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An Empirical Analysis of Online-Offline Price Differences and Supply Chain Optimization Strategies

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Abstract: ***Rapid expansion of the e-commerce sector has brought forward great transformation in the retail industry which in turn has brought out visible differences in the prices set by online as against physical stores. In this study we look at price changes which we also look at the role that improved supply chain performance play in reducing those price differences. We use primary and secondary sources to look at price trends, consumer behavior, and efficiency. We find that online stores generally present lower prices for products which they do so because of lower operating costs and better pricing strategies, also physical stores' edge is in immediate product delivery and personalized customer service.***
Keywords—Online Retail, Traditional Retail, Price Variations, E-commerce, Supply Chain Operations,

I. INTRODUCTION

Rainfall Over the past ten years, the retail industry has changed a lot, mostly because of fast changes in technology, more people using the internet, and more people using smartphones. E-commerce platforms have changed the way people used to shop by letting them buy a wide range of goods and services from the comfort of their own homes. This transformation has resulted in the combination of online as well as offline retail stores, which makes the corporate world highly competitive and very fast-moving.One of the key impacts of this shift is that product prices are increasingly diverging between online and physical retail outlets. Consumers purchasing goods frequently observe that identical products are priced differently across various websites. Online retailers typically offer lower prices on their products due to several inherent structural benefits. Here are some of the advantages: reduced expenses for operating the company and developing infrastructure, centralized storage facilities, decreased dependence on brick-and -mortar outlets, and the application of data-informed dynamic pricing approaches.

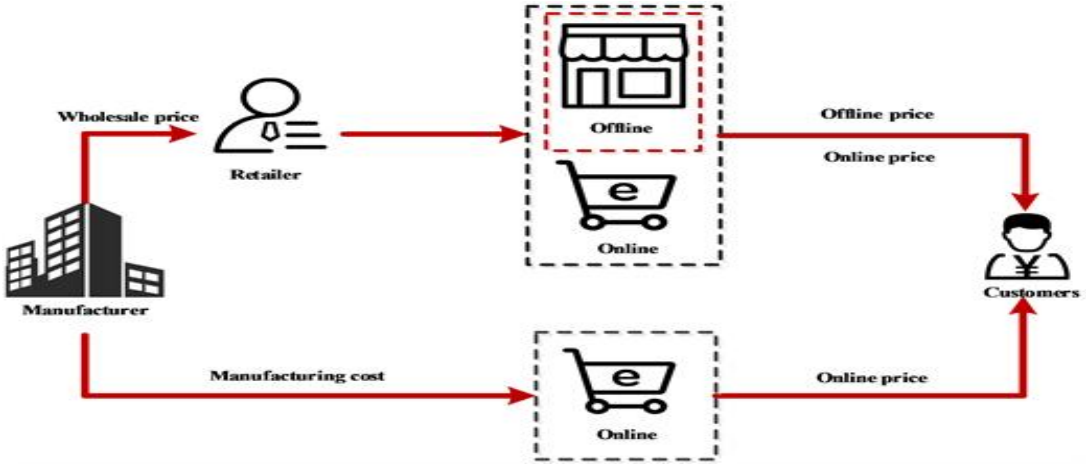


Fig. 1. Online–Offline Retail Pricing and Supply Chain Flow Model

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Here are some of the advantages: reduced expenses for operating the company and developing infrastructure, centralized storage facilities, decreased dependence on brick-and -mortar outlets, and the application of data-informed dynamic pricing approaches. The economy is, in general, a good place to be for e-commerce; efficient scale & lots of competition allow further price savings. Companies looking for sustainable growth must therefore comprehend the relationship between online and offline pricing variations and their effect on supply chain optimization versus customer satisfaction and brand loyalty when such variance occurs.There has been quite a bit of research conducted around channels (online and offline) as they relate to supply chain optimization with the conclusion being that if there are extensive pricing variations among the two channels, then it may create customer dissatisfaction, develop channel conflict, and reduce brand loyalty within each of these channels. That is why companies should develop integrated pricing strategies and develop efficient supply chain processes to support them throughout all Channels/Channels.

II. RESEARCH OBJECTIVES

The research is into 5 primary areas.

1) To look at the difference between what is charged by retail stores and web shops.
2) To see what causes make prices to go up or down.
3) To study how supply chains play a role in pricing.

III. LITERATURE REVIEW

The development of e-commerce on a large scale has brought about changes in the retailing industry on an international level. There has been considerable research undertaken within the academic field as far as the differences between pricing strategies, consumer purchasing behavior, and the significance of supply chain management in increasing efficiency are concerned. According to the analysis carried out, the major factors involved in distinguishing online from brick and mortar retailing include pricing strategies, costs of operation, logistics efficiency, and technological adaptation. Moreover, in the initial days when e-commerce had just started gaining popularity, researchers claimed that electronic marketplaces eliminate information gaps thereby making prices more visible. For instance, according to Bailey in his study of electronic commerce conducted in 1998, he claimed that the electronic marketplace offered highly competitive conditions where consumers were able to compare prices offered by various vendors.

Ancarani and Shankar (2004) looked at price difference between various retail channels and reported that prices do in fact vary which they attributed to brand image, competition, and how the products are perceived. Also according to their study which products may be the same may sell for different prices in different retail settings which in turn are targeted at different consumer groups and which also may present different sets of services. Also Pan, Ratchford and Shankar (2002) looked at price dispersion in the online market and reported that price variation is a reality in what is supposed to be an information free zone which is the internet. Also they found out that issues like shipping costs, seller rating, promotions, and consumer trust are very much a part of the online purchase decision. Which means that in the on line environment also consumers do not base their purchase decisions only on price.

Similarly it was reported by KPMG in 2020 that consumers in India are tilting towards what we may call a mix of shopping models which see them research products online which they then buy either on the digital platform or in the brick and mortar store. Also they noted that which companies do well in this environment are those that put in place logistcis infrastructure and customer analytics solutions. In a separate report from 2022 McKinsey Company reported that artificial intelligence, automation, and data analytics are at the forefront of transformation in supply chain management and retail pricing. What we see is that companies which use real time inventory tracking and dynamic pricing are better able to react to market demand and change in what consumers want.

Across all studies we see that which retail channel prices differ between online and offline is very much a function of operational structure, logistcis efficiency and technology adoption. Online players do better in terms of cost efficiency and digital tools, offline stores in terms of customer engagement and service quality. Also it is put forth in the literature that which supply chains perform best are the ones which are able to reduce costs, minimize price variation and improve their chance at sustainable growth.

IV. RESEARCH GAP

There are some research papers available on online pricing, consumer behavior, and supply chain efficiencies, but it can be argued that there remains a gap in literature where all these aspects are discussed together in the Indian retail market scenario. There seems to be an observation that literature is mostly theoretical and concentrated on business models for developed countries.

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Additionally, there is also a need for empirical evidence on the effects of supply chain improvement on retail pricing and consumer satisfaction. Hence, the present research paper attempts to find the connections between the online price discrepancy and supply chain improvement in the Indian retail industry context.

V. RESEARCH METHODOLOGY

To that which the study sets out to achieve largely research methodology is a system of collecting, analyzing and interpreting data. We looked at price variation of products between online and offline purchase channels and how supply chain optimization plays a role in product price which is studied via a systems approach. The research approach is both description and analysis the descriptive element of the framework we used identified and reports on how the prices of the same products play out between online and offline retailers. Descriptive elements of the study report on what is happening in present market terms -- which products are seeing price increases or decreases and how people react to those price changes. In this study we look at how price changes play out in terms of supply chain performance which includes logistiscs, inventory management and demand prediction. We took an empirical approach which included primary and secondary data collection. For the primary data we used structured questionnaires and surveys which we presented to consumers that had experience with online and also offline purchases. The surveys included questions on price comparison, purchase trends, ease of use in the purchase process which also covered issues of customer satisfaction. This data will help us to better understand consumer perspectives and behaviors. In our study we used secondary data from reliable sources like research journals, scholarly books, industry standards reports and web based materials which provided theoretical support to our study, context related to the research and also insight into pricing strategies and supply chain operations.

In this study we used a non random sample which we obtained from those that were available and willing to take part. We looked at close to 100 individuals which included students, professionals, and regular consumers. This gave us diversity in the results and a better perspective. We used many methods in data analysis which included percent analysis, comparative analysis and tabulation. Also we used graphs and charts to present the data in a very clear and easy to understand way. These tools helped us to identify trends and relationships between variables. Our study is of a cross sectional design which means we collected data at a given time to evaluate present market conditions. We maintained ethics by securing that people's participation was voluntary and that their data was confidential.

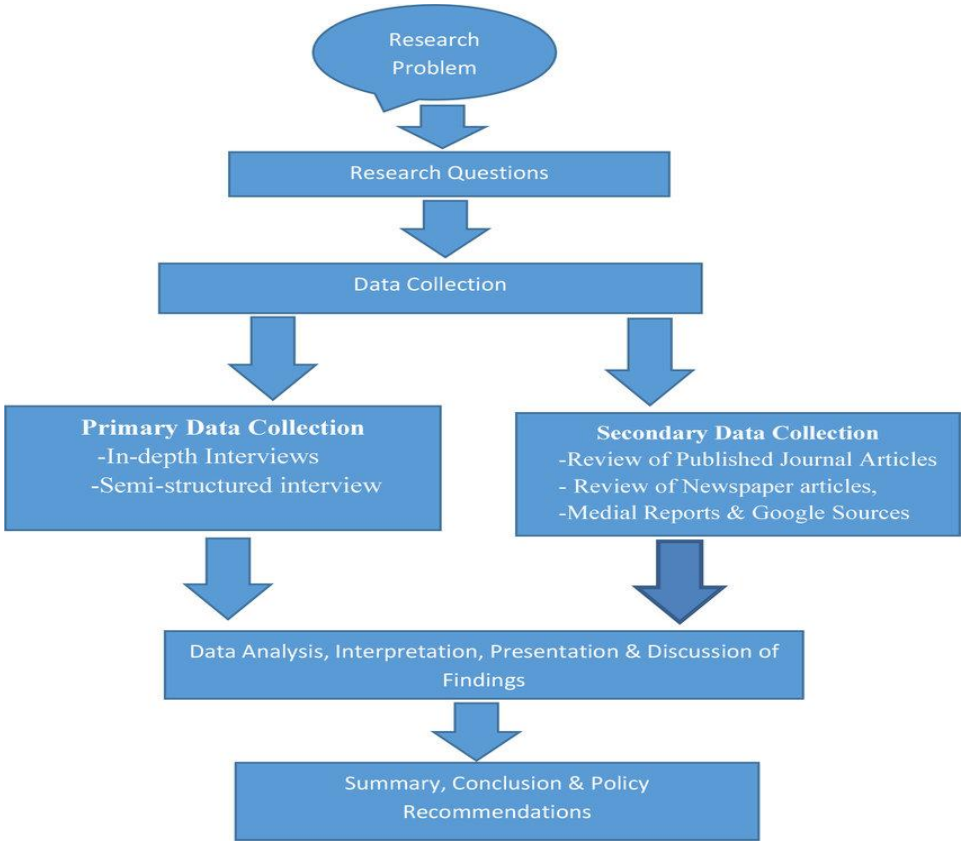


Fig. 2. Methodology

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VI. RESULT AND CONCLUSION:

Chart 1: Online vs Offline Price Comparison

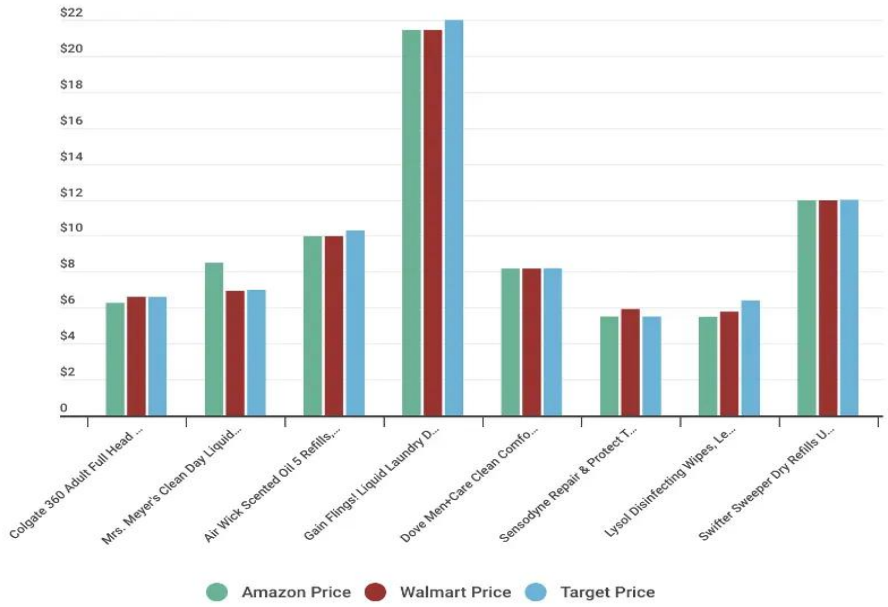


Fig. 3. Online vs Offline Price Comparison

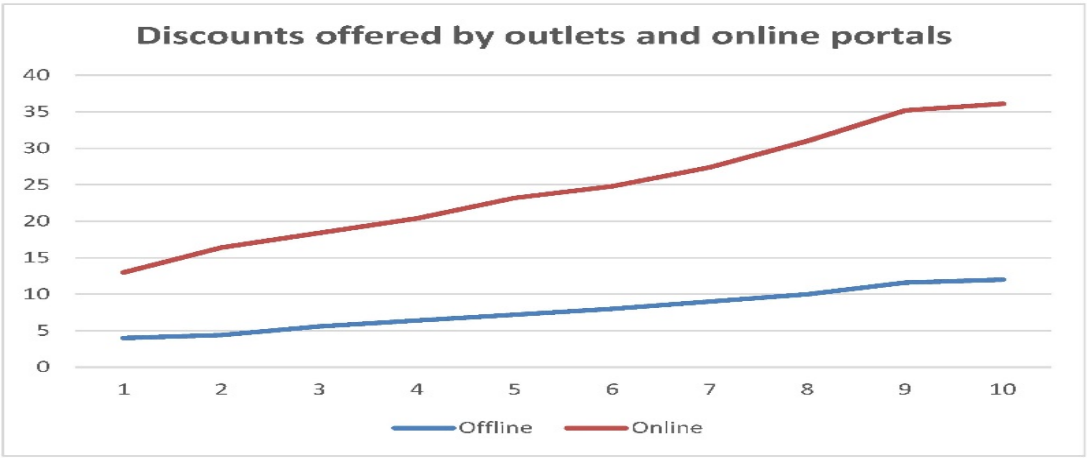


Fig. 4. Discount Offer by Online vs Offline Price Comparison

Category	Online Price (₹)	Offline Price (₹)
Electronics	18,000	20,500
Clothing	1,200	1,500
Groceries	900	950

Interpretation:
Prices tend to be relatively low because of the lower overhead expenses involved.

Chart 2: Factors Influencing Consumer Purchase Decision

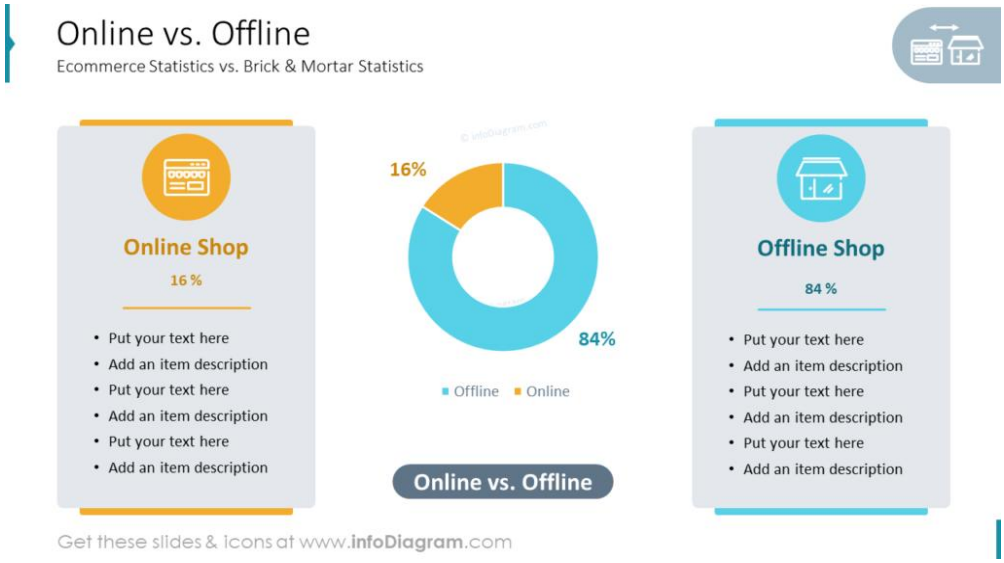


Fig. 5. Factors Influencing Consumer Purchase Decision

Interpretation

Price is the first priority, while convenience and availability come next.

Chart 3: Supply Chain Impact on Pricing

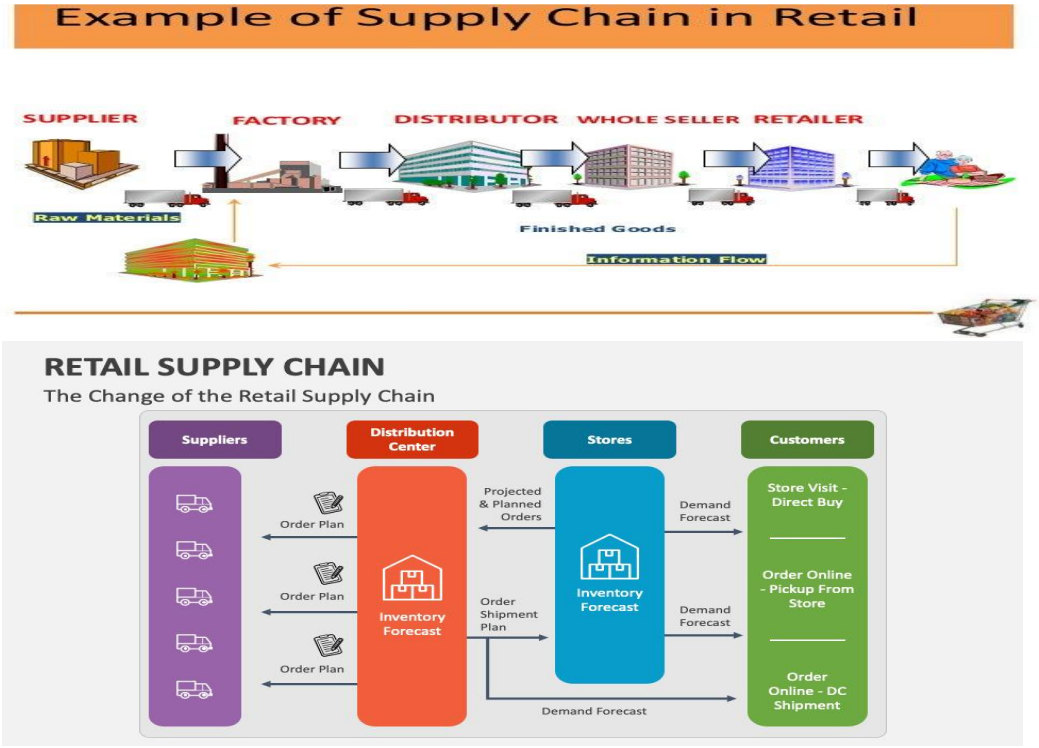


Fig. 6. Supply Chain Impact on Pricing

Factor	Impact Level
Logistics Efficiency	High
Inventory Management	High
Demand Forecasting	Medium

Factor	Impact Level
Technology Adoption	High

Interpretation:
Effective supply chain management is responsible for keeping prices low and minimizing price variations.

VII. DISCUSSION OF FINDINGS

1) Online portals charge cheaper rates because they have lower operating costs.
2) The costs at physical locations are higher; therefore, their prices are higher too.
3) Customers leverage various means (omnichannel marketing)
4) Supply chain management plays an important role in price setting.
5) Technology is vital in cutting down cost and formulating pricing strategies.

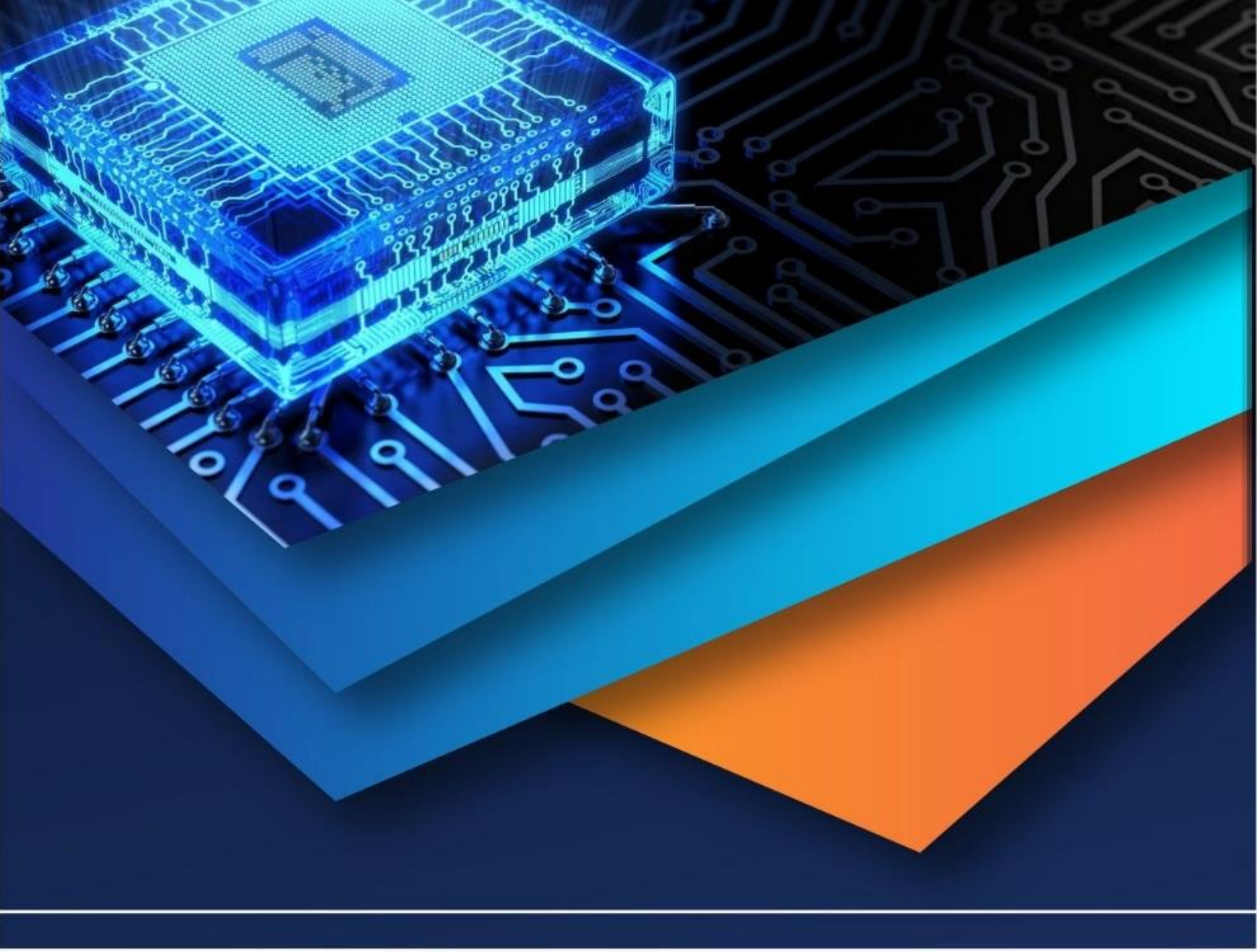
The results indicate that the pricing difference is influenced not only by the costs but also by customer behavior. Dynamic pricing and efficient logistics help online businesses maintain competition through better services and constant availability for offline companies. Inefficiency in the supply chain causes higher costs especially in case of offline stores. It is crucial for businesses to coordinate operations and use modern technologies to reduce the gap.

VIII. CONCLUSION

The report puts forth the main results of the study which also weaves in how they tie back to the study's objectives. We see that the report notes out large scale price differences between online and physical sales, the primary cause of which is the distinct cost structures, efficiency, and logistic support systems. We find that the online channel has taken off with the low overhead costs, large warehouse networks and use of state of the art tools like dynamic pricing. At the same hand physical retailers have reported to have greater lease, labor and inventory costs that which which play out in the high prices of their products. That said physical stores do have the edge on which products are immediately available, better customer experience and in terms of brand credibility. Another key issue is that we see supply chain efficiency as very important in terms of price stability. We see that good supply chain management and stock as well as sales forecasting which in turn allows companies to reduce costs and put themselves in a better pricing position. Also in summary it is reported in this research that for companies to do away with price variations and at the same time achieve customer satisfaction they should adopt integrated solutions which improve the performance of their supply chains

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