

The Theory and Practice of Optimizing Assortment and Space



A sophisticated space and assortment customization capability is required for competitive success in today's retail environment. This paper provides a panoramic overview of this challenging subject.

Are you prepared to customize assortments?



Why read this paper?

Optimizing retail space and the item assortment in that space has always been a concern of retailers and manufacturers. The reasons are easy to understand

- From the retailer's viewpoint, shelf space is an important asset.
- Assortment variety increases inventory cost.
- Assortment is also critical to demand generation and shopper satisfaction.
- From the manufacturer's standpoint, assortment selection and category space allocation are equally critical. Manufacturers cannot generate an adequate profit if their products aren't on store shelves.

Today these space and assortment issues are more important than ever because the competitive pressures and pace of change are accelerating.

- As retail channels blur, assortment and space decisions are critical to the survival of the retailer.
- Retailers must tailor assortment by neighborhood to compete effectively.
- This means manufacturers must offer specific recommendations on a SKU by SKU, store by store, retailer by retailer basis.
- The complexity of the task is overwhelming existing resources so both retailers and manufacturers must rethink how to address this growing competitive imperative.

Actions to consider

If you are a retailer:

- Align internally around the role each category plays in your merchandising strategy and the implications for relative category space and assortment.
- Develop your store clustering strategy to facilitate assortment optimization.
- Learn the theory of "transferable demand" to understand the risks and rewards of assortment decisions.
- Familiarize yourself with the new research and shelf planning technologies emerging to optimize assortment and space.

If you are a manufacturer:

- First understand that competitive reality requires a reassessment of resource allocation. Fine tuning probably is not the answer.
- Develop a gold standard assortment strategy for your category reflecting assortment "best practice".
- Adapt that gold standard to the major store formats and relevant retail demand cluster variations.
- Master the new research and space planning technologies.
- Internalize key strategic skills. Outsource commodity functions to third party experts.

Optimizing assortment and space has always been a challenge but as retail competition has intensified so has the magnitude and complexity of this challenge. Everyone is struggling. The pressure is particularly intense on the manufacturer account teams at major retail accounts such as Walmart, Walgreens, Safeway and 7-Eleven where they are being asked to recommend and build assortments for literally thousands of locations. Continuing the current approach in organizational skills, data and analytics, process and technology will almost surely fail. A complete reassessment and resource re-allocation is needed today.

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Executive Summary

The consumer package goods competitive landscape is changing with startling rapidity. The digitally empowered shopper has adopted cross channel shopping behavior. As a result, retailers find themselves in hand-to-hand combat for the shopper's dollar in every neighborhood. These retailers are looking to their manufacturer trading partners for help in localizing assortments. Manufacturers who ignore the retailers' requests for help in tailoring assortments to local needs will lose influence and lose SKUs from the shelf. Retailers who fail to respond to local shopper needs will lose shopping trips and in the long run will lose shoppers themselves. Walmart's negative experience with their "Project Impact's" Draconian assortment reduction is the clearest possible evidence of what can happen to the strongest retailers when they ignore the importance of assortment.

Given the pace and scope of change, manufacturers and retailers require a quantum leap in their assortment localization capability to compete effectively. Everyone is being overwhelmed by the urgency and complexity of meeting the environment's new competitive requirements. Merely maintaining the current assortment localization capability is a recipe for failure.

This paper suggests that CPG leaders must develop a comprehensive new capability which will require more and better resources. Specifically this paper suggests four areas where executives should focus:

- **Better trained people** with complementary sophisticated skills within a reconfigured organizational structure. This people component will probably include the outsourcing of some tasks to third party providers with highly developed skills.
- **New data and analytics** that identify locally appropriate SKU's across multiple micro markets unique to multiple retailers.
- **A process** that brings order out of the mind numbing complexity of thousands of SKUs across scores of markets and retailers. This process demands internal alignment within manufacturers and retailers **before** they enter into a collaborative process with one another.
- **Remarkable new software capabilities** including planogram generating tools capable of creating literally thousands of individualized store specific versions with minimal stress on personnel. One major advance is the availability of cloud computing which obviates the need for expensive and time consuming internal upgrades of native applications.

The paper starts by describing the basics of space and assortment optimization led by the work of the Efficient Consumer Response committee in the early 1990s. That work identified the critical concept of "transferable demand" which still drives assortment optimization after 20 years. The paper then summarizes lessons learned over the past 20 years of efficient item assortment analysis. Among these learnings are

- categories vary in their need for assortment localization
- the ROI of localization varies from category to category

- intelligent localization can drive category sales by as much as 5%
- leading edge manufacturers and brokers are producing localized assortments and planograms in remarkable numbers with startling speed
- Assortment localization imposes new demands on the supply chain which is especially vulnerable to break down when planogram integrity is the responsibility of harried aisle clerks.
- Best practices for assortment localization are emerging in every aspect of the process. These practices are identified in this paper., for example:
 - new models in organizational capabilities including outsourcing
 - new analytical approaches to developing store clusters and appropriate SKU adds in redefined external geographies
 - new tools and tool configurations and
 - A rigorous process for both internal alignment and a collaboration between trading partners.

This paper does not mandate a specific cookie cutter approach on assortment optimization for any given manufacturer or retailer. That's because every situation is different. Every category, every manufacturer and every retailer is unique and the variation inherent in every manufacturer/category situation and retailer/category situation from a strategic and tactical perspective makes a specific point solution unrealistic.

But the paper suggests that each manufacturers and retailers can develop a specific roadmap by assessing where they are on the CatMan "Maturity Curve" shown in the graphic below. By reviewing the characteristics of each stage and each component of the curve as detailed in the appendix, industry leaders can assess where they need to focus their category management and assortment optimization efforts.

The Category Management Maturity Curve

STAGE						STAGE
Aspiring						Aspiring
Excelling						Excelling
Advancing						Advancing
Adopting						Adopting
Embryonic						Embryonic
CURVE COMPONENTS ↓ ↘	Embryonic	Adopting	Advancing	Excelling	Aspiring	CURVE COMPONENTS ↙ ↓
<i>Data examples</i>	Limited geographic share data	Account specific share data	Extensive HH Panel data	Retail loyalty card + robust shopper data	Integrated big data	<i>Data examples</i>
<i>Analytics & Software examples</i>	Microsoft tools, no analytics	Shelf management tools	Retail tactics optimization tools	Total store shopper \$ optimization	Integrated value chain prediction	<i>Analytics & Software examples</i>
<i>Organizational Skills examples</i>	Sales and trade \$ analysis	Some 3 rd party CatMan training	50% of personnel certified	All personnel certified	Expert across retail/vendor value chain	<i>Organizational Skills examples</i>
<i>Process & Culture examples</i>	Internal focus; retailer as adversary	Adjunct of sales team; No category captaincy	Captain in major accounts	Key internal link; valued by retailer	Involved in all strategic issues across value chain	<i>Process & Culture examples</i>

Only one thing seems universally true: Every manufacturer and retailer needs to enhance its space and assortment optimization capabilities in light of the new pressure for assortment localization. To meet this new competitive imperative, CPG management leaders must commit the time to understand their unique situation and then commit the resources required to win.

The evolution of space and assortment theory within the discipline of Category Management

The discipline of category management is now 20 years old. It grew from the frustrations of retailers and manufacturers who saw their sales and profits eroded by a sub optimal collaborative process (actually a non-existent collaborative process). At that time many industry thought leaders admired the success of collaborative processes developed in Japan based on the work of American academician W. Edwards Deming. As the consumer package goods (CPG) marketplace became more complex and costs increased, industry thought leaders began to entertain the idea of creating more collaborative business processes to reduce costs and increase profitability across the CPG value stream.

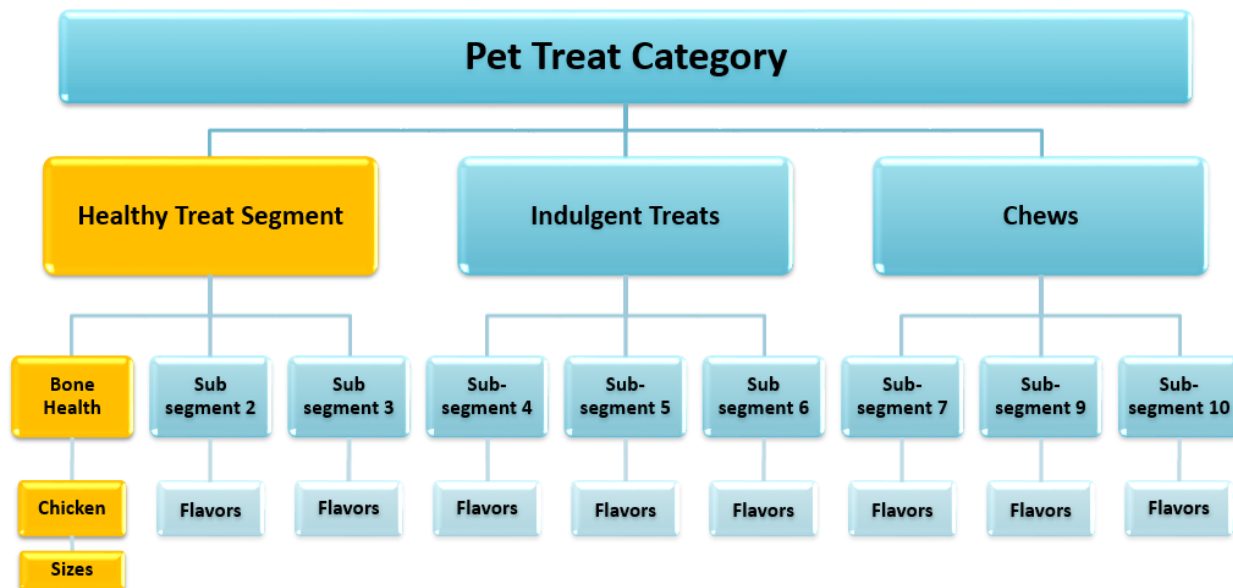
The practical response to this need was the formation of an industry wide committee called ECR (Efficient Consumer Response). This committee comprised of the leading manufacturers, retailers, brokers and wholesalers set out to create processes to improve collaboration across the industry. At a high level, the processes were divided between the supply side and the demand side. The principal demand side process was called “category management”. Within category management the most important sub process was “efficient item assortment”. The writer of this white paper was one of the co-developers of that process in 1994.

The ECR committee chose assortment as one of its first challenges because that process affects both costs and shopper demand. Assortment affects costs because it drives inventory decisions. Poorly conceived inefficient assortments raise inventory costs and waste valuable shelf space, one of the major assets of the retailer. On the demand side, assortment is one of the two most powerful drivers of shopper satisfaction. Price being the other. Excellent assortments appeal to target shoppers by meeting their needs with the most preferred SKU. Poorly conceived assortments fail to satisfy shopper’s needs resulting in slow inventory turns and in lower financial returns on inventory investment. No wonder the ECR committee chose efficient item assortment as the second demand side process to create following the completion of the overarching category management process.

The original efficient item assortment process was designed to be flexible. It recognized that every category is somewhat different. It recognized that any given retail vertical or retail format within a vertical might assign a higher or lower value to meeting all the diverse needs of the shoppers in a category. Therefore the process began by mandating that practitioners specifically identify and prioritize all of the different needs that could theoretically exist within a category. This was done by agreeing to a category structure or category decision tree (CDT) which arrayed the various needs into sub-categories, segments and sub-segments in a prioritized hierarchy based on the best available shopper research.

The graphic on the following page shows a schematic representation of a typical category, in this case pet treats chosen for illustrative purposes.

A Category Decision Tree (CDT)



The important thing to realize about a CDT is that each of the individual segments shown as a “box” above represents a discrete pool of consumer demand. For example in the schematic above a shopper may wish to buy a healthy snack for bone health in a specific flavor in a specific size. This combination of needs (health/bone/flavor/size) represents a unique shopper demand just as all the other boxes in the CDT represent discrete shopper demands. The key questions for manufacturers and retailers are:

- Do I need to have an SKU in each segment of a category (each box in the CDT) to optimize my volume in the category? Or
- How many different items within the each of these identified pools of demand do I need to offer to optimize my volume in the category?
- Could I reduce the number of items in a given demand pool thereby reducing my inventory costs without risking a loss in overall category demand?

From this series of questions emerged one of the most powerful concepts in the assortment discussion, “transferable demand.” That concept asks a simple question : If I omit an SKU from a specific pool of demand or perhaps even eliminate all of the SKUs in a specific pool of demand, (e.g. all small size packages or all chicken flavored items) can I transfer the demand from the omitted SKU to one of the remaining SKUs in the assortment? Or will the shopper prove so loyal to that particular set of needs (the omitted SKU) that she will exit the store without buying?

Determining what demand can be transferred from omitted SKU A to authorized SKU B versus what demand will be lost by removing SKU A was the question in 1994 when the efficient item assortment protocol was being developed. It is still the question today.

Useful metrics to estimate “transferable demand”

To aid in answering the question on transferable demand, the original ECR efficient item assortment protocol provided critical metrics discussed briefly below. (Please see appendix A for the method of calculation.)

Each of these metrics attempted to provide practitioners with the answer to the question: Compared to another marginal SKU in the assortment, is this SKU’s volume more or less likely to be transferred to another SKU remaining in the assortment?

Today several third party providers such as Kantar, JDA, 5thDimension, APT and others have more contemporary ways of estimating volume transferability. However, these original metrics still have value and in some cases are more practical and lower in cost than today’s advanced methodologies. Every brand owner should have some working knowledge of these metrics because they can be used to defend retention of a specific SKU or encourage inclusion of a SKU based on easy to understand logic.

Here are the four key metrics:

Loyalty:

The logic for using this particular metric is fairly simple: given the choice between a SKU whose shoppers are intensely loyal to it versus another SKU whose shoppers are less loyal to it, practitioners should choose the high loyalty SKU over the low loyalty SKU because more of the volume of the low loyalty SKU could be transferred to other SKUs in the assortment.

Shopper worth:

The logic for using this particular metric is that it encourages practitioners to keep high worth SKUs in the assortment and can justify removing SKUs whose purchasers are worth less to the category. A common outcome from the use of this metric was encouraging the inclusion of larger sizes in the assortment because larger size purchasers tended to consume more of the category in a year. For example, purchasers of 40 pound bags of dry dog food often owned two or more dogs meaning they had more mouths to feed and therefore more dog food to buy.

Substitutability:

The logic for using this metric was to favor the inclusion of items with low substitutability versus those with high substitutability because by definition items with high substitutability had lots of transferable volume. Comparing substitutability data allowed practitioners to omit the item with high substitutability and transfer that item’s volume to the other SKU’s in that item’s decision set.

Exclusivity:

The logic for using this metric was that items with high levels of exclusivity had less transferable demand and therefore should be kept or added into the assortment. Removing SKUs with high levels of exclusivity would put that volume at risk because the shopper would simply buy at another retailer. Please see the section below on how an understanding of this metric could have saved Walmart the lost volume experienced in their “Project Impact” initiative.

Because Nielsen and IRI have increased the size of their respondent base by nearly 5X in 20 years, the metrics shown can now be developed with reliability for smaller categories, smaller brands and unique attributes within most categories. We strongly urge category management practitioners to understand the metrics discussed above for their brands within the context of their categories.

Lessons learned from Walmart's "Project Impact"

In 2009, Walmart decided to improve its shopping experience. They announced "Project Impact" the key components of which were reducing aisle cluttering displays and removing approximately 15,000 SKU's about 10% of the SKUs in the typical supercenter. Despite some initial sales declines in a few test stores, Walmart management charged ahead based primarily on very positive shopper research response regarding the new less cluttered stores.

At about this same time, this writer had breakfast with one of Walmart's top executives and our conversation turned to Project Impact. He expressed concern verging on foreboding primarily because one of his own direct reports had complained to him personally about the removal of a specific SKU to which he was exclusively loyal in the jam and jelly category. The Walmart exec quoted his employee directly "I had to go to another store here in Bentonville to get this green mint jelly. It's embarrassing because everybody knows I work for Walmart".

My breakfast companion openly wondered how many other ordinary shoppers would have this same experience and abandon Walmart. I looked at him and said. "You should be worried, you're going to lose at least 3% of your volume because you have removed all of these SKUs". The Walmart executive looked at me as if I had told him his dog had just died. "Why do you say that?" He asked.

I pulled out a paper napkin and scribbled some quick mathematics on it and pushed the napkin in front of him.

Here's a simple example. You have a category with three brands one of which has a 50 share, the number two brand has a 40 share and you have a small third brand with 10% share. So you decide to remove the small 10 share brand to unclutter your shelves. The chances are quite high that a small number of shoppers account for a large percentage of the third brand's sales, probably something in the range of 30% at minimum. When they discover that their exclusive choice item is missing, they will not buy any other item in the category and they will leave the store.

If these shoppers actually comprise 30% of the delisted brands volume and they all make the decision to leave the store you will lose 30% of a 10 share brand translating to 3% of total category volume. In all likelihood this will happen repeatedly across every category where you have made significant item reductions especially where you have removed entire brands. Word will spread throughout your shopper base and they will start reducing their visits to Walmart. You guys are in real trouble."

It was no surprise when Walmart's sales declined for nearly 2 years performing worse than their direct competitors in an already difficult economic environment. Walmart management eventually discovered the error of their ways and stopped their plan to expand Project Impact across their entire store base. But the damage had been done. Wall Street analysts estimated Walmart lost \$2 billion in sales primarily because they did not understand the simple metric of "exclusivity" and its power in determining shopper response to assortment.

Optimizing by Attributes

During the 20 years since the original optimization protocol was developed, new kinds of data have emerged to enhance optimization decisions. One of the more intriguing approaches involves optimization by product attributes matched against retail target shopper audiences on a neighborhood by neighborhood basis. An attribute can be defined as a brand, a package size, a flavor, a price point. An attribute might also reflect an ingredient related to a ‘good for you’ health positioning. In specific categories, other attributes or data are also valuable e.g. a neighborhood with more cats than dogs per 1000 households would justify more space and a larger assortment of cat food than in a “dog dominant” neighborhood.

The initial application of this attribute approach came from a Finnish firm, Analyse2. They began to assemble a broader range of data including shopper loyalty cards, geo-demographic census data and various versions of panel data. They then began to match assortments to neighborhoods based on a combination of all of these data sources. The initial results were so encouraging to them and their beta retail customers that they began to expand the offering outside of Finland. They have reported positive results in Canada, the USA and South America.

Nearly a year after we became aware of the Analyse2 approach, an article appeared in the November 2013 issue of the Harvard Business Review touting the use of product attributes as a breakthrough approach to assortment optimization. The HBR article advocated the attribute approach across a broader range of product categories than the CPG categories covered by Analyse2.

The attribute approach makes logical sense. Unfortunately it can be complex and sometimes difficult to apply but it points to ways to customize assortments by encouraging the use of disparate data sources and different mathematically based scoring concepts.

Some solution providers like 5th Dimension, JDA and APT among others have developed predictive analytic algorithms that rank SKU’s for assortment consideration based on proprietary weighting of various independent variables. These approaches can be helpful because they often employ multiple input variables in a sophisticated manner.

The nexus of category space and assortment

Space and assortment are joined at the hip. The retailer cannot stock comprehensive assortments especially in highly fragmented categories without allocating significant space to the category. Space allocation itself is a function of the category role within the retailer. That role (a measure of the importance of the category to the retailer's target shopper) varies significantly from retail channel to channel and from retailer to retailer.

In the final analysis, the retailer will decide how much space a category is given because the space belongs to the retailer. Therefore in most situations, the manufacturer's suggestions on assortment are operating within the strategic and practical parameters dictated by the retailer. The manufacturer may feel that a category deserves more space and a larger assortment but must be prepared to explain why.

Take just one moment to compare the relative space given to the detergent category in a convenience store versus the space given to this category in a conventional grocery store. The convenience store may offer only one SKU and one facing for the detergent category while the grocer may offer 40 SKUs and scores of facings consuming 40 running feet of shelf space.

The detergent category is more important to the conventional retailer and much less important to the convenience store operator hence the significant difference in the space allocated to the category and therefore the significant difference in the assortment. Now step back and realize that the grocery store merchandiser and a convenience store merchandiser have a much more complex problem than just one category. They must allocate the space and thereby affect the assortment in every category they choose to sell. Therefore they must make dozens of critical strategic decisions all revolving around their strategy and their target shopper.

Most readers do not realize this but category management was originally developed to address this very problem of total store space and assortment management.

That is why the second step in the category management process is "role development" which is a total store importance concept requiring the retail strategist to evaluate one category versus another on multiple metrics relevant to the target shopper and category.

At the time category management was originally developed, many relevant metrics were difficult to develop and therefore retailers often defaulted to a few simple, easy to calculate metrics such as gross margin return on inventory or retail sales per foot or gross margin dollars per foot. In a very short period of time solution providers began to develop even more sophisticated retail metrics but it was not until the development of shopper loyalty cards and the application of more advanced mathematical approaches that

retailers were able to develop a full panoply of metrics aimed at what became known as “total store optimization”.

Today many retailers use some sort of relatively sophisticated algorithm to allocate category space. These algorithms seek to maximize a specific “dependent variable” such as total store sales, total store gross margin, target shopper market basket value, total return per square foot, etc. By combining data from various sources with new predictive analytics software, the retailer is able to explore multiple combinations and permutations of category space and implied assortment. The software enables practitioners to examine hundreds of alternatives in space and assortment including variations by store size and geo-demographic cluster. Most major third party providers of syndicated share data, retail floor planning and assortment optimization (5th Dimension, JDA, Nielsen, IRI, Revionics, APT) have sophisticated solutions for space allocation at the aisle or department or even the total store level. Because assortment occurs within a specified space dictated by the retailer, determining the space allotment is a basic initial step in the overall process.

The results of these new sophisticated approaches are often quite dramatic. In one widely reported case, a total store optimization algorithm resulted in space changes of more than 20%+/- in 40% of the categories in the store. In some retail clusters, entire categories were removed from the store and their space reallocated among other categories with a resultant increase in target shopper basket value and total store sales.

As mentioned above, these complex algorithms can utilize shopper loyalty card data and total basket content data as well as household penetration and frequency of purchase data. This data enables the software to estimate the effect of changing the space and assortment in a category such as fluid milk that has high levels of household penetration as well as high frequency of visitation. The software would suggest that reducing the space and assortment on this critical category might affect a significant number of shoppers who buy that category on virtually every weekly stock up shopping trip.

Of course total store optimization and for that matter category optimization requires that these demand side issues be aligned with supply side reality. The retailer must keep product on the shelf and therefore space and assortment has to be aligned with the reality of days of supply on shelf which in turn is a function of complex supply chain demands. The most perfect planogram from a demand view is worthless if it cannot be effectively and efficiently maintained by the supply chain. No one can buy an SKU that is out of stock.

Retailers and manufacturers should look to technology to marry space, assortment, and supply. Solution providers such as JDA focus on ensuring assortments aren’t merely theoretical ideals, but instead are both space-aware and supported by inventory levels.

How does space efficiency vary by category?

In the previous paragraphs we have discussed the theory of category space allocation. It's fair to ask: what's the reality of space allocation and returns by category. Fortunately we have a reliable answer to that question. For many years the consulting company Willard Bishop and Associates has conducted a syndicated study on sales and profits by category. This study has utilized similar metrics over a long period of time. The only thing that has varied has been the retail composition of their sample. Down through the years they have measured returns across different retailers being careful to balance their sample by geographic location, store size etc. Virtually everyone trusts the objectivity and accuracy of the Bishop work.

As mentioned above, Bishop reports a series of metrics across virtually every category in the store. The table below shows actual data from the Bishop study with the categories disguised. As anyone can see by a quick glance down the various metric columns, categories vary widely in their gross sales, sales per foot and "true profit". True profit in the Bishop lexicon translates into activity based costing profit which adjusts gross profit by the costs to the retailer of bringing any given item through a complex and often costly distribution system. Therefore store door delivered categories like carbonated soft drinks or most salty snacks show high levels of "true profit" because the external delivery and handling costs are all attributed to the vendor and not to the retailer. By contrast warehouse delivered costs are charged for every step in the supply chain but adjusted to the unique costs incurred by heavy bulky items versus relatively lightweight low cubic dimension categories.

Space efficiency by category

Category	\$ Sales/ Week	\$ Sales/ Foot/Week	True Profit/ Foot/Week
A	\$17,285	\$31.74	\$-0.41
B	\$5,286	\$27.91	\$3.09
C	\$21,157	\$78.45	\$20.89
D	\$1,253	\$6.19	\$-0.95

Source: Willard Bishop and Associates 2013 mega study

So despite the machinations of retail space planners, the actual yield per category per foot varies dramatically. Many factors contribute to this wide variation in sales and profit per foot per category. Categories vary widely in their shelf price, gross margin and display cube dimension. Categories vary widely in the velocity with which they move and this makes an enormous difference in yield per foot. In many cases, the decision to merely carry a specific category comes with the knowledge that it will yield less per foot than another category. Retail merchants also price categories to yield different margins to maintain a competitive price in the marketplace. Important "destination" categories cannot and should not be

expected to yield significant profit per foot because high margins and high profits in such a category would drive shoppers elsewhere. All of these considerations explain why retail merchandise executives do not optimize space purely by category but rather attempt to optimize space across the store based upon a higher level “dependent variable” such as total store sales or total basket profitability for target shoppers.

Given this “total store” viewpoint of the retailer, the challenge for manufacturers is twofold

1. Understand the facts about your brands and your categories in comparison to other categories in the store;
2. Understand the role your category plays in the shopping experience of the retailer’s target shopper.

Both of these issues require the manufacturer to have a more holistic view of the overall shopping experience .Both issues can be overcome by enthusiastic collaboration between the trading partners. This means the sharing of corporate and category strategies, data and technologies. Most manufacturers do a poor job of training their brand managers and even their category managers to understand the larger context of how their brands and categories fit into the retailer’s strategies and how they compare to other categories in the store with whom they also compete for retail space and featuring opportunities.

A few well-trained category managers are familiar with critical retail metrics for their own brands and even for competitive brands in their category but few if any understand the larger holistic vision of the shopping experience which most retailers live with on a daily basis.

In a roundtable discussion of these issues the average retailer will make a better informed and more intelligent contribution to the discussion than virtually any manufacturer with whom we are familiar.

Varying space and assortment by demand based clustering

Retailers have always realized that the shopper base for every single retail location is unique. Over the years most grocery retailers responded to those differences by adjusting assortments in a few categories where demand varied by consistent and easily understandable geo-demographic drivers. More recently, as competition has intensified across all channels and formats, retailers have shown more urgency about responding to differences in the store shopper base by separating their stores into unique clusters. At the same time some retailers have become more sophisticated about varying space and assortment using a variety of new robust data sources and predictive analytics software.

Today virtually every retailer wants to go farther and faster into space and assortment optimization by individual stores or at least by store clusters. Indeed, they see it as critical to their survival. As the retailers and their vendor partners are addressing this complex issue, it may be helpful to take a step back and make some general observations about the subject.

First understand that many categories will not vary significantly by geo-demographics or by attitude driven behavioral differences. Therefore significant work must be focused on those categories which do vary significantly in their buying behavior. (See the discussion below).

In the second place, virtually every category has a core assortment of leading brands, flavors and types that is the same in every retail store cluster variation irrespective of underlying geo-demographics or attitudes. The buying behavior tends to be the same and the assortment requirements the same across multiple segments of the CDT. A rule of thumb in most categories is that items comprising a 90% cumulative share of category will be the same in every store that serves a typical American neighborhood. This means assortment varies at the margin on the smaller share items within segments of the CDT. For example, in a highly fragmented category with hundreds of SKU's (e.g. non-alcoholic beverages) the assortment will rarely differ even across small geo-demographic cells by more than 60 SKU's out of 400 at the outside. Space allocations will always vary somewhat on a cluster by cluster basis but the basic assortment should be fairly stable in most categories with the exception of the last 10% or so of the SKU's in the category.

Finally, practitioners need to realize that while space and assortment variation creates value it also brings complexity and cost across the entire value stream. All parties must be familiar with the supply chain and planogram solutions now available to ameliorate this complexity or they will find themselves in an operational nightmare. At the CMA we have heard numerous horror stories of the difficulties experienced by the need to maintain thousands of planograms in specific categories without being adequately prepared from a personnel, process or software standpoint.

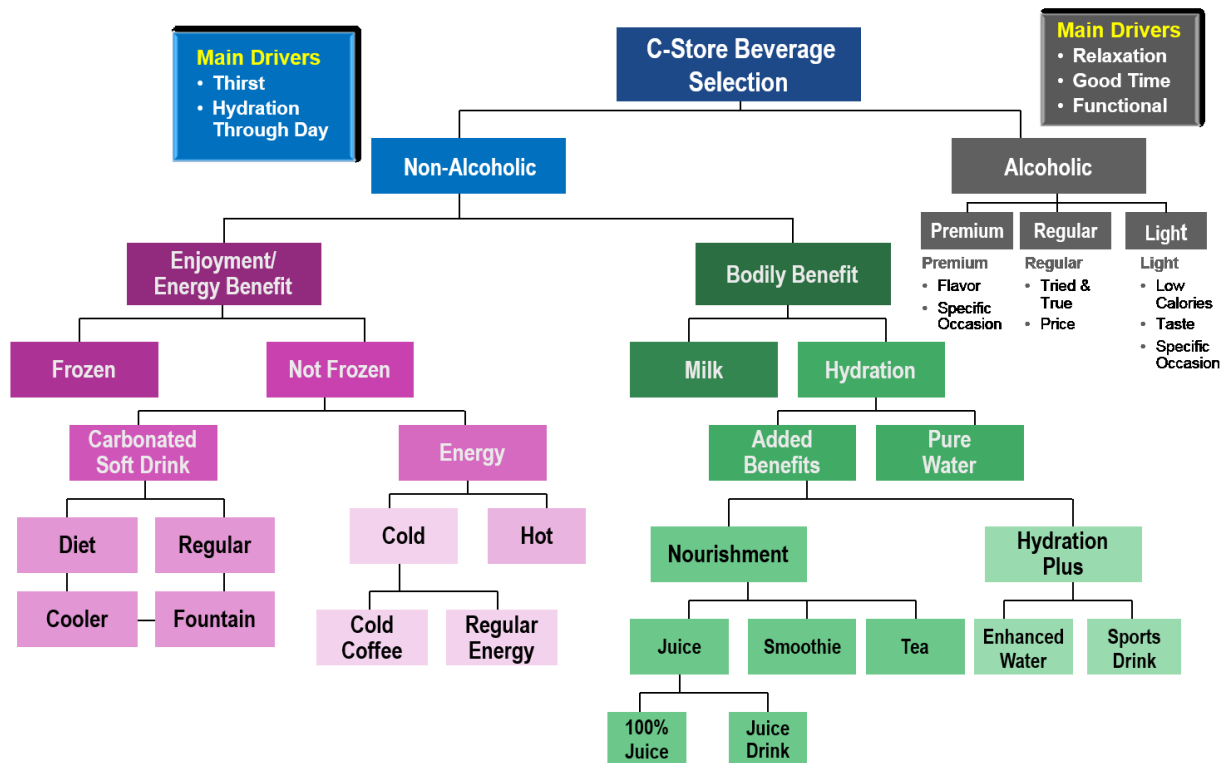
Where demand is based clustering likely to be most critical?

The value of demand based clustering solutions for both manufacturers and retailers varies significantly among categories. As mentioned above, in certain categories it will be less important than others. However in specific categories, demand based clustering is essential to optimizing shopper satisfaction. These categories will engender dozens of assortment and space variations requiring myriad planograms. In our experience, the following category and retail conditions will require customized clustering solutions.

Highly fragmented categories:

Any category with a complex category decision tree will inevitably require a demand based clustering response with unique assortments and multiple planogram variations. Complex fragmented categories mean that the shopper need states are numerous and therefore are likely to differ from store cluster A to store cluster B. The chart below illustrates an especially complex category with numerous need states. As would be expected, this category features hundreds perhaps thousands of individual SKUs that are assigned to the individual segments that then vary in their importance to shoppers on a store by store basis.

C-Store Beverage Consumer Decision Tree



Dynamic rapidly changing categories:

Many categories are unchanged for years. Then the same categories suddenly become quite dynamic driven by external societal attitudinal changes or perhaps an ingredient or packaging change to which shoppers respond in new ways. A classic example is the growing interest in organic foods which affects numerous categories across the store. As these changes occur, they inevitably do so at different rates in different neighborhoods requiring retailers to vary space and assortment according to the presence of shoppers attracted to the emerging benefit.

Retailers with distinctive target audiences:

Retailers can build profitable businesses by appealing to discrete unique target audiences. Dollar stores and other conventional grocery retailers sometimes focus on serving lower income or financially distressed target shoppers while other retailers reach out for an upscale shopper or shoppers with high taste levels. A good example is Whole Foods whose shopper base is not necessarily upscale but whose taste level and need states are quite different from those shoppers who prefer a conventional grocery format for reasons of name brand selection and overall cost.

Retailers with widely varying format footprints:

The same retailer may have numerous formats with widely varying footprints and significantly different space and assortment requirements. Probably the best example is Walmart Mexico which has numerous formats ranging from 1000 sq. ft. neighborhood convenience stores to luxurious 40,000 sq. ft. food stores aimed at upscale shoppers. Obviously any vendor calling on Walmart Mexico must be prepared to offer a wide variation in assortment and space solutions by format. While this is an extreme example of format difference, important differences in footprint, category space and gondola inventory holding capacity is the rule rather than the exception in most major chains across North America. Each variation requires a different solution affecting space and assortment.

A summary of the types of categories that drive the value of assortment localization

Think of categories as falling into 1 of 3 types in terms of the level of detail to pursue. These levels are chain level, cluster level and store level.

-The first case involves categories of the Chain Level type. These are generally low movement, fixed size categories with stable variation by segment and neighborhood which do not justify the extra effort and cost involved in creating either clustered assortments or store specific planograms. A chain wide assortment is determined and rolled out to all the stores.

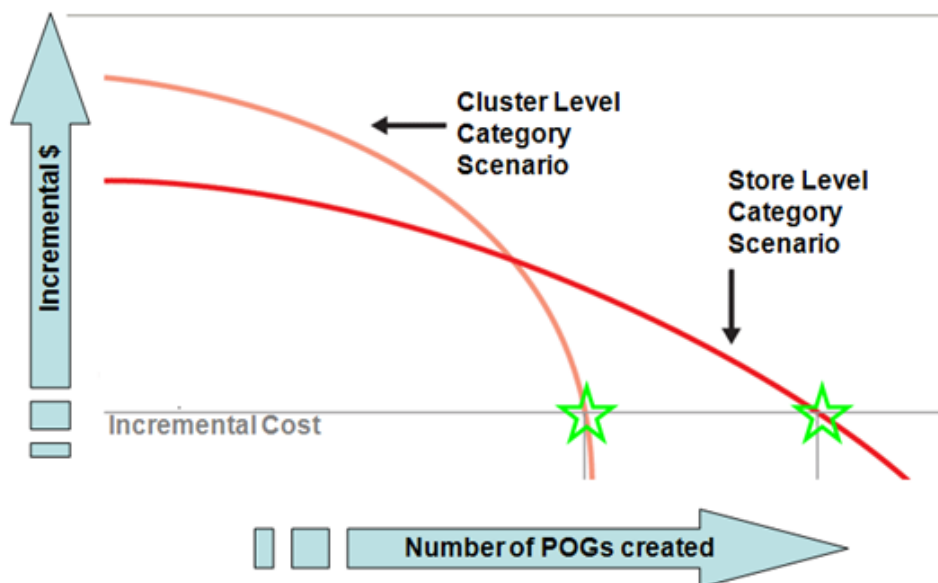
- Cluster Level type categories require planograms at the level of groups or clusters of stores based on a variety of independent variables. Clustering methodology will be discussed later in the paper. These

clustered assortments don't have enough store level movement variation to justify store level planograms. Years of experience backed by studies suggest that that most categories are of this type. In this case, practitioners create the size/fixture variant planograms required to meet the needs of the stores assigned to each cluster. Target inventory levels for items are primarily driven by operational constraints, such as case pack as opposed to the peak demand component of their inventory models.

- Store Level type categories start with a clustered model but now exhibit enough store level movement variation to justify modifying the clustered assortment down to the individual store level planograms. In this case, cluster level planograms are created with cluster level assortments, and then store specific fixture and movement information is used to tailor facings and target inventory levels for each store. -

The graph below depicts the cost benefit ratios of cluster versus store level POG's

- Is it worth my while to planogram to store level?



In the cluster level category scenario (pink curve), the incremental or additional benefit I get in \$ from creating additional planograms begins to drop quickly. In such cases, creating size/fixture variant planograms for each clustered assortment is the economically optimal answer. As we mentioned earlier, these are typically categories where the operational constraint portion of the inventory model dominates the target inventory calculation, and there is not enough significant variation in movement from store to store at the item level when compared to item capacities to justify creating store level planograms.

In the store level category scenario (red curve), the incremental \$ benefit I get from creating additional planograms drops more slowly. Note that the curve intersects the marginal cost curve (grey) farther to the right, and therefore the economically optimal solution is to create more planograms. These are the categories where the peak demand component of the inventory model dominates the operational

constraint and store/sku movement varies significantly from store to store when compared with product shelf capacities.

Technology can help practitioners determine which type of scenario (total chain/cluster/individual store) is right for a specific category retail situation. JDA's IKB tool can help with the analysis. Other suppliers may also offer helpful tools of this type.

Where to begin

To succeed at almost any business endeavor such as an assortment optimization, you need four things:

- people with the appropriate technical skills
- the right combination of data
- the right analytical and solution specific tools
- a process built around trained people, available data and the proper tools

Let us start with the people skills issue.

Almost every participant in the space and assortment value chain will ultimately consider outsourcing some steps in the process. This applies equally to enormous multibillion-dollar companies as well as small companies with revenues below \$25 million. That having been said, we strongly urge all companies to maintain an internal core of people maybe just one person who has the skills to create the space and assortment optimization outputs critical to translating brand requirements into a planogram. This means you need at least one person who understands all of the data, the process and most importantly the functionality of the space planning tools. Therefore even though this person may not be expert in the manipulation of the various planogram packages such as those offered by JDA, 5th Dimension, Nielsen, IRI or Galleria, they will at a minimum be able to interact intelligently with a trained third-party expert.

At present some large companies employ scores of people with reasonably advanced planogram creation skills. In the long term this is probably not the best people solution.

Outsourcing to expert third parties seems more efficient in the long term especially where literally thousands of individual store planograms need to be created and maintained. But even these large enterprises need to have a few internal experts who serve as a critical translator between a brand's strategic desires and a real world assortment optimization solution. These internal experts adapt the brand's strategies to the critical retail channel, format and demand based retail cluster variations in the marketplace. Leading companies are already beginning to realize the advantage of using technology to

generate planograms rapidly while the individuals freed up from planogram creation can move to higher level analytical tasks of more strategic value.

In addition to the planogram software manipulation skill, space and assortment optimization requires market research data analysts with a deep understanding of various analytical approaches and the syndicated data typically provided by Nielsen or IRI. These expert analysts should be able to create custom data sets representing store clusters different from conventional geographically based data normally supplied by the data vendors. These market research based analytical skills differ from the skills required to manipulate the planogram software itself. The analyst tends to emerge from a market research and data analytics background while the planogram software expert tends to emerge from a sales analyst or account team background.

Another skill set that is quite helpful in the customization process is an understanding of the household panel data supplied by the major data vendors.

Lastly, the internal team responsible for space and assortment customization will benefit from a relationship with third party suppliers expert in geo-demographic analysis of retail locations and other experts in unique analytical approaches such as “turf analysis” which can sometimes be helpful in situations where more conventional approaches prove inadequate. We shall touch on this issue later in this document.

If the manufacturer has access to retail loyalty card data, some experience in applying this data to assortment can be very helpful. In most instances ,however, manufacturers will need to reach out to the third party supplier of loyalty card services or to the retailer’s own internal loyalty card specialist to gain the knowledge of loyalty card analytics needed to enhance store level assortments.

To summarize the skills necessary, an internal expert in the manipulation of planogram software is highly desirable. Some of the other required skills can be borrowed from internal market research experts or expert research analysts not necessarily directly assigned to the category management function. Third party experts can be extremely valuable members of the space and assortment team.

Let us turn to the data needs for space and assortment optimization.

These data include

- The retailer’s point-of-sale data at the most granular level possible.
- The retailer’s current store clustering groups whether driven by shopper demand patterns, format type or other geo-demographic considerations. This data should be supplemented by locations for each of the retailer’s current locations.

- Current shelving data for key retail clients. This would include the gondola specifications in height, depth, etc. plus current planograms for existing retail clusters.
- Syndicated share data capable of manipulation into various customized “external market” clusters, for example, specific geo-demographic areas not normally aggregated by the data houses.
- Household panel data organized to reveal brand and SKU strengths sufficient to inform assortment decisions at the margin
- Retail loyalty card data
- Current package dimensions, shipping case capacities and appropriate graphic imagery for software manipulation and accurate visual presentation. This information is often available from various third party providers who maintain an up-to-date catalog for thousands of brands and SKUs.

Please note that the data list above implies open sharing between the retailer and the manufacturer. If either party is unwilling to share this data, effective localized space and assortment optimization is impossible.

Now let us turn to the subject of space and assortment optimization tools.

All these tools are provided by third party software companies who have made a major contribution to the remarkable increases in efficiency and effectiveness of assortment and space planning over the past two decades. The pace of improvement has actually increased in the past five years as software and hardware functionality has dramatically improved.

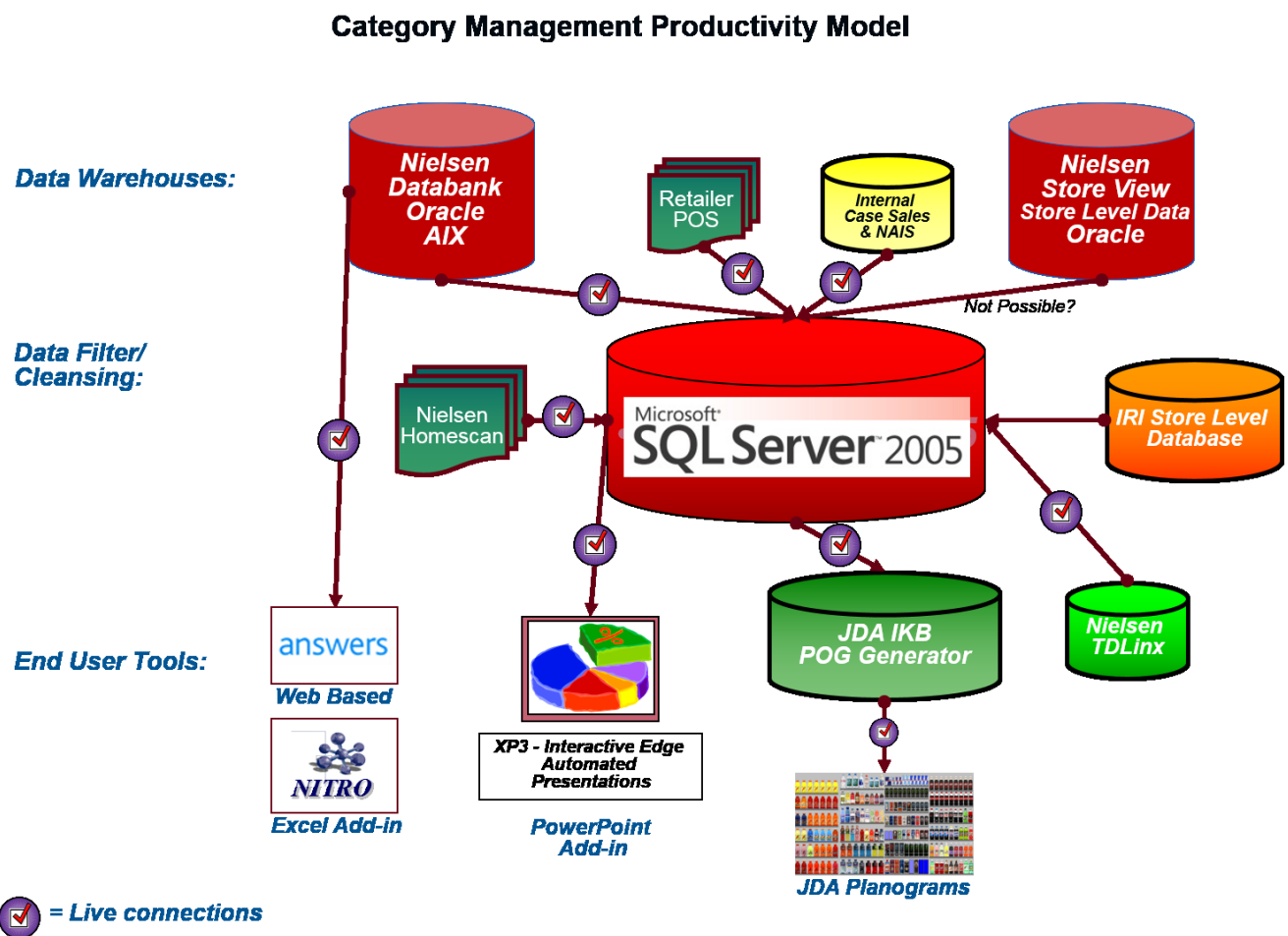
Here is a representative list of tools.

- A sophisticated software server to access the various data bases and provide the critical data to the key software functions
- A primary data repository which in the JDA system is referred to as the IKB. Within this database, the various data are cleaned and then stored for further use. This data cleaning and storage activity is critical to an accurate planogram and an efficient overall process
- Individual databases containing the various data referred to above i.e. retail store POS data, loyalty card data, syndicated share and item velocity data, package imagery data, etc.
- The key planogram production software that manipulates all of the relevant data to produce a customized planogram following a series of rules input by manufacturers and retailers (days of supply, delivery patterns, shelving details, etc.)
- A graphics package which depicts the output of the planogram software with detailed representations of the items, the number of facings, the relative positioning of various brands and segments, etc.

All of these tools are needed but the one tool which has contributed to the most remarkable improvements in store level planogram development is a next generation planogram creating tool such as JDA’s Planogram Generator. This tool was specifically mentioned by P&G as contributing to

remarkable improvements in efficiency by producing literally thousands of store level planograms at Walmart in a few days, a task which would have taken ten X longer only two years before.

The graphic below shows how one manufacturer connects these tools to generate thousands of store level planograms annually.



One major advance is the ability to access some tools in the cloud where outputs can be easily shared and software improvements accommodated much more cost effectively than in native applications requiring scarce internal IT resources. Cloud computing also facilitates the new shared resource organizational model where some internal strategic work can easily be shared with third parties converting these internally developed strategies into externally deployed planogram outputs.

An overview of the process for building optimized assortment for store clusters

At this point we have described a situation which appears overwhelmingly complex (hundreds of SKU's, scores of retailers each with multiple demand clusters.) Chaos threatens the unprepared. Process trumps chaos. You must have a well-defined and documented process. P&G's experience at Walmart provides some useful experience regarding to the importance of process and internal preparation.

P&G Case Study

P&G's experience at Walmart in its towel and toilet tissue categories demonstrates a problem and the solution that is occurring repeatedly throughout the CPG universe.

In the words of Tom McDonald, who is in charge of P&G's space and assortment activities at Walmart, "we had an untenable situation. In the previous year we had been asked to create over 400 individual store planograms and that took us 6 to 7 weeks. Then we were asked to create 4100 individual store customized planograms and that took us 50 man weeks. Clearly something had to change.

Our objective was to create the 4100 planograms in the same time that we had previously used to create a little over 400. In other words we wanted to reduce our time from 50 weeks to something in the range of six weeks and customize every single planogram to reflect the unique characteristics of each store in terms of its shelving and neighborhood demand pattern.

This can only be accomplished by leveraging technology with a rigorous process. We chose JDA's new planogram generator software which is enabled by their IKB database. We took the time to clean the Walmart POS data and ensure that the database was up to the task. In the very first year we met our objective of slashing time spent from 50 weeks to approximately 6 weeks.

Then in the next year because of our own learning curve and the planning we had done during our initial experience with planogram generator and the IKB, we created the 4100 modular in only 10 working days! I am not going to tell you that everything worked perfectly and that there were no bumps in the road because that's not true. What I can say is that we learned valuable lessons that we can deploy across P&G.

Software alone is not enough. We knew we had to prepare internally to create customized planograms efficiently. That means having all of the appropriate data on the store gondola architecture plus all the appropriate data on movement by store. It means developing the store clusters based on a variety of factors mutually agreed by Walmart and our team.

Our next step was to develop gold standard planograms suggesting basic assortments for the key retail clusters that we identified. Then we ranked the SKU'S by segment based on Walmart's POS. As a final step we created the external markets for each cluster and identified the popular SKU's that were not in the gold standard or in Walmart's current assortment.

Once we did this initial preparation, virtually all of which took place internally at P&G, we were able to interact with our Walmart partners much more productively thanks to software enablement."

Building on the experience of P&G, Dr Pepper, PepsiCo and others, here is the process approach likely to produce the best results assuming an appropriate tool set.

Begin by getting your internal data house in order. Capture and clean the data from all sources and especially the retail POS data.

Before addressing specific retailers, identify the primary space and assortment variations that you will face most frequently across your retail universe. In other words begin where you are likely to end. The two primary drivers of these frequently experienced variations will almost always be (1) a difference in shopper demand among category segments (different size need states) and (2) significant difference in the category space which is a function of the variation in the role of the category by major retail channels.

For example in the soft beverage category ,the space and assortment challenge divides along two major axes: the type of format (a convenience store versus a conventional grocery store) and the shopper demand variation among three demand segments, carbonated soft drinks, perceived healthier drinks like waters and juices and various functional beverages such as energy drinks.

Competitors in this complex category know that there will be hundreds perhaps thousands of variations of space and assortment among individual store locations but they will evolve along the vectors of store format and need state variation. Therefore they should start with these major variants, perhaps six major Meta Planogram variants and move forward to the next step.

That step involves building the core assortment by category segment and format. As was mentioned above, in most categories the leading items and demand patterns by SKU do not vary significantly across a diverse universe. Practitioners instantly know which brands are always going to be present in which segments. This is what we mean by the phrase “core assortment”. Even in a category as complex as soft beverage, one can readily identify the SKUs that will account for 80% to 90% of total category volume in the assortment in large format grocery stores and in smaller formats such as convenience stores. It’s at the margin where assortments change in almost every category and segment.

To re-emphasize, we are not saying that these core assortments will always appear in every store. This is not the case but the core assortments will cover 95% of the retail situations that any given manufacturer is likely to encounter. As a simple example, regular Coke is carried almost universally but not in Whole Foods or some other similar formats.

But neither are we asserting that identifying these few basic core assortment alternatives solves the practitioner’s problem. Quite to the contrary, virtually all of the stress across the entire value stream involves varying the 10 to 15% of items outside the core assortment. That is the pain point in customization.

Solving this problem involves analyzing shopper demand in the unique clusters of stores that the data suppliers do not ordinarily aggregate or report as they do report groups such as C-Stores or Grocery stores in the New England Region. So the first issue is identifying those store clusters whether unique footprints or stores frequented by large numbers of health conscious shoppers. The second problem is understanding how shopper demand varies in these unique clusters so that the planogram of the target stores can respond to the demand in the unique cluster. In other words, practitioners need to understand the external market demand in the clusters where the store are competing.

Let's start by addressing the creation of clusters. The challenge revolves around what drives difference in demand?

Is it Demographics? Store format? The absence or presence of a key competitor (Walmart/Dollar General/7-eleven?). Or is it the disproportionate occurrence of specific behaviors such as a desire for healthier beverages or value priced alternatives?

Identifying Important Demand clusters

The task of identifying these demand based clusters will normally fall on the manufacturer. If you don't understand these attitudinally based drivers of demand variation sometime today would be a good time to start the discovery process. Syndicated data and retailer POS data drive the discovery process.

One productive approach is to array category data by segment and create a ranking report based on share of sales by store. For example, comparing the share of sales in health oriented beverages versus CSD's versus functional beverages. A quick scan may reveal a situation like the one in the simple table below. The analyst looked for the 10% of stores with the highest and lowest share of sales for healthy beverages. The analyst found a significant difference in share of sales between these cohorts with most of the difference reflecting a trade off with the CSD segment. A difference of this magnitude would suggest that this health oriented cluster should receive special assortment and space attention.

In this situation the analyst should dig deeper to identify other "independent variables" such as age/income/education etc. associated with the high share healthy beverage stores. This would allow the manufacturer and retailers to identify similar neighborhoods across the store base to validate the existence of a stable "healthy beverage" store cluster.

Beverage Segment Share of Sales by Healthy Beverage Clusters

Store Cluster	Healthy Segment Share	CSD's Segment Share	Functional Segment Share	Total Category Share
Highest healthy share cluster	30%	45%	25%	100
Lowest healthy share cluster	20%	60%	20%	100
Average healthy share cluster	25%	50%	25%	100

Once you have identified the unique demand drivers and pinpointed the individual stores which exhibit the demand driver characteristic, you must group those stores together into a cluster. The next step is to create the competitive market or the "external market" for that cluster. This must be done so you can identify SKU's that are doing well in this demand cluster but are absent from the target retailer's assortment.

The problem is that the other stores in the cluster are likely to be scattered all over the geography just as the target retailer's stores in any given cluster are also scattered across the landscape. So you must identify the other stores that represent the stores near the individual stores in the cluster and create the relevant external market for any given cluster. This means you must work with Nielsen or IRI to create the

appropriate competitive market for each cluster. If for example, the driver is High income households, the data supplier must first identify the target stores and then create an external market by aggregating other stores in comparable high income geography.

This need not be an overwhelming challenge if you as a manufacturer are convinced that only three demand based clusters exist. It is fairly easy for your syndicated data supplier to identify a large group of stores comprising a projectable competitive market around only three demand drivers. The problem gets much more severe if you as a manufacturer feel that you must create separate demand driven clusters for each major retailer. Under these circumstances if you have seven demand cluster variations and 35 or 40 individual retailers, you can easily find yourself developing external markets for more than 200 different target retailer/demand cluster alternatives. This is precisely the situation faced by Nestlé Purina's pet care division. In an effort to provide highly customized external markets for each of their retailers and each of their demand driven clusters, they've created over 200 individual external markets aggregating the appropriate comparable stores in each external market cell.

Once this has been done, the manufacturer compares the existing assortment in the target retailer with the shares in the appropriate external market. This is done by category segment. In some rare cases the retailer may have in his current assortment all of the SKUs in the external market that comprise 85 or even 90% of the cumulative share in each segment. But in the real world this is rarely the case. In a category with several hundred SKUs in the retailer's current assortment scattered across 3 to 10 major category segments, the chances are very high that the retailer will be missing 15 to 20 SKUs which have reasonable shares in the external market. Keep in mind that these excluded SKUs are not likely to comprise a high percentage of the share in any given segment. In our experience, the excluded items are likely to be new in the marketplace or unique regional items. They are likely to be marginal items but this goes to the heart of customization. Assortment customization is about this very issue.

Therefore the practitioner must ask, how I discriminate between the items currently in the assortment and these items which have been excluded but are now revealed to have reasonable demand at competitive retailers in the designated external market.

Here we run face-to-face to the issue of "transferable demand". Do these items not included in the retailer's current assortment represent demand that is unique to these items? Is this demand that cannot be transferred to a comparable item in the current assortment? This is a basic and long recognized question for assortment optimization. Twenty years ago practitioners would fall back on the metrics discussed at the outset of this document (loyalty, exclusivity, substitutability and worth). Sometimes these measures were not available for the excluded SKUs and so practitioners were forced to look at the attributes of the excluded SKUs in a manner subsequently suggested by Analyse2 and the Harvard Business Review article.

More recently third party suppliers utilizing advanced sophisticated mathematics have offered an easier and probably more accurate way to address this issue. The best known approach alternative is Kantar Retail's "Rich Mix" solution which is widely used throughout the consumer package goods environment. This solution calculates transferable demand across the entire spectrum of SKUs and offers practitioners a suggested solution down to the level of the individual SKU. This can be used to identify items that are currently excluded from the retailer's assortment but deserve inclusion. Other third-party vendors such as APT, 5th Dimension and JDA have a different mathematical approach to address the same issue. However all of these solutions become expensive to apply if you have multiple external markets (10, 50, and 200!) Many larger companies solve this problem by licensing an application like Rich Mix, internalizing its use and calculating all of the options across the retail/demand cluster variations. This is the approach used by Nestlé for example as well as many other manufacturers.

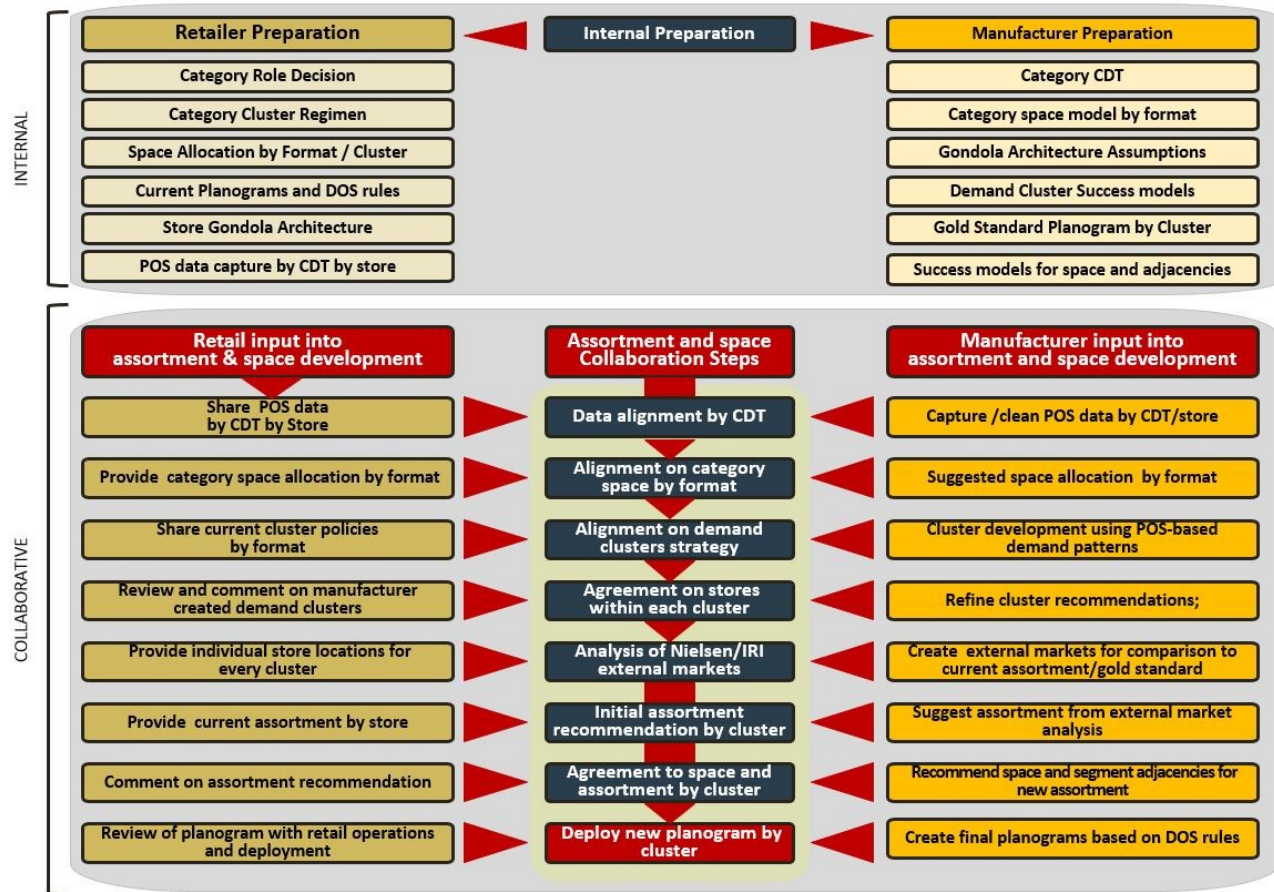
Even this alternative may be inappropriate in some situations. For example calculating convenience store transferable demand can be a challenge even for well-established solutions such as Rich Mix. In these cases, vendors may wish to default to another research option namely "turf analysis". This approach again utilizes a variation of the attribute approach discussed above. In this case the research protocol offers target shoppers multiple iterations of SKUs with unique attributes and calculates that combination of SKUs which generates the most overall demand. In technical terms turf analysis combines a variation of "conjoint analysis" and "discriminate function analysis" to identify the combination of SKUs which captures the most demand in the marketplace. This is not a perfect solution but under certain circumstances is a better alternative to guessing about the optimal assortment.

Today unlike 20 years ago yet another option exists and that is to use loyalty card data as a tiebreaker. For example one might discover that certain SKUs in the retailer's assortment do not command the loyalty of target shoppers and therefore could be replaced by an item growing in popularity in the external market. At this writing, most retailers are not using loyalty card data in a consistent disciplined way in the assortment optimization process partly because the loyalty card does not allow them to see demand occurring in competitive retail locations.

Space and Assortment Process Map

Shown below is a best practice space and assortment process map which basically summarizes the learnings from major companies such as P&G, Nestlé, Georgia Pacific and PepsiCo. It also reflects interviews with multiple major solution providers in this space.

The critical factors seem to be: the importance of internal preparation both by the retailer and the manufacturer, the ability to manipulate large quantities of highly granular data, exceptional skill with planogramming software and a clear understanding of concepts such as the “external market “and transferable demand.



What's the size of the prize?

The CPG industry is notorious for its lack of discipline in measuring the effect of significant changes in practice and policy. Unfortunately, space and assortment optimization is not an exception. In 1994 this writer conducted a rigorously controlled test at Dominick's in which we compared the business results in 10 stores where we had optimized assortment using the original protocol described earlier in this document. We created a matched panel of 10 stores where we left the assortment alone. The test was conducted in the carbonated beverage category where Dominick's carried nearly 400 SKUs. We removed over 20% of the SKUs but kept the same category shelf space which we utilized to add facings for some popular SKUs. We also added 10 to 15 new items to the assortment which deserved listing based on their performance in the external market.

We compared sales in the test and control panels and we also interviewed shoppers as they left the store. Movement in the test stores increased by 3% during the eight weeks of the test. We attributed this increase primarily to fewer out of stocks and an improved ability of shoppers to find their favorite SKU in a somewhat less cluttered planogram. We hypothesized that many of the slow moving SKUs that had been removed from the test stores crowded out some SKUs that received only one facing before they were rewarded with additional space freed up by the removal of some 80 SKUs.

The interviews with shoppers who had visited the CSD aisle revealed some surprising reactions. Shoppers had a slightly better attitude toward the assortment in the test stores than in the control stores even though the control stores had nearly 80 more SKUs. The shoppers reported slightly less difficulty in finding their desired SKU choice in the test stores.

More recently, a large test of total store optimization affecting every category in the store generated volume increases in the range of 3 to 4%. In the real world, it is highly unlikely that a retailer would reset every category in every aisle at approximately the same time. For reasons of cost and shopper convenience, retailers prefer to reset two or three entire aisles at the same time or at most an entire department. The exception is when a store is remodeled or when a new store is about to be opened at which point a retailer can execute a total store "optimization reset".

Quite recently we have seen fairly carefully controlled tests involving large categories in which volume increases again in the range of 3 to 5% were measured in the optimized stores. In these occasions, significant changes were made across the category such that in some store clusters one category segment was dramatically expanded while in other clusters another segment was given an increased assortment.

And a final data point: When Analyse2 reset a major supermarket in Finland using their comprehensive attribute based assortment approach, store sales increased by 5%.

What we're seeing therefore is a rather consistent increase of 3 to 5% attributable to optimizing an assortment measured nearly 20 years apart and in widely different categories and channels. Of course, these are one time/first time optimizations. Repeated increases of 3% or so year on year are unlikely.

What is at stake beyond near term sales gains?

Space and assortment optimization is about something more important than a onetime sales increase. Optimization or if you prefer assortment and space customization is about meeting shopper needs at a time of unprecedented competitive pressure for both retailers and manufacturers.

Today's shoppers have grown to expect exactly what they want precisely when they want it.

All of this discussion about process and people, software and analytics boils down to meeting these new ardent expectations. The retailers and manufacturers who measure up will succeed in gaining and retaining the loyalty of shoppers. Those who don't will fail and will be deserted by their shoppers. The retail environment in which everyone now competes is as complex as a Rubik's cube and is rapidly changing as a child's kaleidoscope. Every company must ensure that its business model aligns with the new competitive reality.

The greatest challenge is finding and retaining the skills needed in the space and assortment process. They are in short supply.

Realistically many companies will find themselves outsourcing some of the steps in this process. The higher level strategic steps in which the company's strategies are connected with the space and assortment decisions should be internalized. Beyond these critical steps, however, many major retailers and manufacturers are finding that it makes more sense to outsource work to trusted third party providers who have progressed well up the learning curve. They have become expert at capturing and cleaning the data and then using sophisticated software to transform internally developed high level assortment models into cluster by cluster store by store unique assortments.

The Experience of Acosta

Acosta is one of the largest sales and marketing agencies in North America. The company provides numerous services to the most trusted CPG manufacturers and works directly with virtually every CPG retailer across multiple channels.

Acosta's Senior Vice President Space Management Solutions, Jim Hanson, describes the scope of Acosta's space and category management activity. "In addition to providing full-service support to manufacturers, we also provide outsourced space management solutions for numerous manufacturers and retailers. These range from large companies for which we may create 30,000+ individual store-level planograms to smaller clients for whom we provide the full range of assortment and space planning starting with strategic development and ending with a specific planogram in a specific retail location."

Acosta employs over 310 space management experts across the U.S. and Canada including 210 who work in-house at retailer headquarters offices. This team uses all of the major planogram tools such as JDA's Space Planning, Symphony EYC, and Nielsen Spaceman with access to Nielsen and IRI data as well.

"The space and assortment solutions we offer have exploded in popularity primarily because of the demand from retailers for assortment and planogram customization down to the level of the individual store. This has overwhelmed most manufacturers to the point where they are outsourcing some, if not all, of the planogram process to third parties like us."

"We do our best to keep up with all the new developments in planogram-related software. This software keeps improving and the data that drives the software keeps changing and advancing. Because this is such an important business for Acosta, we focus on staying abreast of and testing all the new developments."

In addition to the programs listed above, Acosta has built proprietary tools that enable more efficient space analysis that helps its space technologists get to the analysis phase faster. These tools help its clients understand distribution across planograms, space opportunities by region, banner or store through indexing, and can even provide solid quality control when validation is required prior to submission to the retailer. Another valuable tool is the Lost Sales Analysis tool which can not only help forecast out-of-stocks, but can quantify the lost sales due to the out-of-stock.

Another key to Acosta's success and one of the reasons its business keeps growing is that the company builds so many planograms and therefore has become exceptionally proficient at utilizing all the benefits of each of the software programs. A good example is the use of Space Automation through JDA Space Planning – which gives Acosta the ability to develop scripts that automate tedious functions. This not only saves time, but reduces error rates. Companies who do not use the software and the data on a continuous basis cannot develop the proficiency that Acosta has mastered from frequency of use.

"The time and money savings we can produce today versus as recently as three years ago is really astonishing. For example a typical planogram development project involving one reasonably complex category and a 1,500 store chain would have taken 30 days to complete three years ago. Today we can probably do that task in less than one week once we have the data, clean it and upload it into our systems.

"Manufacturers know that retailers want customized space management support. Many now know that Acosta can provide that service at a lower cost and deliver higher quality on their behalf.

Assortment Optimization and the Supply Chain

Of course space and assortment process outputs are at the end of the complex supply chain whose objective is to keep the right product at the right place on the right shelf at the lowest cost and the least disruption. No one doubts that space and assortment optimization across multiple categories, multiple channels and hundreds of thousands of retail locations increases the challenge to an already stressed supply chain. That is why decisions relating to space and assortment must be integrated into the practicalities of the supply chain with all of the sophistication it requires all the way back to forecasting.

The challenge of compliance and planogram maintenance

Transforming a digital planogram into a real live shelf set is time-consuming, costly and difficult requiring the collaboration of multiple manufacturers, brokers and retailers often operating across multiple categories and aisles. Even more challenging is maintaining the integrity of the planogram in the store where the best trained and highly motivated aisle clerks often find themselves overwhelmed by the 2,000+ SKUs that are in every aisle of a typical supermarket. According to Shelf Snap, the typical in store assortment is missing 28% of the items approved in the digital planogram.

These same studies reveal that at any given time half of the planograms in the store do not conform to their agreed configuration. Worse still, the same studies indicate that 3,000 items are out of stock at any given time in the typical large grocery format. This problem is most severe in the high velocity categories which comprise the 20% of store sku's that contribute 80% of store sales. The obvious result is disappointed shoppers who always have the choice of going to the store across the street or even more ominously going online to a distant endless aisle where the desired SKU can easily be located.

Here again technology is coming to the rescue by providing associates across the supply stream with mobile devices having the proper POG displayed for immediate review in the aisle. Several third party POG developers such as JDA provide support for tablets with the store level POG 's to enable compliance.

Summary

A space and assortment optimization capability has become table stakes for everyone in the CPG ecosystem. Every category in every channel presents different challenges. These challenges can only be met by understanding the process, the skills, the data and the software now required to meet the new standards of competitive success. We hope this paper has helped guide you down a path to success which begins within the offices of CPG leadership who must commit the appropriate resources to keep pace with the demands of the marketplace.

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Gordon Wade is one of the founders of the category management discipline. In 1991, along with Dr. Brian Harris and Bill Burns, Gordon started the Partnering Group to improve collaboration between retailers and manufacturers. They were asked by the CPG industry co-coordinating committee called Efficient Consumer Response (ECR) to lead development of the category management process.

Gordon's personal contributions to CatMan include the development of the Efficient Item Assortment process for the ECR committee along with virtually all the consumer focused analytical templates subsequently committed to software by Nielsen and IRI. Gordon has served scores of manufacturer clients around the globe in the development of their CatMan platforms and has facilitated category management projects with retailers and manufacturers on every continent.

In 2005, he was asked by the Association of National Advertisers, the world's largest Marketing Trade organization, to develop best practice in marketing accountability, the measurement of marketing's ROI. He has published two white papers on accountability that focus on the interrelationships of process, metrics and systems. He has founded six marketing related companies and currently serves as an advisor, board member or major investor in three leading edge marketing services companies.

Gordon is an alumnus of P&G's marketing department and a graduate of Harvard. He resides in Kentucky with his wife, Jill and noble dog, Grace.

Acknowledgements

The Category Management Association is solely responsible for the findings and conclusions herein. We would like to acknowledge and thank the following companies for their contributions:

Acosta Sales and Marketing, JDA, P&G, Nestle, Georgia-Pacific, PepsiCo ,Dr Pepper,Cantactix,5th Dimension, Symphony EYC, Advantage Sales and Marketing, APT, Galleria, TABS and ShelfSnap

Appendix A

Calculating the original Efficient Item Assortment metrics

Loyalty:

This metric is computed from household panel data by identifying buyers of a specific brand or segment or flavor or size and then isolating all of the purchases made by those purchasing the attribute in question. The volume represented by the target SKU is then divided by the total volume purchased by those who have ever purchased the target SKU providing a “share of requirements satisfied” number more commonly known as “loyalty”. Specifically, the purchasers of this attribute (e.g. this brand) gave 60 % of their total dollar purchases in the category to this attribute.

Shopper worth:

This metric is computed by identifying the target SKU and adding together all of the volume in the category purchased by the shopper purchasing the target SKU. This number was converted to an index in which all the sku’s were compared to the category average. This computation will identify those SKUs whose purchasers are of more annual sales value to the category.

Substitutability:

This metric is computed by identifying the target SKU and then calculating the average number of category SKU’s t bought by the target SKU purchaser in the past year. In some cases a specific item’s purchasers would buy no other alternative during the year. They were said to be exclusive users of the brand, a phenomenon we will discuss in more detail below. By contrast the purchasers of some SKUs would buy three or four other alternatives during the year. By averaging the number of alternatives purchased during the year, practitioners could identify items which exhibited a high propensity for substitution versus those with a low propensity for substitution.

Exclusivity:

The last of the four metrics in the original efficient item assortment protocol was exclusivity. This is a particularly sensitive and important metric. It is computed by identifying purchasers of the target SKU who buy only that SKU during the year and then dividing that volume by the total volume of all shoppers who buy the item at least once during the year. Practitioners often discovered that a relatively small percentage of overall brand purchasers for example, 10% could comprise 30% even 50% of total brand volume. By comparing this metric across brands in a category, one can easily identify those brands with high levels of exclusive usage.

Appendix B

The Embryonic stage

- **Data**
 - National and regional syndicated data only
 - Limited sporadic account level syndicated data
 - Walmart retail link data but no other retailer internal data
 - No syndicated diary panel data
 - Limited consumer data
 - Internal sales data by Account and SKU.
- **Analytics and software**
 - Standard Microsoft software for analytics (Excel/Access)
 - No software to assist in assortment, pricing or promotional analysis and optimization.
 - Limited analysis of promotional spending ROI using internal shipment and share data.
 - Rudimentary forecasting and supply chain software.
- **Organizational skills**
 - Category Management as a glorified sales analysis function.
 - Limited or no training in Category Management theory or practice.
 - No skills or training to develop assortment recommendations
 - No skills or training to operate shelf space management software.
 - Limited knowledge of promotional analytics theory or practice
- **Culture and process**
 - Inwardly focused culture valuing negotiating skills.
 - A siloed organization with the Category Management functions reporting to Sales.
 - Customer relationship is transactional aimed at optimizing short term internal objectives.
 - The retail customer is seen as an adversary to be overcome via tough negotiation.
 - No category-oriented process knowledge.
 - All processes internally focused, except periodic sales presentations and line reviews.

The Adopting stage

- **Data**
 - Comprehensive syndicated share data for all major accounts, channels and regions.
 - Limited data on basket size and pricing.
 - Limited household diary panel metrics on category and brand household penetration, purchase frequency, transaction size, and promotion lift data by type.
 - Walmart retail link data with an analytics package.
 - Periodic exposure to major account loyalty card data.
- **Analytics and software**
 - Industry standard shelf management software.
 - Third party syndicated tools to assist in price and promotion analysis.
 - No third party data management software to manage or analyze disparate data sources.
 - No loyalty card analytics capability.
 - Standard Microsoft tools to manage and analyze diary panel data.
- **Organizational skills**
 - Some staff training from third party trainers but no comprehensive training or certification.
 - Category analysis limited to basic reviews of major accounts and category segments.
 - No deep dives into syndicated data such as Spectra.
 - Some limited knowledge of efficient assortment concepts but no internal development of assortment rationale.
 - Basic knowledge of planogram software but no capability to manage multiple planograms.
 - Price and promotion analysis limited to basics augmented by third party data suppliers such as Nielsen.
 - No ability to develop best practice tools such as 'Voice of the Shopper' or a Category Management platform.
- **Culture and process**
 - Focus is external on key accounts and shopper response to spending initiatives.
 - Limited theoretical understanding of key Category Management concepts such as category segmentation, role, and scorecard.
 - Team has developed some assortment and shelf merchandising recommendations in response to sales account managers' requests.
 - No category captaincies at any retailers, rarely consulted by retailers for input to retail category plan.
 - Internally viewed as arm of sales with links to some tactics important to marketing, logistics, and forecasting.

The Advancing stage

- **Data**
 - Sophisticated category segmentation with research support
 - Comprehensive share data by segment at channel and major account level
 - Some cross category purchase behavior data
 - Syndicated data on brand and type loyalty
 - Heavy user demographics and behavior data
 - Shopper response to price promotion and display, trip mission and trigger data
 - Some retailer loyalty card data access
 - Basic store and aisle transit patterns
 - Store level planograms by major account and store cluster demographics
 - Some syndicated retail space profitability (ABC/GMROI) data.
- **Analytics and software**
 - Assortment optimization analytics
 - Access to syndicated service pricing elasticity analysis
 - Access to syndicated service promotion ROI analytics
 - Advanced shelf management software offering space and replenishment optimization planning.
 - Loyalty card analytics access.
- **Organizational skills**
 - One third of all account team members and HQ Category Management staff has completed formal training and been certified by the Category Management Association's protocol.
 - Some personnel have high level skills in data manipulation with Access.
 - Some personnel familiar with common ethnographic research techniques.
 - Some personnel familiar with various statistical and mathematical techniques such as Markov, Discriminate function, conjoint analysis, and Van Westendorp.
 - High level familiarity with ABC costing and GMROI calculation formulae.
 - Basic understanding of assortment theory and planning.
 - Ability to develop and manage planograms using advanced third party software.
 - Able to develop and present line reviews.
 - Deep understanding of retail operations and planning.
- **Culture and process**
 - Viewed as key link between marketing and sales
 - Included in annual planning and especially account planning process.
 - Major contributor to line reviews and building account level sales stories.
 - Team has won category captain designation in half of key accounts.

- Present at all key internal account planning and at all account presentations.
- Interacts with product supply forecasting team.
- Considered authority on all shelf merchandising issues and on account level promotion response issues.
- Maintains shelf planning for several major accounts.

The Excelling stage

- **Data**
 - Sophisticated category segmentation data including need state based approach
 - Comprehensive knowledge of retail format performance metrics, costs, margins, etc.
 - Complete diary panel data by major account and region yielding segment and brand loyalty, exclusivity and shopper worth.
 - Category and brand leakage and closure data by channel and major retailer.
 - Knowledge of comparative metrics for other major categories in various formats.
 - Comprehensive planograms and assortment by store/cluster.
 - Robust 'Voice of the Shopper' and comprehensive best practice Category Platform
 - Loyalty card data from all major accounts
 - Shopper insights by major channels and accounts
 - In store shopper dynamics by location.
 - Advanced activity based costing data from syndicated source and from major accounts.
 - Comprehensive knowledge of basket value and cross purchase issues by major categories.
- **Analytics and software**
 - Advanced assortment analytics by total store, aisle and allocated category space linked to predictive analytics on to supply chain.
 - Three-dimensional shelf and aisle modeling capability.
 - Activity based costing for category, brand and items
 - Advanced loyalty card analytics capability by shopper behavior and groups
 - Individual store level supply chain analytics to reduce out of stocks
 - Advanced basket and shopper purchase analytics by category and broader need state
 - Shopper card analytics by store and category most valuable shoppers.
 - Success models for assortment, shelf merchandising, pricing and promotion by format.
- **Organizational skills**
 - All account service personnel certified by third party industry standards.
 - High level insight development skills.
 - Ability to build category strategic stories for retailers
 - Familiar with retail space customization models for various formats and demographics
 - Understands retailer strategies and implications for category and brands.
 - Extensive knowledge of retail format strengths by category.
 - Able to add value at highest level discussions with retail leadership.

- **Culture and process**
 - Category Management function is contributor across company demand and supply chains.
 - Category Management is key contributor to account planning and all in-store tactical issues.
 - Category Management owns the Voice of the Shopper and Category Management platform tools.
 - Works in multi-functional teams on insight development and path to purchase shopper marketing planning.
 - Primary contact with retailer on in-store operational issues, especially links to shelf merchandising and supply chain.
 - Intimately familiar with retailer strategic and tactical planning approaches by store cluster and shopper segment.

The Aspiring stage

- **Data**
 - Detailed shopper loyalty data by account and shopper segment
 - Household level shopper planning data from digital panel
 - Household level attitude and behavior data from detailed touch point database;
 - Brand and type preference and behavior by format.
 - Detailed cross purchasing leakage and closure data by account and format.
 - Need state attitude and purchasing behavior by format and account.
 - Brand switching data across formats, price elasticity by format and account
 - Promotion response by shopper segmentation and account.
 - Total store space optimization effect on company categories by retail format, account and clusters within accounts.
- **Analytics and software**
 - Path to purchase ROI optimization by shopper segment, format, and brand.
 - Assortment optimization by format and account at individual store level.
 - Price elasticity optimization by shopper type and format, in store product location and adjacency.
 - Overall need state adjacency optimization
 - Promotion type and timing optimization
 - Individual shopper shopping list optimization capability.
 - Individual store level supply chain optimization with communication link to store operations.
 - Total store aisle and display location optimization.
 - Ability to incentivize shopper in real time by aisle and by store.

- **Organizational skills**
 - Active promoter of strategic interchange between retail strategists and brand marketing.
 - Capability to link loyalty analytics and communication data by household to develop planning insights at retail level.
 - Major contributor to improved shopping experience, especially reducing in store out of stocks and supply chain hiccups.
 - Major contributor to format strategies, need state planning, and execution at retail.
 - Clear authority on category in eyes of retailer.
 - Company is category captain in all target accounts across all major formats.
 - Has ear of retail and company management on in-store experience and trend identification.
 - Understands retail management's shopper segment management strategies and role that company's brands can play.
- **Culture and process**
 - Owns responsibility for in-store planning and executional excellence.
 - Owns responsibility for all in-store response analytics.
 - Responsible for deploying insights at retail.
 - Critical communication link between marketing and sales, logistics and store.
 - Integral contributor to brand planning and logistical planning.
 - Owns Voice of the Shopper maintenance and internal communication.
 - Owns Category Management platform and all format modifications and upgrades.
 - Leads identification of in-store experience research needs.
 - Responsible for in-store experience improvement recommendations.