on typical stores from each cluster. Expanding the space constraints to the aisle level and adding other categories from the same aisle to the objective function could help allocate category space. A benefit of this approach is that it is less dependent on having accurate sales data. Sales information could be used to set the constants in the quantity-facings functions.

This optimization problem probably could be solved using standard algorithms, perhaps even those in spreadsheet software. Although there continues to be a risk of not finding the optimum, the simplicity of the objective function and the constraints makes this less likely. The method could be repeated for several combinations of item prices. This practical approach appears to address many criticisms of category management and may produce the type of useful results that were hoped for when ECR designers included the concept in the initiative.

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