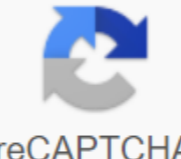


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The holy grail of retailing, being able to offer the right product in the right place at the right time at the right price- remains woefully elusive. You'd think we'd captured it by now, especially given the huge amount of data that retailers and electronic tails can collect about shopping points, buying models, and customer tastes. But many retailers still have a long way to go. Witness the widely advertised problems that electronic tailings stores have been delivering products that customers order on their websites. And who didn't go to the store just to find that it didn't have the right item, even though the place is loaded with inventory, mostly discounted goods? Department store margins rose from 8% of store sales in 1971 to 33% in 1995. These figures include advertising mark-ups as well as forced mark-ups that are the result of oversupply of manufacturers. But the increase is so large that most observers take it as a sign that retailers are having a hard time matching supply with demand. This does not mean that progress has not been made. Some retailers (we will refer to retailers and electronic tails from now on with a broader term) have dramatically improved their performance in ordering, distribution and merchandising. But these companies are still a small, elite rank. The next step? An industry step toward what we call rocket-building retail is the act of mixing traditional forecasting systems, which are largely based on the intuition of a handful of employees, with the skill of information technology. Rocket retail combines data and instincts with computer models and analysis to create a high-tech forecasting system supported by a flexible supply chain. The model is not as far-fetched as you think. Wall Street went through just such a transformation in the 1970s. (See the sidebar it happened on Wall Street.) And we've seen how many retailers have been very close to achieving rocket science status over the last three years, as we've studied how they collect and process information, how they forecast demand, and how they manage their relationships with suppliers. For those immersed in day-to-day retail activities, the movement towards rocket-building retail can seem overwhelming and the challenges insurmountable. But consider a similar movement on Wall Street in the late 1970s, when several ingredients came together to transform the act of investing from art to science. The first ingredient was information technology, which had the power to capture, store and analyze trade data, even to the point of programmed trading, in which computers traded against other computers, use any arbitration opportunity that may remain open for a few seconds. The second ingredient was new models and concepts from academia that provided the basis for the analysis of all these And third was a new breed of Wall Street staff who left behind a career in science and a man of growing science optimized investment. Today, these same ingredients are ready for the form of retail. It may seem like a stretch to draw a parallel between a retailer and a Wall Street investment firm, but believe both should analyze transaction data, whether stock trading or product sales, to predict the next high-flying stock or hot product. (If you think predicting the performance of stocks is fundamentally different from predicting sales of fashion products, ask yourself whether the high valuation of online stocks was less of a fad than the fascination of consumers with Pokemon toys.) Both should invest resources - either stocks or stocks - in conditions of risk and uncertainty. And both must respond quickly to signals from the market. These elements are accurate, accessible data; Forecasting Risk-planning stocks and the speed of the supply chain is the backbone of retail. Pyramid illus-portrays how these retail supply opportunities challenge the right product at the right time and at the right price. We recently completed an in-depth multi-year survey of 32 generally advanced companies, in which we tracked their practices and progress in four areas critical to achieving rocket-building retail: forecasting, supply chain speed, inventory planning, and accurate, affordable data collection. In this article we will illustrate what some companies are doing best in these four areas, in the hope that other retailers can use their ideas and practices to get ground on the Grail. Forecasting For many retailers in our study, predicting demand for products is a function of the right brain that relies on the guts to feel multiple people, rather than on the systematic use of sales data. But it is a big mistake to overlook the opportunity to mix art and science. Retailers can significantly improve forecast accuracy by simply updating their forecasts based on early sales data, tracking the accuracy of their forecasts, testing the product correctly, and using different forecasting approaches. Let's discuss each of these practices. Update forecasts based on early sales data. Early product sales, appropriately adjusted for price and affordability fluctuations, are an excellent predictor of overall sales (see No Need for a Crystal Ball). In fact, retailers that use this data to plan production and inventory can more than double their profits, especially retailers with short life-cycle products such as clothing, consumer electronics, books and music. Sales data can help predict demand for a product lifecycle, especially a trendy product. Information to the right of the company's clothing catalog. Chart on the left section of the actual cycle lifecycle demand projections made by a committee of four merchandizers. Chart on the correct areas of actual life cycle demand versus forecasts based on sales observed during the first two weeks of the product on the market, which accounts for 11% of the demand of the season. The latter leads to a predicted error, which is much less than the forecast of experts. But despite the potentially high benefit, and the generally accepted belief among retailers that early sales are a good indicator of future sales-many of the companies we survey had no systems to use data on early sales. One retailer, for example, ordered clothes and pledged to have a certain amount of each stock storage unit (SKU) in each of its stores 11 months before the product became available to the public. Even retailers, who paid attention to their early sales data, updated their forecasts in a special manner, when sales significantly exceeded or fell short of the initial forecasts. Some companies have retail practices worth emulating, however. The Japanese World Company and the Spanish company zara are trendy retailers whose traders systematically study early sales data to assess future demand for various products. They perform this analysis for each product at predetermined periods in their sales cycle. And traders follow through, immediately reordering items that look as if they may end up in deficit. Unsurprisingly, the global company has achieved a gross return on inventory investments of more than 300% - a much higher return than any other retailer we know of. Dallas-based CompUSA, which sells computers and related products, found that even one or two days of early sales data can be very useful for predicting sales and restocking for PCs. Buyers monitor sales of a certain product line shortly after its launch and update their forecasts based on these observations. They speed up orders for PCs that are selling better than expected, and when possible, they reduce items that have not been shipped. This process of reading and responding to market signals has improved CompUSA's ability to meet demand. Finally, book and music retailer Borders Group uses historical sales data to customize the product range in each of its stores. Borders tracks sales in each store by product category. It uses its product planning system to automatically adjust in-store inventory based on sales in each product category. Thus, the store in Anchorage, Alaska, will carry a wide range of books about small planes, because Sales of such books are usually high at this outlet, while the Boston store can stock relatively few items in this category because the demand there is lower. Why don't more retailers set up their stocks? The answer, as we will explain later, is slow supply chains, inadequate or data, the inability to measure inventory and forecast error, and software planning that is not appropriate for the seller. Tracking and predicting the accuracy of the forecast. Only nine of the 32 retailers in our study said they analyzed the accuracy of their forecasts. And yet, tracking forecast errors and understanding when and why they occur is fundamental to improving accuracy. More importantly, knowing the error of the forecast is vital in order to be able to react when the prognosis is incorrect. For example, if past predictions for a particular product were incorrect plus or minus 50% when the trader says that you will sell 10,000 of that item, it really means that you will be selling 5,000 to 15,000 units. Instead of buying 10,000, it would be smarter to buy 5,000 finished units and materials for an additional 10,000 units that will be assembled quickly if early sales are strong. The World Company tracks and predicts the accuracy of the item forecast using the Obermeyer method: new products are displayed in a room at the corporation's headquarters just as they will be in the retail store, and about 30 store employees who are selected to represent the company's target customers assess the likely success of each product. The world has found that products that cause great disagreement among employees probably have less accurate predictions. Get the product testing right. An impressive 78% of retailers in our study test new products in multiple stores prior to the actual product launch. But almost all customers said their testing methods were highly unscientific and that any results indicating that some products would fail were often ignored. Merchants often believe that their products will sell well despite unfavourable test results; they blame the weather (bad or good), poor selection of test sites, poor performance tests and other factors for suboptimal sales. When a product testing method is developed with caution and is improved on a regular basis, results can significantly improve predictions. We helped develop a testing method in one clothing retailer that predicts product sales based on early sales in several carefully selected test stores. We found that the choice of stores strongly influenced the quality of forecasts. Using historical sales data to select a diverse group of test stores that matches different customer preferences, we reduced forecast errors for each style and color from 30% to 3%. Use different approaches to forecasting. Most of the companies we survey are limited to type of forecasting. Typically, one forecast for each item is generated by the buyer or a small group from merchandising. But creating multiple predictions can be very valuable because in an effort to understand the differences in these predictions, managers can examine the assumptions implied in their forecasting methods. Take the Old Navy, Navy, Space. The company combines bottom-up and top-down approaches, and then looks at the results in a way that costs them. Bottom-up forecasts are developed by merchandizers and planners who predict demand for each product based on factors such as current market trends, product fit to the target customer, and additional products that will also be offered. Top-down forecasts are developed by planners and occur independently of the bottom-up process. They are based on macroeconomic factors, such as economic growth rates and corporate growth goals. These two approaches tend to produce different results, which were agreed upon during the meeting of the leaders of both groups. The old navy believes that different processes, and subsequent discussion, lead to substantially better predictions. Supply-chain Speed Many products today have such long lead times that retailers can't call for a change in production, even if they've tracked early sales, paid attention to product testing, and know without a doubt that change is warranted. As one merchant told us: We will really pay attention to our tests. The problem is that we already own the product. The test just shows that it will be a dog as soon as it gets to the shops. Another retailer maintains an 11-month period from placing an order to getting clothes in a distribution center, even for products with a life cycle of just three months. Therefore, buyers must commit to an order from one vendor before any sales data is received. They must also specify how much each product will be delivered to each store 11 months before the material is received at the distribution center. The speed of the supply chain is certainly an essential component of rocket-building retail, especially for products with short life cycles. A company that can observe early sales and react quickly with any relevant additional items can obviously reduce the likelihood of selling out hot items. It can also reduce mark-ups because its ability to respond with more products during the season means that the retailer can order less initially and reduce its losses on products that turn out to be failures. The world and zara use similar exemplary practices in this area. Think about how the world manages its supply chain. It can produce and deliver an existing product to stores within two weeks. It can develop a new product and deliver it to stores in just three weeks. How does a company achieve such a short response time? First, the World does a significant amount of work with partners supplies before he even places an order. The company stores fabrics and finds (buckles, zippers and so on) and reserves production facilities at the plants in anticipation of demand. At the beginning of the sales season, the World, like most retailers, is difficult to predict the sale of each product. It's This, that inventory of finished products is risky. But the company considers it relatively safe to hold raw materials and reserve production capacity, as forecasts for these materials are generally more accurate than forecasts for finished products. Secondly, the world's factories are eliminating production problems, separate from the main production area. Employees in the debugging area work closely with designers in the World corporate office, changing product design to facilitate production and, at times, replacing hard-to-reach raw materials with more readily available products. Thirdly, World has enabled its employees to develop their own products, merchandising, operations and stores, thus avoiding bureaucratic delays that can accompany the decision-making process. For example, the decision to design, price, purchase materials, and produce a new product in World typically involves meeting five or six department heads who work in neighboring offices as a cross-functional team. In other retail stores, such a meeting may involve convening managers located in different cities, and may mean getting approval from managers at different levels of the organization - a more time-consuming process. Why aren't other retailers as responsive as World? One of the common problems in many companies is the effectiveness of the mentality. For example, an 11-month clothing retailer insisted on placing orders on individual stores instead of buying in bulk for all stores, and then strategically distributing goods to various stores as soon as the materials arrived at the distribution center. The retailer has reduced shipping costs and inventory transportation costs in stock, but has limited its ability to respond quickly to market signals. One distribution center manager told us about a video his company had produced, illustrating how distribution efficiency can be improved. The video showed how quickly warehouse employees can collect clothes for shipment if they collect and pack reorder in the same size combination, no matter how many large, medium and small items a separate store requires. The video also showed how long it took warehouse staff to collect orders, when the size of the mix for each store varies depending on its need. The distribution manager and his colleagues were confident that saving time of a few seconds for clothes would convince store managers that all reordering should be shipped in the same size. Who asked our question to the manager: How long will it take you to handle clothes that come back from stores unsold because you haven't sent What do they want? Rocket science retail includes the marriage of the left brain (scientific) and the right brain (intuitive) thoughts and workflows. For some retailers, this means that a data-oriented planning organization in addition to its traditionally creative buying and merchandising operations. Many retailers fall into a vicious circle. Representatives of the logistics and procurement department argue that reducing the storage time of products will not help the retailer, as the company does not have good sales data and tools to analyze this data. Product planning officials say the ability to store and analyze sales data will not help the retailer, as logistics and procurement cannot respond quickly enough to these signals. The problem is that companies can't quantify the value of short lead times in shrinking stocks and mark-ups. But as retailers adopt new software to predict and plan deliveries, they can use these tools to measure the impact of shorter use time and for better time, with the supply-to-demand supply. Inventory planning involves deciding when and how much to order, or how much to produce, various raw materials, components and finished products. Inventory planning differs from forecasting in that it may be useful for a planner to have a stock of more or less projected demand. When planning inventory for the household, for example, you may decide to stock up on far more medications than you expect in case you get sick. Or you can buy some items - batteries, such as months in demand at a time, while other items, such as bread and milk, can be ordered every week. Stock planning in most retailers suffers from a number of flaws. One of the most egregious is that many retailers do not track stocks and as a result have lost sales. Only 13 of the 32 companies in our study said they tracked inventories, and 11 of the 13 used this information to evaluate lost sales results. Lost sales are endemic among retailers, especially for products with short life cycles. Stock tracking can help retailers establish optimal inventory levels and help them see value in improving supply chain responses. So why aren't these indicators thoroughly studied? One reason is that it is difficult to know how much product would have been sold if supplies had been abundant. The figure can be estimated using complex statistical methods, but retailers generally cannot find such opportunities in commercial software, especially in the case of short life-cycle products. There is a way through this obstacle. We have developed a method for estimating lost sales. Our procedure works in two stages. It calculates the base rate of demand for a product based on the sales patterns that occurred when the product was in stock. Secondly, it combines the estimated demand rate with the length of stock in a particular store to generate lost sales. To assess the level of demand and lost sales, the method must be changed for factors such as changing demand on different days and in once during the day. In our experiments with real retail data, our technician estimated lost sales within 2% at the store level and with higher accuracy at the chain level or for the product category. The benefits of tracking lost sales and systematically raising inventory levels to reduce these losses can be significant. One retailer found that sales could be improved by about 10% simply by increasing inventory in stores, suggesting that lost sales - before stock increased - would account for at least 10% of sales. In Rome-based jewelry maker Bulgari, stocks per item in one store were high enough to reduce store revenue by 3.5%. As a result, Bulgari is looking for ways to improve its planning processes. Accurate, available data All retailers in our study have a Tone Sales System (POS) and used them to collect sales data electronically. But contrary to popular belief, most retailers have considerable difficulty collecting and maintaining sales data that are accurate and accessible to their employees. First, let's look at the accuracy of the data that retailers collect. Store-level sales data are often inaccurate for several reasons. In the garment industry, the general source of data inaccuracies arises as a result of mishandling of returns. When a customer buys a medium sweater and then wants to exchange it for a small one, the returned clothing must be scanned in the register as a refund, and the requested clothing must be scanned as a new purchase. In fact, the seller, trying not to cause inconvenience to the customer, exchanges the clothing environment for small clothes without scanning both items in the POS system. As a result, the inventory levels of both items are inaccurate. In the grocery business, the huge volume of transactions confuses the grocer's ability to maintain accurate sales and inventory information. Most consumers can tell about a situation in which they bought multiple units with the same price (such as a container of lemon yogurt and a container of vanilla yogurt as the same brand) and the cashier's clerk scanned one of these items several times. Obviously this will lead to an inventory of lemon and vanilla yogurt to be inaccurate. One grocery chain found that sales of medium tomatoes were consistently 25% higher than the actual shipment of medium tomatoes to their stores. Making clerks often entered into their registers the price of inspection (PLU) code for medium tomatoes, even if the customer was buying organic, grape ripen, or other specialty tomatoes. If it's red and soft, it's the average tomato at the till, notes the CIO at this supermarket chain. Most clerks want to spend extra time to check the PLU code accurately and risk upsetting the customer and their manager, which, in many cases, is the average speed at which cash clerks scan units. Of course, not all inaccuracies of data are caused at the box office. One retailer in our study found that inventory records were inaccurate for 29% of the items in the store that was stocked but which is not yet open to customers. The retailer tracked the problem to its distribution systems; Warehouse employees often sent the wrong item (for example, sending small shirts instead of medium shirts or sending one flavor of yogurt instead of another). Similarly, errors were caused when changes in supplier packages - the number of items sent to the box - were not promptly introduced into the seller's top-up system. In one case, the vendor changed the size of its case package from 144 units to 12 units; the restocking system, unaware of the change, asked the warehouse to send only one case package. Many retailers do not know whether their information is inaccurate because they do not track the accuracy of the data. Other retailers monitor the accuracy of the data, but the information found is not widespread. At one clothing retailer, merchandisers and planners had no idea that their POS data was inaccurate, although the vice president of planning, through periodic audits, concluded that an error in inventory data was close to 30% at the store level. Many retailers do not know whether their information is inaccurate because they do not track the accuracy of the data. Some retailers have taken steps to ensure the accuracy of sales and inventory data. One interesting approach, zero-balance walking, is practiced at the office-delivery supermarket Staples. In this system, an employee walks around the store every day in search of SKUs that are out of stock. For each item that is out of stock, a stock card is generated and the sticker is placed in the space reserved for the item. Other employees check events - sudden spikes in consumer demand, computer data errors, goods stocked in the wrong aisle, and so on, which caused a sell-off. If the stock was caused by faulty data in the computer, the inventory level in the computer system is corrected. Performing a zero-balance walk every day helps measure and improve the accuracy of the data at Staples. Now let's look at the availability of data. The retailers we surveyed varied in their ability to store and access sales data. The average retailer in our study kept sales data for two years available on the Internet. One company kept only six weeks of data for its employees; on the other hand, another company kept ten-year sales data available online. Our official research into rocket retail began after discussion retailers that collected large amounts of consumer and sales data but struggled to use them effectively. We decided to start a study to document the current merchandising and practices among retailers. We felt that once we had a good understanding of the retail supply chains, we would be able to determine how they could be improved. Our vision of scientific or rocket-science retailing was shared by the Sloan Foundation, the large number of retailers that supported the study, and numerous students and scientists in various schools who made a significant contribution to the project. For our survey, we chose mostly retail innovative, short lifecycle products such as fashion clothing, shoes, toys, jewelry, books, music, entertainment software, consumer electronics, and PCs. We thought that the unpredictable demand for these products would make them the most difficult cases for retailers. We have worked with retailers through site visits, written surveys and annual conferences to understand their forecasting and supply management processes. The following retailers took part in it. Clothing and Footwear - David Bridal, Footstar, Gap, G. H. Bass, Maurice, Nine West, Limited, World Company, and zara. Consumer Electronics and PC-CompUSA, Office Depot, Radio Shack, Staples, Good Guys, and Tweeter etc. Books, compact brands, jewelry, toys, themed stores-borders group, Bulgari, Disney Store, Tiffany Company, TransWorld, Warner Brothers, and snee-brainy. Other product categories and multiple product categories are Ahold, Christmas Tree Stores, CVS, Federated Group, ON Butt Food Company, Iceland Frozen Foods, J.C. Penney, Marks and Spencer, KVC, and Sears. People often wonder why it is valuable to keep the sales history over the years, given how quickly trends are changing. In fact, the data provides useful information about sales models that remain stable year after year, such as seasonality, consumer reaction to promotions, and differences in sales models in different stores. We also found that the average forecast error is usually fairly similar year after year, even if the products have changed almost completely. Predicting product sales is much more difficult for traders in companies that don't have enough online data. In retail, where online data is just six weeks away, merchants have cited large stacks of paper copies of sales data from previous years when assessing future sales of products. Given that the cost of storing computers has plummeted, there is no reason for retailers not to store sales data electronically and make it easily accessible to their merchants. Those who either don't see how data can be useful in making decisions, or made a decision a few years ago when storage space was very expensive. Some retailers don't even make the latest sales data available at a detailed level. For example, some clothing retailers track their sales according to style, color and size (each has its own barcode), but they only store style and in the central computer. Thus, the merchandizer may know how many red blouses in a certain style were sold in a particular store on a certain day, but not if these units were sold in small, medium or large. Is it any wonder that a recent survey found that one in three consumers who enter a clothing store intending to buy something to leave without buying because he or she can't find their size in stock? Managers of these retailers claim that there is little value in knowing sales by size, as their suppliers and distribution centers can only supply in standard size packages, which excludes setting up a size range by store or region. Meanwhile, it is difficult to justify changes in their transportation and storage systems that would allow them to customize their deliveries because they do not have appropriate sales by the size of the data that would tell them how to do it. This is a perfect example of the vicious circle these retailers fall into: an inflexible supply chain justifies bad data that justifies an inflexible supply chain. Costs, Customer Satisfaction, and Morality We outlined current best practices, and ongoing best-case scenarios for the four areas that are fundamental to achieving rocket-building retail. But there are other areas of improvement for retailers who are eager to get closer to the Grail. Many of the issues we raised related to indicators such as forecast accuracy, inventories, lost sales, gross margins, mark-ups and inventory costs. But retailers also need to keep track of the variables that drive these measures. For example, which products and market segments have inaccurate forecasts and how does the accuracy of forecasts change over time? Only then will retailers have the information they need to get in the root cause of retail problems, solve them, and improve productivity. Some retailers also pay too much attention to the short term. Pressure to immediately improve profits can encourage cost reductions, leading to customer dissatisfaction and low employee morale. Senior managers of one of the retailers in our study have been challenged by the council for achieving double-digit profit increases every year. Management has achieved this goal by reducing costs by reducing the number of sellers in stores. The board was satisfied with the short-term profit growth, but the decline in the number of customers quickly reduced customer satisfaction and employees were dissatisfied. To prevent this kind of problem, retailers must clearly and accurately monitor customer satisfaction and employee morale. At least one retailer in our has engaged an external auditing firm to measure these factors, and the company is even considering reporting results in its annual reports. This approach makes sense. Without hard numbers on customer satisfaction and employee morale, these factors will take a back seat to cost reductions. In the long run retail would be worse off. Marriage of Art and Science Usefully consider the long-standing conflict between left-wing brainers, the technical types who either produce or rely on information supplied by technology, and right-brains, those who rely more on intuition. The core of rocket-making retailers, as we have already said, includes the marriage of two. And many retail executives recognize the need to mix the capabilities of the left and right brain, especially in planning. According to this view, their organizations have a left-brain planning organization in addition to traditionally right-brain buying or merchandising organizations. The planner usually looks at sales data - in the absence of software systems - to determine the number of stockings at the store and SKU level. The buyer tries to go beyond numbers and history and focuses on right-brained tasks such as identifying changing patterns of consumer demand and developing new products. The separation of skills and responsibilities between buying and planning seems to work well in most retailers. In other areas, however, there is ample room for improvement; a good example is the relationship between the management information systems group that supports the company's computer systems and other departments such as merchandising. One retail CEO says, The only time MIS managers talk to me is when they ask me to write off \$30 million for some previous project that I now have to give up. Another CEO chastised us for not appreciating the gap between MIS merchandising; You guys didn't understand, merchandising and MIS relations are broken. Most MIS professionals are not experts in products or merchandising. They are experts in information technology, such as database management and computer networks. Before joining the retailer, they may have worked for non-religious companies. Consequently, they do not always understand the needs of merchandising. In many cases, even language differs significantly between the two groups. One group of MIS in one of the leading retailers found, much to the surprise, that when traders in the company speak always, as in I always follow this procedure, they mean 75% of the time. This shocked the literal-minded MIS group, for which always means 100%. It is unclear how the relationship between MIS and merchandising will develop. But we don't see how merchandising can become scientific without understanding each other by two factors. Systems at the heart of it rocket-building retailers ever happen across the industry, retailers should pay more attention to the logic that is built into their planning systems. Most retailers for example, understand that inventory levels should be lowered by the end of the product lifecycle and that forecasts should be updated based on early sales data adjusted for product availability and price fluctuations. But most inventory planning software is designed for products that have a long life cycle and are thus not suitable for products that have an economic life of just a few months. Marshall Fischer and Kumar Rajaram, Accurate Testing of Retail Fashion Products: Methodology and Application, Marketing Science, No. 3, Summer 2000. Marshall Fisher, Anant Raman, Janice H. Hammond and Walter Obermeier, Ensuring demand satisfaction in an uncertain world, HBR May-June 1994. Anant Raman and Giulio Sotteri, Technology Assessment of Retail Demand and Lost Sales, Harvard Business School Working Paper, 2000. Sports Obermeyer Ltd., HBS Case Study #9-695-022. Consider, for example, a directory retailer that recently bought a new software package to plan stocks of short life-cycle products. The company was advised to set the system parameters to stock up on four-week projected demand for each SKU. For these products, however, sales usually peaked in the first week and then declined exponentially. This meant that the four-week stock ordered by the system was based on inflated sales. It is inevitably too much inventory and often generated outdated goods at the end of the product lifecycle. Moreover, most inventory planning systems typically require two to three years of demand history, on the basis of which forecasting and stocking parameters are modeled. This is a problem for many products whose life cycle is measured in months. Some software vendors are beginning to address this issue, and we are confident that the appropriate system will be developed soon. Retailing rocket science will require the development and use of decision-making support tools. In the past, many retailers who tried to develop such systems in-house or purchase them from third-party suppliers were disappointed; systems did not use proper mathematical methods and therefore produced poor results. The mathematical methods underlying such decision-making support systems are not simple for a number of reasons. Consider the task as simple as using early sales data to guide top-up; See what sells well and get more if you can. But the implementation of this concept requires careful attention to detail. For example, it is important to know not only how much a product has been sold, but also the conditions under which it was sold, including the price and availability of inventory. This point is well illustrated by one retailer who developed a recharge model based on early sales data. The model showed that the product in the same style and color sold almost twice as much as predicted. On the basis of this, a large order for replenishment was placed. The vice president of merchandising who placed the order was dismayed to see sales in the next three weeks in the fall 60% of what the model predicted. She was convinced that the model was flawed. However, a thorough examination showed that sales were slow, as the delivery

of the product, which was expected at the time of the order and which was made by the model, was delayed for three weeks. So the shops were stocking out of many sizes. As soon as the fresh product arrived, sales recovered to the level projected by the model. The basic principle is simple: you can't sell it if you don't have it in your inventory. But retailers often overlook this principle when they interpret sales data. Retailers can't continue to suffer the growing markup losses yet disappoint a significant portion of their customers who can't find what they want. They cannot continue to ignore the billions of bytes of an untapped sales history that could help solve these problems. Somehow this vacuum will be filled. Every decade a retailer that innovates so powerfully that rewrites the rules for other retailers and for all retailers. In the 1980s, it was Wal-Mart. In the 1990s, he Amazon.com. We believe that the next retail innovator will be the one that best combines access to consumer transaction data with the ability to turn that information into action. A version of this article appeared in the July-August issue of Harvard Business Review for July-August 2000. Reviews. ready or not full movie online dailymotion. ready or not full movie online watch. ready or not full movie online with english subtitles. ready or not full movie online hd. ready or not full movie online stream. ready or not full movie online free hd. ready or not full movie online watch free. ready or not full movie online eng sub

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