

Evolution of Organized Grocery Retail: Space Management Perspective

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I. INTRODUCTION

Retail space being the most expensive real estate in the world (Kaikati and Kaikati 2006) the need to manage it wisely evolved with evolution of retail globally (Berman, B., & Evans, J. R. 2013). Early retailers generally believed that display exposure is the only factor influencing unit sales so they were manipulating shelf space to increase visibility for higher sales and profits (Ronald C. Curhan 1972), later researches proved the equilibrium point is reached and after that the visibility alone ceased to generate sales (Bitner, M. J. 1992) and other factors started to influence and gradually the field of space management turned more scientific.

The retail space utilization especially for grocery in supermarkets where normal household is exposed to over 1000s of different item SKUs in all colors, sizes, flavors, price points, brands and lots of other variables created utter chaos and confusion, In the context of grocery retail, this means that while variety is essential, too much of it can overwhelm shoppers. (Schwartz, B. 2004) These foundational questions—what to sell, how much to buy, where to keep, and how to make it available—are critical in transforming what could be an overwhelming array of choices into a coherent, efficient retail operation that meets consumer expectations. (Berman, B., & Evans, J. R. 2013).

Further retail evolution raised more complex questions like Who to sell, How to price, How to promote and communicate value, How to integrate channels, How to measure and Adapt, Drivers and Enablers of Digital Transformation and finally How to optimize customer experience. (Hagberg, J., Sundström, M., & Egels-Zandén, N. 2016).

This research paper tries to dive deeper in understanding how the retail evolved in terms of space management to optimize retail efficiencies and customer experience. The retailers have ever trying to be differentiating themselves from the competitors, and share the concept of The “Store as a brand” & emphasizes the transformation of retail stores into distinct brands themselves, rather than merely being venues that sell products from other brands (Mcgrath, 2005). Departmental stores and boutiques had always appealed to public’s imagination in a very sophisticated manner, integrating atmospheric aspects into store. These retail ‘microcosms’ offered their customers advice, service, warmth and exclusivity. (Katelijn Quartier 2016)

The earlier retail stores were master class in terms of architecture and interior, designed for classy fans from flamboyant backgrounds to attract and seduce people into entering and strolling around the store. (Katelijn Quartier 2016). Natural light used to be the main feature even after the electricity was invented, the stores were in the form of galleries and these galleries were transitional space that directed the customer’s movement and attention (Henderson-Smith, 2003). This development created the concept of ‘customer routing’ the route the customer is supposed to take or smartly forced to take in a retail format (Kent 2007), this further helped the store planners to design and develop retail store layout and floorplans. Goods were categorized and themed based on the living spaces in people’s homes giving rise to the idea of ‘departmentalization’ and this further developed in the merchandising term into ‘product categorization’. The idea of departmentalization not only helped the customer orientate but also it tempted them to buy more than intended (Henderson-Smith 2003).

Evolution of Visual merchandising also dates back to eighteenth century London when the product display was itself enticing the customers to purchase rather than a salesman actively selling it. The further developed into creating extravagant mock-ups, showing the way in which the products should be used, the use of lifelike mannequins for fashion, model rooms in the home furnishing departments even a mockup railway coach to present travel accessories and so on (Katelijjn Quartier 2016) For grocery retailers the competition was fierce and the fringe elements gradually took the backseat and more functional designs and cost effective means of cues for impulse buying and enhancing customer experience took the center-stage (Underhill, P. 2009).

For grocers the focus shifted to better assortment, lean supply chain, least spoilage, efficient order processing, improved lead time, on shelf availability and yet silent reminder and impulse sales at the cash counter. The most suitable assortment and where to place it for the customers to walk past and purchase and how to display it on shelf to be optimum in volume, facings, position and rank.

According to Oxford English Dictionary the term retail is defined as “The sale of goods to the public for use or consumption rather than for resale.” Worldwide the retail industry has been growing faster than ever, showing a consistent growth over the last 20 years. Interestingly, it is one of the largest industries in India and second largest employer after agriculture (Thirumal Azagan, C, 2015).

Retail industry is one of main driver of India's economy, Retail contributes 10 percent to the country's GDP and generating employment for 8 percent of the population. (www.investindia.gov.in - June2024) In recent years, the retail sector has witnessed phenomenal growth, propelled by factors, such as increasing urbanization, a rise in disposable income, improved logistics, increase in product offerings/assortments/SKUs, and digital accessibility for rural consumers. (India Retail Market Overview - Deloitte - June 2023). Presently, India is amongst the top five retail markets in the world and is expected to be the world's third-largest consumer market by 2030, after the USA and China. This growth trajectory demonstrates the immense potential and promising future of the Indian retail industry. (Future of Retail: Emerging Landscape of Omni-Channel Commerce in India - August 2024)

India is currently the fourth largest retail market in the world and the Indian retail market is expected to reach \$1.9Tn by 2030 India ranked#2 in Global Retail Development Index (GRDI), 2021 (www.investindia.gov.in - May 2024). The Indian retail market was valued at US\$753 billion in FY23 and is projected to post a 9.1 percent CAGR until FY27, the highest amongst large economies. This growth trajectory positions India as a frontrunner in the global retail landscape, with the second-highest absolute industry turnover growth projected in the Asia Pacific region

This research paper restated the internal dimensions of space management in terms of internal layout, customer route plan or floor plan, fixtures, way the products are displayed in store, location of departments and location of products with the departments (Iyer, 1989). This paper talks about product groupings and traffic flow apart from other internal factors and tries to find a research gap in Indian grocery retail context

Evolution from Indus valley to Silicon Valley

The concept of food retailing is around for over a thousand years recorded history, India has its retailing and trade dated back to the Indus Valley Civilization (Dennys Frenz 2023). Great amount of trade commodities and tools used by traders, such as seals and weights, as well as pottery containers used for the storage and shipping of specific goods were unearthed from Indus Valley. Earlier trade was happening through barter system and changed multiple times in its form, feature and operations ever since. During Buddhist era, after introduction of coins in India the rise kingdoms the concept of markets came to be known. (Ashish Kumar 2014)

Ancient markets and agoras can be seen in Greek history dated back to 1st century BC, the construction of complexes which sheltered different aspects of urban life (food selling, manufacturing, recreation and leisure, *etc.*) was a standard urban feature of all the cities and towns. (Evangelidis 2014)

Kautilyas Arthashastra (4) written by Chanakya in Mauryan period circa 350 BC, talks at length about the customer service, quality, fair trade practices and market regulations, Import/export, code of conduct and control mechanisms, In english translation of the book, by R Shamashastry (2015), he wrote a full

chapter on the variety and quality of gems, beads, blankets and fabrics apart from various manufacturing, warehousing and logistics operations those are upgraded ever since to be used even today. This book also speaks about customer service, import subsidies and seasonality of various commodities.

“The superintendent shall show favor to those who import foreign merchandise: mariners (*nāvika*) and merchants who import foreign merchandise shall be favored with remission of the trade-taxes, so that they may derive some profit (*āyatikshamam parihāram dadyāt*).”

According to retail Wikipedia the earliest known example of permanent retail shop front is Grand Bazaar, Istanbul (interior). Established in 1455, it is thought to be the oldest continuously operating covered market.

The history of somewhat organized retail in India dates back to AD 1672 when a month long yearly fair started in Meerut district of UP. *Nauchandi mela*, as it is popularly called, is held every year after the festival of ‘holi’ and attracts over a hundred thousand visitors. It had started with the objective of trading in animals, especially horses. Over a period of time, cattle trading was complemented by a multiple of activities of religious rituals, commercial, artistic creativity and rural gaiety. For centuries, such fairs and *melas* have existed across the villages and cities of India. Other than being a source of entertainment, such fairs were held with a specific objective of commerce. Those who produced surplus were given appropriate place to sell their produce. Later on specific *mandis* and gatherings started with sole purpose of trading. (Hitesh Bhatia; Daxay Soni 2012) (Christopher Alan Bayly 1983)

Chhatta Chowk Bazaar inside Red Fort, the royal mall for queens, concubines, princess and nobles of the palace is supposedly the first mall of India, although the bazaars in India were all open to air, but Shahjahan was inspired by the covered bazaars of Persia. (Richardson., A.E. 1954)

When these open markets transforms into shops can’t be said with certainty but there were shops reported in Pompeii in Ancient Rome, since there was no protection against robbery, the principle of lock-up establishment is supposedly evolved first among gold and silversmiths, drapers and craftsmen and these later on transformed into shops with customer walking in. (Colin Smith 2002)

In India, as well as other parts of the world, initially these developed as the centers of sale of a particular commodity, for example in medieval London like bakers were in bread street, milk sellers were in milk street or in Indian context curd was available in “*Dahi wali gali*”, flowers on “*Phool Chauraha*”, meat in “*gosht wali gali*”, seafood in “*machhli bazaar*” and so on, and these centers were easily attracting customers in the need of the said merchandise and thereby developed in all small towns of that era. (<http://en.wikipedia.org> April 24)

Seventeenth century In Europe, was the beginning of the real retail stores in their shape and forms, it was during this period when the architects were called to create large windows on the ground floor, much larger than the house windows, to showcase what is being sold inside, swinging signs and fonts were protected by posts to attract passers-by as customers, the products were said to be displayed in some organized way and retail space was utilized to some efficiency. (<http://en.wikipedia.org> April 24)

Eighteenth century seen the emergence of intermediate economy where the smaller towns (*Qasbah*) started seeing fixed markets bigger than village level *Haats* and smaller and less organized than large cities. Various traditional market settings in rural India, which may include references to smaller marketplaces akin to “*Gunjs*” or “*Bazariya*” and describes their significance in local economies and cultures. (Bandyopadhyay, S. 1999). e.g. *kanwari gunj, Afzal gunj, laal gunj, bada gunj, gunj bazaar, Pahad Gunj, Bazariya Dareeb* and many more in most of the North Indian small towns, these have shops selling very limited assortment of medium quality cloths, fruits, vegetables, spices and dairy products etc. At that time, *Ganjis* and *Qasbahs* had a major impact on the rural economy than *haats* did. (Ashirvad Deb 2011)

In London, and subsequently in the rest of the world, by the early nineteenth century, several markets commanded large and growing trades-retail and wholesale-and their capacity expanded through piecemeal rebuilding. There was an advancement in the physical appearance of markets as well. Also these were going beyond simple stalls and shambles. (Christopher Alan Bayly 1983)

In 1852, Bon Marche, the first departmental store was setup in Paris. Bon Marche revolutionized the retail

at that time by relying on volume rather than on high margins to make more money. This store also offered money back guarantee on purchases and by year 1890s the store reached the sale of over \$30 million worth annually. (Swapna Pradhan 2005)

In 1858, Mr. Bhutto Krishna Paul moved to Kolkata from Shibpur and established Bhutto Kristo Paul pharmacy with the help of a British officer Mr. Edwards. BK Paul developed medicine for Malaria and got famous by the name of the tonic, "Edward's Tonic", used even today and Biharis call it "*battis bimari ki dawai*" and BKP Pharmacy is presumably the first organized medicine shop, developed out of the Ayurvedic shop. (Ashish J Sanyal 1950)

During colonial era in India, seat of power, London was witnessing the paradigm shift in the presentation and customer service and these started reflecting in the Indian ruled princely headquarters as well as colonial large settlement headquarter. Crawford market was established in year 1869 in Mumbai, New Market in year 1874 in Kolkata, Connaught place in year 1931 in New Delhi these can be termed as pioneers of modern retail during those days. (<http://en.wikipedia.org> April 24)

Historically, the earliest retailers were peddlers who marketed their wares in the streets; however, by the 1900s, retail food sales in the United States had mostly shifted to small corner grocery stores. In that era, the standard retail grocery business model was for a clerk to fetch products from shelves behind the merchant's counter while customers waited in front of the counter, indicating the items they wanted. (Borsay P, Brown C, Tangires H. and James M. Mayo 1993)

In 1897, erstwhile Bombay was a burgeoning marketplace and traders were rushing in from everywhere two Gujrati brothers from Palanpur, Akbarally Ebrahimji and Taherbhai Khorakiwala founded Akbarallys, which transformed into India's first self-service organized retail outlet. They spotted the opportunity when three top British outlets closed down namely Whietaway and Laidlow, Army Navy Stores and Evans Fraser & Company. First Akbarally store stocked several items under one roof, the customers roam around freely without being interfered by the shopkeeper who was standing silently behind the cash counter. Once the shopping is done they bring their purchase to the counter and

get it counted and billed. So convenience and fulfilling. (Ashish J Sanyal 1950)

British during the World War II introduced "Rationing system" through PDS (Public Distribution System) to ensure food security during war and post war period, these are supposedly the first retail chains for India (<https://www.fao.org/4/x0172e/x0172e06.htm> April 2024). According to Business World, Marketing white book, the Canteen Stores Department (CSD) and Indian Postal services also forms largest network of retail outlets in the country. Khadi and Village Industries Commission (KVIC) setup in 1957 is even today selling organic foods under the brand name of "*Desi Ahaar*" apart from *Khadi* cloth and dhotis.

P.H.Nystrom, in his book Retail Selling and Store Management, in year 1911 mentioned: Store arrangement has come to be a science in itself. Every store manager must, of course, be interested in the problem of arrangement, while not a few individuals have made such a study of this work as to make their services valuable to others Trade papers maintain regular consultation staffs on this subject, and the future will see" this phase of retailing given much more scientific attention than in the past. (Nystrom, P.H. 1919)

In USA, Clarence Saunders, an American grocer, spent his life in developing a truly automated retail store, he is the pioneer in retail and was the first to develop the modern retail sales model of self-service. (Tolbert 2009, P 180) Clarence Saunders opened his first self-service chain of grocery store in 1916 under the name of Piggly Wiggly as a way to increase profits by hiring a fewer personnel and eliminating delivery and credit (Clarence Saunders (grocer) – Wikipedia April 24). In this arrangement the customers were trained to walk to the shelved in respective sections, pickup the price labelled merchandise and bill it without negotiations. This put the product and the consumer in immediate contact with each other. (Koch 2012)

These self-service stores were designed more for movement and picking up merchandise from shelves rather than standing and gossiping as used to happen in the unorganized market scenarios. Tolbert rightly mentioned these stores as one way street for movement not for conversation. Compared to dark and smelly corner grocery stores of the past these

self-service stores were bright and clean, offering full lines of national brands and viewed as acceptable place for women to go by themselves (Deutsch 2010, Koch 2012 and Tolbert 2009)

The first recognizably modern shopping mall was the Southdale Shopping Centre, opened in Minneapolis in 1956, London’s Royal Exchange, opened in 1568, fulfilled a very similar purpose. (Store wars 2012)

The history of modern retailing and organized retail in India began earlier than is often supposed. In 1971, India’s first “supermarket” was opened, in the form of Nilgiris at Bengaluru. Modern Indian retail incorporates the concept of self-service and includes a chain of stores that are operated with modern management techniques. In the late 1970s, the number of brands, especially of daily cosmetics and sanitary articles, increased sharply (Sengupta, A. 2008). This widening of the product range has intensified competition among manufacturers for shelf space in all retail formats (Martínez & Roels 2011).

India has highest number of retail outlets world-wide with average size of 50 – 100 square feet but per capita retail space is amongst the lowest in the world. For 50 years, time has stood still in that “Each shop is typically was about 10 square feet so that the proprietor can sit in the middle of the floor and reach his entire stock. (Westfall R. Boyd, H.W. 1960)

Grocery Retail – Functional creativity.

The Merriam-Webster Dictionary defines a grocery store as "a store that sells food and household supplies: supermarket". In other words, in common U.S. usage, "grocery store" is a synonym for supermarket. The Oxford English Dictionary notes that the term "grocery store" in American English is often used to mean "supermarket". Competition developed with many merchants selling the same assortment, initially it was only location, price,

ranges and quality and later it further evolved into ‘store’s personality or image’ – The way in which the store is defined in customers mind, partly by its functional qualities and partly by an aura of psychological attributes, wide range of intangibles like cleanliness and helpful staff. (Westfall R. Boyd, H.W. 1960).

Further on this developed into store of the community where like people shops, i.e. the store where you see your friends. (Anne M Findlay & Liegh Sparks 2002). This was the time when the layout and architecture of the retail stores first started making impact on footfall and sales. Women in modest income suburbs were asking for modernization with respect to appearance and comfort. The researches shows that inside the stores with high counters and displays, retailers started to hear comments like “they build up the display way over EYE LEVEL so that the things are staring at you and it bears down at you.” Or “On entering that store, the whole place was giving a feeling of crushing you” (Anne M Findlay & Liegh Sparks (2002)

The concepts of store planning and retail space planning were yet to be developed, the retailers were experimenting and collecting feedbacks and the chain retailers were continuously improving on the feedback from customer preferences and choices and use of technology started picking up, store ambience had become talk of the town, ladies started praising and comparing one retail store over the other and competition started between the retailers to excel through the use of modern fixtures, lightening, self-presentation, cleanliness, friendliness of clerks and the prices. (Basuroy, Mantrala & Walters 2001)

In his research paper, Clifford M. Guy (1998) discussed the dimensions used in classification of retail outlets: In classifying retail outlets, several systems have been used, each relating to some physical or economic characteristic.

Some dimensions used in retail store classification			
S. No.	Dimension	Typical Category	Origin
1	Geographical Location	Town center, edge, out, highway	(Christaller, 1966; Berry, 1967; Beavon, 1977; Beaujeu-Garnier and Delobez, 1979) (Reynolds and Schiller (1992)) (Reynolds, 1993)
2	Catchment Area	Neighbourhood centers, District centers etc.	

3	Development Type	Retail Park, Regional Shopping center	
4	Physical form	Cluster, Linear	
5	Development History	Planned, Unplanned	(Dawson, 1983; Dawson and Lord, 1985)
6	Store Size	Supermarket, Hypermarket, Kirana	The U.S. FMI food industry association, drawing on research by Willard Bishop Consulting and APFEDA India and Euromonitor, 1996 in Europe
7	Store Ownership	Indipendent, Franchisee, Multiple,	
8	Function	General, Specialist, Ancilliary	(Fernie, 1995; Fernie and Fernie, 1997)
9	Trip Purpose	Convinience, Household, Personal/Fashion	(Lord and Guy, 1991)
10	Goods Sold	Grocery, Apparel, Electronics, Multiproducts	(American Management Association - AMA, 1948) , (Brown, 1992, pp. 21–22)

Table 1: Taken from the research paper of Clifford M. Guy

Large-scale, organized and modern retail in India actually picked up post liberalization in early 1990s when the doors for foreign players were slightly opened and even the domestic players picking up the trend of the west and south-east Asia and Japan. Modern retail has become synonymous with self-service stores and organized with the function of management, technology used in various supply chain and merchandising processes scale is the size of business. (POPAI/DuPont 1978) After Nilgiris in 1970s it was Margin Free Supermarket setup in Kerala in year 1993, Foodworld supermarket in Chennai in 1996 and Food bazaar in Mumbai in year 2001.

Oxford (& Cambridge) English Dictionary defines a departmental store in 1980 as a large shop divided into different parts, each of which sells different things, where Saleh Malaihah, (1989) has quoted Mayfield (1949) defining it as a large scale store handling a combination of single line store in which each is operated as a separate department. Regardless of the specific definition, universal agreement on the specific elements of a departmental store states:

1. Departmentalization in both buying and selling
2. Large size
3. Wide range of goods

Competition in the industry pushes the organizations to create differentiation (M.E. Porter 2008) to stay ahead, more researches were conducted on key differentiations (store image and offerings) and physical environment and its impact on customers and in-store staff was studied. The ability of the physical environment to influence behaviors and to create an image is particularly apparent for service

businesses such as hotels, restaurants, professional offices, banks, retail stores, and hospitals (Baker 1987; Bitner 1986; Booms and Bitner 1982; Kotler 1973; Shostack 1977; Upah and Fulton 1985; Zeithaml, Parasuraman, and Berry 1985).

Researchers got overwhelmed with the rising complexity of retail as a business and started diving into the core and support functions of retail e.g. supply chain, marketing, customer service, store presentation, merchandising, inventory control, vendor upgrade to align with bigger picture and so on, this paper discusses more about the space planning and atmospheric aspects only.

Impulse Buying

Extensive research on impulse buying began in the early 1950s and sought to investigate those purchase decisions that are made after the consumer enters a retail environment. The DuPont Consumer Buying Habits Studies (1948-1965) provided the paradigm for most early research and defined impulse buying as an "unplanned" purchase. This definition was typically operationalized as the difference between a consumer's total purchases at the completion of a shopping trip, and those that were listed as intended purchases prior to entering a store.

Dennis W Rook in his work "Buying Impulse" published in Journal of consumer research in 1987, defined Impulse buying and separated it from Unplanned Buying. According to Rook, Impulse buying occurs when a consumer experiences a sudden, often powerful and persistent urge to buy something immediately.

The era of smart selling has begun and the operators and researchers started diving into shopper’s brain to convert the shopping into automated process and that is only possible if we give the shopper exactly what he is looking for and reduce the number of questions, comparisons and negotiations that has brought us to this date into the era of specifically intelligent unmanned convenience stores (IUCVS).

Organized retail has attracted researchers all over the world during 1950s but specifically in the USA where the researchers were diving deeper and were busy in finding the customer’s preferences towards:

- a) Cuts, chops, slices etc through matched lot tests (Gearder RO and Kline EA – 1959)
- b) Tree ripe peaches – customer’s reaction to its price (Evans HC and Marsh RS – March 1957)
- c) Customers reaction towards bulk and packaged displays in retail stores during summer months (Godwin MR 1951)
- d) Eggs and Poultry merchandising practices in New York (Goodrich DC Jr. 1958)
- e) Expanding the consumption of California honey - Survey of merchandising practices and retailers’ opinions about factors such as size of displays, location of display, and point of sale aid for honey in retail food stores. (Elsworth HM 1953)
- f) Merchandising dairy products – A store survey of methods of handling and selling of dairy products, with some attention to cost and efficiency of these methods. (Kirkwood EK and Blackstone JH May 1955)
- g) Trends in frozen food distribution in retail stores – A mail survey of chain store operators to gather information on display location, number of items stocked, number of brands stocked and other factors. (National association of food chains July 1951)
- h) Do small cans of food sells best on the top shelf? A test Vs control store study to study the sales effect of offering small cans of selected fruits and vegetables on the top shelf compared to the three lower shelves. (Pauli H and Hoeker RW 1952)
- i) Consumer acceptance of washed and unwashed potatoes as influenced by type of container. Matched lot tests including premium prices for

See table 2 below.

Typology of service organization based on variation in form and usage of the Servicescape	
Types of Service Organization based on who performs actions within the Servicescapes	Physical complexity of Servicescape

mesh bags. (Scott RC, Leed TW and Havas N 1953)

The studies were on to find answers to questions like ‘What do customers want from pork?’, ‘Apple colors – its development and sales appeal using latin square design’, ‘What kind of ham do people want?’

Knowing what and how the customer wants to buy, it was time to check on the environment. More than half a century ago, Kotler advocated the concept of retail store environment (1973). In addressing the vital role of the retail store environment in stimulating a consumer’s desire to purchase, the author highlighted the importance of store atmospherics, which is defined as the conscious design of a shopping environment to produce specific emotional affects that would enhance purchase probability.

Since then, a number of researchers have investigated store environment variables, including the effects on store behavior of in-store factors such as music (Milliman, 1986), color (Bellizzi & Hite, 1992), store space (Markin, Lillis, & Narayana, 1976), and music, lighting, and social interaction (Baker, Dhruv, & Levy, 1992).

In general, a large part of retail activity is still linked to the physical environment. The physical store remains the main distribution channel for retail companies and is an important source of competitive advantage. L.W. Turley & Jean-Charles Chebat (2002) studied the relationship between the strategy of retail establishments, the design of the retail environment and the resulting buying behavior. They underscores the necessity for retail managers to have specific goals for the atmosphere in mind before creating a store design since the retail environment is capable of eliciting a wide range of behaviors from consumers.

Mary Jo Bitner in her (1992) work “servicescapes” talked about Spatial layout that refers to the ways in which machinery, equipment, and furnishings are arranged, the size and shape of those items, and the spatial relationships among them. Bitner also emphasized on the fixtures as one of the key features of the retail store. (Bitner 1992)

	Elaborate	Lean
Self Service (Customer only)	Golf Land	ATM
	Surf n Splash	Ticketron
		Post Office Kiosk
		Movie Theater
		Express Mail Dropoff
Interpersonal service (Both customer and employee)	Hotels	Dry Cleaner
	Restaurants	Hotdog Stand
	Health Clinics	Hair Saloon
	Hospitals	
	Banks	
	Airlines	
	School	
Remote Service (Employee Only)	Telephone Company	Telephohne mail order desk
	Insurance Company	Automated services
	Utility	Voice message services
	Many professional Services	

Table 2: Taken from Servicescape by Mary Jo Bitner

The effect of atmospherics, or physical design and decor elements, on consumers and workers is recognized by managers and mentioned in virtually all marketing, retailing, and organizational behavior texts. Yet, particularly in marketing, there was a surprising lack of empirical research or theoretically based frameworks addressing the role of physical surroundings in consumption settings. Managers continually plan, build, change, and control an organization's physical surroundings, but frequently the impact of a specific design or design change on ultimate users of the facility is not fully understood.

The impulse to buy is hedonically complex and may stimulate emotional conflict. Also, impulse buying is prone to occur with diminished regard for its consequences (Dennis W Rook 1987). On the other hand, unplanned purchasing includes items for which the purchasing decision was made in the store and not prior to entering the store. Thus all impulse buying is unplanned but all unplanned purchases are not necessarily bought on impulse. Impulse buying can be influenced, so retailers invest in marketing instruments designed to trigger it (Mattila and Wirtz 2001).

Environmental psychologists have studied the relationship between physical environment and human behavior for several decades. Mehrabian and Russell through a series of experiments presented a valuable theoretical model to demonstrate the effects

of physical environment on human behavior. Through a Stimulus–Organism Response (S–O–R) paradigm, the model posits that external environmental stimuli (S) can generate emotional responses in an individual (O). These emotional responses further elicit the individual's approach or avoidance behavior towards the environment (R). Environmental psychologists suggest that individuals react to places with two general, and opposite, forms of behavior: approach and avoidance (Mehrabian and Russell 1974).

Burman and Evans (2003) divide the atmospheric stimuli into four categories but Turley and Milliman, based upon the findings on the literature stream, find it necessary to add the fifth category of Human variable to complete this typology. Liu, Y., & Jang, S. (Shawn). (2009) studied the same model in restaurant settings to find it apt.

Turley, L.W. and Milliman, R.E. (2000) improved Berman and Evans's (1995) model and described five categories of atmospheric variables: external variables (signs, entrances, windows and size and color of the building); internal variables (floor, colors, lighting, music, aromas, corridor widths, materials, textures, lining, goods, temperature and cleaning); layout and design variables (design of space, location of fixtures and equipment, distribution and correlation of departments and products, waiting areas and circulation flow); decoration and sales

points variables (display units, signs, wall decorations and photographs); and human variables (employee and customer characteristics, uniforms, agglomeration and privacy). (Turley & Milliman 2000) (Berman & Evans 2003)

Inclusion of human variable in retail atmospherics opens up another area for further investigation and studies were conducted on almost all aspects of human interaction in retail environment, be it crowding and its impact (Pan and Siemens 2011) or motivation and presentation of the retail associate (Dokukina & Zarudnaya 2021), responsiveness of sales force and its impact on retail sales (Naylor & Frank. 2000) Point of sale - the staff, speed and accuracy helps in increased customer satisfaction level (Ardakani & Ardakani 2015) and cleanliness and friendliness of sales staff impacts the overall customer satisfaction and retail sales (Beneke, Hobson & Mia 2012).

Technological advancements and standardization of retail systems and processes has helped in automated buying and least human interaction models are being sought after in low margin routine shopping scenarios to enhance efficiency and profitability. A recent 2023 Connected Retail Experience Study, conducted by Incisiv in collaboration with Verizon Business published in business wire in March 23, highlighted that retailers anticipate automating up to 70% of routine store tasks by 2025, aiming to reallocate staff

to more customer-centric roles and streamline operations (<https://www.businesswire.com> Jan 25). Implementing automation technologies, such as self-checkout systems and automated inventory management, has been shown to reduce unit costs by up to 20%, leading to a margin expansion of 50 to 100 basis points over time (Retail Technology Trends: AI & Automation Lead Industry Growth | Morgan Stanley Jan 25).

Luxury, big ticket, technical and/or experience driven shopping or personal styling services has more human interaction to enhance customer experience. B2B and wholesale involving a lot of negotiations and personalized contracts has to rely on human interaction. Pharmaceuticals and healthcare retail, automated high end electronics retail, gourmet and wine retail and design services are other areas of retail where despite advancement in automated and self-service technologies, personalized guidance is sought by the shoppers.

This paper focuses on ease of shopping in grocery and therefore we are not discussing those aspects any further and will continue our discussion on the other variables in Mehrabian and Russel's SOR model and will go further into the impulse buying and ease of shopping through silent cues and see how it can further improve retail store's performance, improve efficiencies and reduce costs for the retailer.

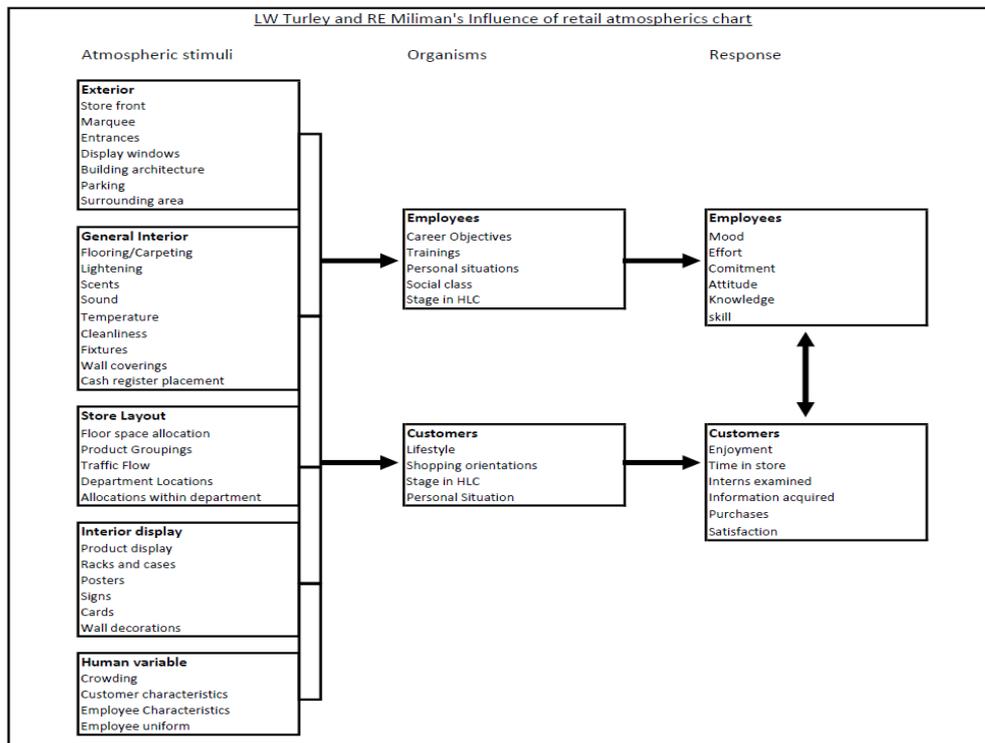


Exhibit 1: Mehrabian and Russell's (1974) S-O-R model, Taken from Atmospheric Effects on Shopping Behavior.

Silent guides – The retail store inside magic

Among the retail store materials, fixtures (shelves, tables, gondolas, counters and displays) stand out and exert a strong influence in the internal environment of the retail store, as they determine the flow of customers and exposure of products (Iyer, 1989).

There are a lot of differences in the operations of leading BnM (Brick and Mortar) retailers in India; in particular the degree of concentration, the importance of private brands, adoption of technology, quality of personnel employed, retail management styles and preferences towards profitability, growth and sustainability. Few of these may seem to be corollaries to their role and positioning but few are pushing the boundaries with the use of pricing techniques and others through the use of technology focusing the customer needs.

One Door CEO Tom Erskine and retail consultant and author Andrew Smith discuss its origins in a 'Rethink Retail' podcast. Erskine says, "Kmart invented the technology of the paper planogram. They were the first ... to figure out that if you optimally placed products in a particular place, in a store, you could sell more. And so they used this way of communicating to their associates." (www.dotactive.com - May 24)

Marshal R Godwin (1956), in his research paper on "Improved merchandising of agricultural products" at University of Florida, mentioned the need of effective merchandising techniques and talked about 'the purchase and use patterns of consumers may provide a basis for the selection of an assortment of package types or pricing units to be subjected to closer scrutiny to market tests. The impressions and opinions of the consumers may be employed to determine the methods, types and sizes of displays having the greatest potential appeal.' He also emphasized on the data being drawn from the market research on the space allocation apart from other aspects of retailing.

Early researches talked about the proximal environment that surround the customer as retail space, but they established the fact that retail store is

a group of cues, messages and suggestions that communicate to buyer. Retail store designers, planners and merchandisers shape space and that space in turn affects and shapes customer behavior. (Ebster 2011)

With rising cost of workforce and shrinking retail space, the need of automated retailing where the store itself, silently guides the customers to walk, follow, pick, check and bill with least human intervention, was pushed with the help of technology and smart planning. Technologies such as AI-powered vision systems, RFID, IoT sensors, and mobile-based checkout solutions enable stores to provide a seamless, low-intervention shopping experience. (Robot packers and AI cameras: UK retail embraces automation to cut staff costs | Retail industry | The Guardian Jan 25)

Grocery stores selling 90% of low margin FMCG categories in their assortment have always been pushing for improving margins by reducing operating expenses. Store's overall profitability depended on training the customers to navigate in these self service stores and human interaction was reduced to only maintaining the shelves, environment, cash and managing exceptions.

Dennis W Rook (1987) while working on 'The Buying Impulse' has quoted Patterson and Cox as "Impulse buying research proliferated and extended to investigations of how merchandising stimuli such as retail shelf location (Patterson 1963) and amount of shelf space (Cox 1964) affected impulse buying." Cox (1964) concluded that the shelf space influences sale of staple items but not the impulse goods. Kotzan and Evanson in (1969) identified the optimal number of shelf facings for four drugstore products and identified a significant relationship between the number of shelf facings and sales. David T. Kollat and Ronald P. Willett while studying Customer Impulse Purchasing Behavior in 1967 established that In-store stimuli apparently create new needs or remind the shopper of temporarily forgotten needs.

Cox (1970) repeated his 1969 experiment and observed a significant relationship between shelf space and impulse products. Increasing shelf space for staple brands is not as effective. Adding additional shelf rows in high volume stores is generally more effective than changing shelf. (Frank and Massey 1970)

Curhan (1972) experimented on actual shoppers in a field experiment with Shelf space as a variable for Unit sales tested a model that hypothesized that several variables mediated the shelf space–unit sales relationship. Although shelf facing changes only explained 1% of variance, it does have significantly more impact on private brands than it does on national brands.

Curhan repeated the experiment in 1974 again on actual shoppers but used Fractional factorial design taking display space, Price advertising and Display location as independent variables and tested the effects of the independent variables on four different product categories. He concluded that the display space was the only variable significant for all four products.

Patton in 1981, worked on 175 female homemakers and used a 2X3 factorial design in a lab experiment using product quality and display type as independent variable and brand choice as dependent variable and concluded that when faced with equal quality, the majority chose brands with the most available information. When quality is unequal, the effects of information decrease. However, “market share” was higher for all products that had more extensive information.

Gagnon and Osterhaus in year 1985 while studying floor display and type of SWAS (Store within a store) location and its impact on sales. Collected sales data from 24 pharmacies and 24 grocery stores on the effects of pop displays. Gagnon et. al. established that pop displays increased sales of ointment by 388% in grocery stores and 107% in pharmacies.

Park, Iyer, and Smith (1989) used Store layout knowledge and Time pressure as independent variable to study its impact on Unplanned purchases, Brand switching and Brand switching concluded that Both store knowledge and time available for shopping influenced unplanned brand switching and purchase volume. Consumers who shop in the condition of low store knowledge and the time pressure switch brands due to inability to find their preferred brand.

In-store advertising/promotion and the competition on obtaining shelf space has become so intense that food/beverage manufacturers are paying slotting or display fees to retailers. In some rare instances, there

have been cases where retailers receive payment for an initial slotting, as well as fees to maintain the shelf space and fees if a product is a failure. (Webber, Sausen, Basso and Laimer 2018) The retail store brings the advertisement, products, consumer and money together in the same place and at the same time

(https://www.ipsos.com/sites/default/files/ct/publication/documents/2022-06/Convergent-commerce-ecosystems.pdf?utm_source=chatgpt.com - Aug 24).

Strategic remodeling improved the performance of the stores surveyed, demonstrating the importance of retail store management as a strategic resource that can improve performance and competitiveness. (Webber et. al. 2018) Applying the balanced scorecard (BSC) perspectives, the retail store strategies had a greater influence on the dimension of internal processes than on other dimensions. Specifically, lighting is the redesign strategy that provides the best performance result. (Burke & Payton 2006)

We are working on these aspects in Indian context and diving deeper by using industry specific terminologies for all of these. For example, internal layout is termed as floor-plan, the way products are displayed in store is termed as modular or planogram, location of products within department is also termed as category flow, product groupings is termed as category adjacencies and we will go further deep into the way specific gondola or section or fixture is filled with merchandise and the broad guidelines used in filling these.

While studying retail shop-ability, Priyanka Singh, Neha Katiyar and Gaurav Verma (2014) studied seven factors each having Eigen Values exceeding one for Customer Buying pattern and analyzed them on Principal Component Analysis using Varimax and Kaiser normalization concluded that retail atmospherics is most important this includes window display, equipment and fixtures. Store layout and design emerged as second most important factor this includes planogram.

Dr. Raymond R. Burke and Paula E. Payton (Issue 50 | Viewpoint) talking at length with numerous examples, the 10 principals of retail shop-ability and this article talks about fixtures, aisles, category presentation and ease of shopping through better floor-plan.

This article talked about these 10 principals of retail shop-ability:

1. Show the product
2. Provide effective navigational aids
3. Simplify product organization and presentation
4. Minimize clutter
5. Maximize product affordance
6. Showcase new items and new ideas
7. Make the shopping experience convenient
8. Make the shopping experience enjoyable
9. Speak with authority
10. Maintain flexibility

According to them a retailer helps the customer finds the desired 'destination' products the shopper will finish shopping his list and can spend the remaining time in browsing other complementary products and picks up impulse, this way sales and customer satisfaction gets enhances.

eMarketer, an internet based forecasting and analysis firm (www.emarketer.com) in its May 2020 volume presented a study by Andrew Lipsman, 'The Future of Retail 2020' 10 Trends Shaping Retail—And How They Will Accelerate in a Post-Coronavirus Economy and concluded the report in three points viz

No. 1: The future of retail hasn't fundamentally changed due to the coronavirus pandemic—but it has accelerated many pre-existing trends.

No. 2: Commerce will need to become increasingly frictionless from the standpoint of speed, flexibility and touch.

No. 3: Brands remain essential to commerce, and the winners will communicate trust, value and meet the moment.

The retailers need to focus on three control gates of shopper behavior: entry, browsing and exit. Attention should be paid to the cognitive computing solution to judge the influence of retail atmospherics on store performance and behavior of personalized shoppers. Retail atmospherics create the right experience for individual shoppers and forceful use of it has an adverse impact (Rajat Kumar Behera et al - 2023).

Chandon et al (2009) in their research found that in-store marketing works particularly well for younger, more educated, and "opportunistic" consumers, not because of differences in attention (attention patterns and the influence of in-store marketing were similar across all consumers) but rather because these

consumers were more willing to consider and choose brands that were brought to their attention as a result of in-store marketing (i.e., less stickiness).

Astute retail space allocation is able to convert patronage into sales. (Buttle, F. 1984) Retailers challenges are — how to generate store traffic and how to increase sales per customer. In static market like food and groceries, the demand is more or less constant, the only way to increase that is to bring in more footfall at the expense of the competition. Once a customer enters a store he can be exposed to the atmospherics and merchandising techniques.

Product proliferation has not only increased the complexity of manufacturing and distribution, it has also intensified competition for shelf space. For instance, in the consumer-goods industry, a typical supermarket has space for only 40% of the products available on the market (Food Marketing Institute 2002). Competition for shelf space has been so fierce that some have referred to retailers' shelf space as "the most expensive real estate of the world" (Kaikati and Kaikati 2006). An immediate consequence of the scarcity of shelf space, there has been a shift in power in retail chains, from the consumer-goods manufacturers to large retailers (Thomas and Wilkinson 2014).

Category Development Planning

Category management concept was first introduced in the USA as an industrial project and ever since category management remains a hot topic of local and international conferences with many books and reports published. (AC Nielsen) A fundamental change took place in the retail grocery and drug store industries as retailers and manufacturers begin to embrace a process called category management (CM). Traditionally, retailers assigned buyers to purchase brands of specific manufacturers, instead of making all purchases within a particular product category. Individual brand-oriented buyers sought to improve their economic performance by procuring large quantities of product on deals and then relying on retail pricing, promotions, and merchandising activities to deplete brand-level inventories as quickly as possible.

In contrast, CM recognizes the interrelatedness of products in the category and focuses on improving the performance of whole product categories rather

than the performance of individual brands. Under CM, traditional brand (vendor)-oriented buyers are replaced with category managers who are responsible for integrating procurement, pricing, and merchandising of all brands in a category and jointly developing and implementing category-based plans with manufacturers to enhance the outcomes of both parties (Progressive Grocer 1995a, b; Supermarket News 1997)

“Category Management is defined as A joint retailer – supplier process– of managing categories as strategic business units– and producing enhanced business results– by focusing on delivering consumer value” (“CatMan 2.0™: The Essential Guide to Modern Category Management,”)

Retailer interest in CM is high. For example, according to one recent industry report, 83% of grocery retailers surveyed view CM as the most important issue facing them (Progressive Grocer 1996), and another study shows CM initiatives to be the most important reason that retailers are improving their information technology systems (National Association of Chain Drug Stores Review 1997).

Category Captainship (CATMAN):

A collaborative approach where a leading manufacturer manages a product category on behalf of a retailer. (Kurtulus M, Toktay BL. 2011) The retailer appoints a category captain by interviewing the leading manufacturers from the category, the selected manufacturer hires a trained resource to be placed at retailers HO and work closely with the retailers category development and planning teams. The manufacturer provides insights, resources, and recommendations, potentially leading to better category performance. (K.M. Ilyenkova 2022)

Advantages: Includes cost savings, access to expert knowledge, and improved relationships between retailers and suppliers.

Disadvantages: Risks of opportunistic behavior by the category captain, potential conflicts with other suppliers, and reduced control for retailers.

In India the JV of Bharti and Walmart started this project in 2011 and were successfully developing the categories of confectionery with Mondelez and Juices with Pepsico in the pilot run. The category captain was responsible for complete planning, assortment, inventory, display, visual merchandising and data being collected from the category trends were jointly analyzed by retailers and category captains to increase the profitability and growth. The

results has shown significance improvement in overall category performance especially in the supply chain elements like improved vendor fill rate, better lead time, pack size optimization and GMROI and GMROF witnessed improvement with this joint effort..

GMROI (Gross Margin Return on Investment) is a retail and inventory management metric that measures a company's ability to generate gross profit from its inventory investment. It is commonly used in retail, wholesale, and supply chain management to assess inventory efficiency. The Gross Margin Return on Investment (GMROI) formula was not attributed to a single individual but rather evolved as a financial and inventory management metric used in retail analytics and merchandising. (Michael Levy & Barton Weitz – 1996)

The concept of GMROI emerged in the mid-20th century as retailers sought better ways to measure inventory profitability beyond just turnover rates. Early retail financial analysts and consultants developed it as part of merchandising financial management. The metric gained prominence through publications in retail operations research and inventory management textbooks. (Barry Berman & Joel Evans – 1983)

Huge push from the manufacturers to win shelf space in modern retail lead the retailers and researches to come up with a more advance tool to measure profitability in terms of sales by SKU or vendor by space per square foot given to particular SKU or vendor. . (Michael Levy & Barton Weitz – 1996)

Gross Margin Return on Footage (GMROF) is a retail performance metric that measures how efficiently a store or department generates gross profit per square foot of selling space. It is particularly useful for retailers with physical stores, helping them assess the profitability of their floor space allocation.

GMROF Helps retailers optimize store layout and merchandising. Also it helps in Identifying underperforming areas of the store and is useful for making space allocation decisions (e.g., increasing space for high-GMROF products). GMROF also helps compare different departments or product categories. Large Retail Chains (1990s-Present): Companies like Walmart, Target, and Macy’s have used GMROF alongside GMROI to determine the best use of store space. They also use GMROF to evaluate store layouts, category performance, and store expansions.

The concept of measuring profitability per square foot was popularized in the 1980s and 1990s, as large retailers began focusing on space productivity metrics to optimize store layouts. GMROF became particularly relevant in grocery retail, department stores, and big-box retailers, where physical space allocation directly impacts sales performance. (Barry Berman & Joel Evans – 1983)

Category adjacencies and Customer Decision Tree

We understand Routing of the customers to reach every corner of the store as a silent guided tour is achieved through store layout planning and placing most suitable product categories adjacent to each other creating an obvious flow by using smart category adjacency techniques.

For example, while drafting the floorplan for a store, retail space planners

1. Working on 'breakfast cereal category', should put 'biscuits' after it or 'jams and spreads' or 'tea and coffee', it is highly unlikely that he puts breakfast cereals adjacent to regular cereals and pulses.
2. Working on 'Baby needs and diapers' will it make more sense along-with 'skincare category' or 'mens grooming category' or 'feminine hygiene category' and never with detergents and soaps?

Allocating products on shelves under merchandising rules: multi-level product families with display directions Retailers' individual products are categorized as part of product families. Merchandising rules specify how the products should be arranged on the shelves using product families, creating more structured displays capable of increasing the viewers' attention. (Teresa Bianchi-Aguiar et. al. 2017)

When it comes to shelf study, there are lots of studies about the optimum assortment and volume in terms of facings of the products, but we have scope to study how the customer wants to see the products placed on the shelf. We came across over a dozen variables to study for individual product category to find out how to place the SKUs on display, these variables are:

- Size
- Color
- Variant
- Benefit

- Quality
- Brand
- Customer Segment
- Taste
- Ingredient
- Offer (Club)
- Customer Needs
- Discounts and Schemes
- Seasonality
- Price Tiers
- Shelf Placement (Eye-Level Marketing)
- Product Lifecycle
- Usage Occasions
- Nutritional or Health Attributes
- Sustainability or Ethical Factors
- Consumption Patterns (Frequency)

Few retail practitioners call it customer decision tree, and tries to place the products as per its category decision tree.

For example:

1. Cooking oil category is normally displayed by product type (Olive, Vanaspati, Soya, Mustard, Til, Groundnut, Sunflower, Rice bran etc) then its placed either by price blocks or brand blocks with pack size increasing towards the bottom shelf.
2. Carbonated soft drinks (CSD) is primarily displayed by brand (Coke, Pepsi and Campa blocks) then by colour/flavor (Cola, Orange, Clear, Mango etc) and then size
3. Hair care category is displayed by Benefits (pre wash, wash and post wash) like oils, shampoos, conditioners, creams and gels etc. then by brand blocks within each benefits.
4. Namkeens are placed by flavor blocks whereas coffee by brand blocks.
5. Biscuits are sold by occasion (pack size) and taste (Sweet/salty/choco) and benefits then by brand and price

Since the same customers within the same category can make different decisions in different situations (weekend shopping vs. quick shopping for breakfast), in different life roles (shopping alone or with children) and that decision trees change over time. For this reason, instead of using a universal logic the practitioners address the problem on a case-by-case basis.

The need is to do some empirical research and find out what is the best way to place a category and a product within the category.

II. CONCLUSION

Like any other industry, sales in retail too does not come off easily mainly due to fierce competition, new entrants, localized competition at all locations, and a large number of choices made available to retail customers from deep rooted unorganized players are among other reasons to mention a few. Ever since the retailers are trying to make the shopping easier, products displayed well, shopper interact with the product, ask fewest questions and complete the purchase. Retailers find it ever more difficult to create a lasting impression and generate loyalty and that can happen even with best prices, offers, discounts, ease of shopping experience and fresh assortments.

Therefore, the need for a scientific design of retail store in order to attract and retain customers is hugely felt by all retail players across different retail categories be it lifestyle goods retail, electronic goods retail, or even food & groceries retail. Furthermore, while the areas of concern and managerial solutions to handling front-end and back-end problems across all retail segments could be generic but the problems faced by the organized grocery retail are indeed unique, automated purchases improves margins for low margin grocery retail.

Category Adjacencies and Customer decision tree is important for setting up the retail store design, customer movement (Route) and displaying the shelf merchandise in most suitable manner for ease of shopping and impulse buying.

There is a scope to conduct further academic research in India to find the most preferred category adjacencies within a grocery store.

and

Some efforts can be put in developing Customer Decision Tree (CDT) for all retail categories to bring in uniformity and improve efficiencies for the sector as a whole because without clear guidelines the smaller retailers in tier II and III towns are struggling to setup their store and are being manipulated by the manufacturers who win the lion's share on shelf in the world's costliest real estate, the retail store.

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