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## Impact of COVID-19 on the Indian retail industry: meta-trend analysis based on text mining

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**Abstract:** COVID-19 has induced a huge economic crisis and adversely impacted the retail industry. The study critically evaluates the impact of COVID-19 on the Indian retail industry, its transition as a result of the pandemic and challenges faced by it. The study shares measures and avenues that retailers should focus on to be on par with the changes in consumer behaviour that have resulted from the pandemic. This was done through a qualitative analysis, i.e., by the text mining technique in R. The qualitative data analysis and use of analytical models like word cloud, topic modelling, latent semantic analysis (LSA) have highlighted the major impact of COVID-19 on the Indian retail sector as: changes in consumer behaviour and shopping pattern, supply-chain disruption, demand fluctuation, digital transformation of the sector and liquidity crunch faced by physical store-based retailers. The study provides a direction in theoretical, empirical and applied research to retailers, researchers and policymakers.

**Keywords:** COVID-19; retail industry; text mining; topic modelling; latent semantic analysis.

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**Biographical notes:** Pooja Misra is an Associate Professor in Economics has a work experience of 25 years+ in academics and the corporate industry. She is currently the Chairperson, Economics, Birla Institute of Management Technology, Greater Noida. She opted for the Academic world in 2008 and has completed her PhD in Management from Gautam Buddha University. Her research interests include macroeconomic dimensions of an economy, compensation and current trends in the retail and business environment. She has co-authored a book titled *Resurgent India: The Economics of Atmanirbhar*

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## 1 Introduction

COVID-19 has been a crisis for the world like no other. The disease, caused by virus SARS-CoV-2 first erupted in Wuhan city of China in December, 2019. By Q1, 2020, it engulfed the whole world and was termed as a 'pandemic' by the World Health Organisation. As per WHO, more than 150 million people had already been affected by the virus and approximately 3.5 million deaths related to coronavirus had been reported across the globe. In order to flatten the curve and mitigate the impact of the virus, Governments world-wide were forced to announce lockdowns and other social distancing measures thereby bringing economic activity to a standstill. This led to millions of citizens being confined to their homes, factories being shut-down and the global economy coming to a grinding halt.

As per IMF's annual report of year 2020, the global economy was set to suffer a loss of \$2.8 trillion and contract by 3.5% in the FY2020-21, a direct impact of the pandemic. G7 countries, India and China were amongst the most adversely affected nations. As China and G7 nations were the hub of supply and production, therefore, halt in their business activities gave shocks to globally dispersed and interconnected supply-chains. Consumer spending had taken a hit. In the world's largest consumer market, The USA, personal savings rates went to a record high of 32.7% in month of April 2020 which was indicative of the fact that consumer sentiments had gone through significant shifts in terms of choices, preferences and spending habits.

All these external environmental factors brought in major challenges for the retail industry world over. COVID-19 had left both essential and non-essential retailers perturbed. Apart from facing a financial crunch due to shut down of stores, retailers had to quickly adapt to the new normal in order to survive the competition. Transitions that would have taken decades were now happening within a span of few weeks. The journey to recovery was arduous and challenging.

With the pandemic having adversely impacted countries worldwide both economically and in terms of healthcare Governments and nations had been forced to come up with conventional and unconventional measures to revive the economy. To contain the spread of the virus, the Indian Government had announced a nationwide lockdown from March 25th, 2020 until June 8, 2020. Except for some essential services, businesses, manufacturing units and other non-essential services were forced into an unprecedented shutdown or were required to conduct business under a work from home

model. To add to the misery, many a nation had been wrestling under the onslaught of a second wave of the virus which had again resulted in a major health-care, social and economic impact on the lives of millions of Indians.

India's unemployment rate skyrocketed from 8% in March to 23.7% in April, 2020. As per the Economic Survey 2021, the Gross Domestic Product of India contracted by 7.5% in the FY 20-21 which had been further revised to (-)7.3%. However, with the second wave of the virus and an anticipated probably third wave the road to recovery was still quite some distance away. On the flipside, the rise of ecommerce, online education and insurance business had been the silver lining on the wall.

Amongst the worst hit sectors, retail, aviation, automobile, hotel and travel had borne the brunt of the pandemic. Movement restrictions caused deep supply-chain shocks that had a cascading effect on manufacturing and businesses of many industries. Salary cuts and health concerns had significantly affected consumer demand. Fitch solutions had forecasted that consumer spending had contracted by 12.6% in 2020 (PTI, 2020a). In India, Confederation of all India Retailers reported a loss of INR 15.5 trillion rupees within a span of 100 days during the lockdown as the pandemic had brought upon behavioural shifts in consumer behaviour which was here to stay. Some of these permanent impacts were most prominent in the retail industry.

### *1.1 Impact on Indian retail industry*

The retail industry constitutes nearly 10% of India's GDP and has reached a worth of US \$950 billion in 2018 with a CAGR of 13% (India Brand Equity Foundation, 2020). With the Indian economic scenario rapidly changing, the retail industry is fast paced and dynamic in nature. E-commerce and brick n mortar retail are the two major segments of Indian retail. India brand equity foundation forecasted in 2018 that food and grocery segment will account for 66.3% of total sales revenue of retail sector by 2020 followed by apparel sector accounting for 8.7% of the total retail revenues (IBEF, 2018).

The months amidst the pandemic, had been intense for Indian retailers. Retailers of non-essential goods (fashion and apparel, furniture, jewellery, etc.) were the hardest hit. During the period of nation-wide lockdown, 95% of non-food retail outlets remained closed. (Retail Association of India, 2020). Confederation of All India Retailers (CAIT) (PTI, 2020b) reported that the Indian retail sector suffered a loss of 15.5 trillion rupees within a span of 100 days during the lockdown. Even when stores opened, retailers saw a precarious drop in footfall rates. As fear of the deadly virus started decreasing amongst the consumers, numbers had started to improve in the latter part of 2020. Retailers' Association of India had reported that retail outlets were able to achieve 95% of their sales in February, 2021 compared to the previous year. But, as the country was again struck by the second wave of the deadly virus, retailers were again hard hit.

However, sectors like FMCG were known to have experienced a more nuanced impact whereby the gains would largely be in the segment of essential commodities and losses in segments such as beauty products. E-commerce saw a sharp rise during the pandemic and many consumers who were not habitual of purchasing goods online had resorted to e-commerce to fulfil their requirements. Even FMCG goods which were earlier bought from physical retail stores were now ordered online by the consumers.

Indian retail went through its toughest phase filled with challenges, transitions and unconventional incidents. While cash inflow in form of revenue and sales had taken a drastic dip, fixed expenses remained the same for physical stores, adding to the woes of

retailers. Movement restrictions led to supply-chain constraints and many retailers, particularly FMCG, were not able to manage adequate inventory levels and fulfil the demands of consumers. As unemployment levels skyrocketed, firms resorted to salary cuts resulting in a decline in consumer spending. Similarly, consumer confidence also took a hit. The initial months of lockdown witnessed panic buying of essential goods amongst the consumers. Hygiene and health beneficial products had replaced apparels as essential commodity. Footfall to physical store was negligible owing to consumers indulging in self-quarantine due to fear of catching the virus. Pandemic had given a big push to digital retail.

The challenge of quickly transitioning to this new world of retailing lay ahead. Traditional retailers had to get accustomed to omni-channel retailing, particularly digital channels and payments. Carrying on with physical store operations while ensuring safety of employees and customers was a difficult but necessary task. Retailers would now see a world where physical retailing with minimal physical contact with the consumers was the new normal. Keeping in mind the adverse impact of the pandemic on the retail industry, the authors decided to investigate the impact of COVID 19 and challenges faced by the Indian Retail industry primarily in 2020 due to the onslaught of the coronavirus.

## **2 Literature review**

In the research manuscript authored by Sayyida et al. (2021), authors have discussed the consequences of the pandemic on consumer behaviour. They have suggested that adapting to digital channels will help physical retailers to get adjusted to new consumer demands. Bhatt and Khokhar (2020), in their study investigated online convenience and its importance in driving customer satisfaction. Eger et al. (2020) state that consumer behaviour changed as a result of pandemic induced fear and containment measures taken by the governments the world over. The fear of getting ill had steered consumers into changing preferences for buying commodities.

Kim (2020) has explained the rise in digital sales globally during the pandemic-induced lockdown. Rise in e-commerce business during pandemic was a direct result of a shift in consumer behaviour patterns. Movement restrictions and health concerns have motivated consumer to shop online which has accelerated e-commerce sales. Gupta and Singh (2020) in their research have examined the factors of consumers' perception in the Indian context. They also considered the effect of related unintended factors and emotions as the practice is comparatively new to the consumers of a developing economy. In the report published by authors of McKinsey (Baig et al., 2020), have drafted out a recovery plan for traders and retailers. Their plan constitutes of a digital route. Concluding from their research, authors state that companies should now align their businesses to digital channels for a speedy recovery. Similarly, businesses should engage in consumer behaviour research to identify new patterns and preferences with help of data-analysis and AI tools. Businesses should start investing in technology that makes the digital shopping experience smooth for the consumers. Tayade (2021) has discussed the effects of changing consumer behaviour and increased e-commerce sales on store-based retailers. He has insisted that it would be quite challenging for physical retailers to flourish in the 'new normal' world especially at a time when consumers were quickly drifting towards digital channels. Researchers Gavin et al. (2020) have discussed the growing increase of digital interactions in businesses. They stated that the pandemic

has increased digital sale in B2C as well as B2B space resulting in a change in consumer spending patterns.

Research manuscript by Chauhan and Shah (2020) describes radical behavioural changes that have taken place amongst the consumers. In early days of the pandemic, concerns about the availability of essential goods led to stockpiling of essentials by them. Hygiene and health-care products have quickly replaced apparels as 'essential' goods. Salary-cuts and decrease in income have impacted the saving tendency of consumers. Consumers were unwilling to splurge on purchase of discretionary items. Supply-chain disruptions have impacted the supply of FMCG products to retailers. But as a whole FMCG has not been experiencing any substantial slowdown. Consumers are now purchasing and paying through omni-channels that have paved the way for digitalisation in retail.

In his research, Mishra (2020) specifies various impacts of COVID-19 on Indian retail industry and changes in consumer behaviour. Further, it discusses the strategies that will help build a resilient retail sector in India. Retail sector was facing challenges which included liquidity crunch, low foot-fall in stores, disruptions in supply chains, managing consumer demands while ensuring safe store operations. The pandemic had changed the retail scenario completely. Brand loyalty was on a decrease as consumers were ready to purchase local products for lower price. Digitalisation of retail industry had been accelerated by the pandemic. Traditional store-based retailers needed to adopt the online channels. So, in order to be resilient, retailers needed to adopt omni-channel retailing, have a dynamic supply chain and serve the customer through the channel consumers are comfortable with.

Report by Dev and Sengupta (2020) discusses the impacts of COVID-19 on the Indian economy. Demand and production chains were severely impacted. Developing countries like India had far graver consequences in the year FY21. Sahoo and Ashwani (2020) have discussed that COVID-19 has impacted trade, manufacturing and production in MSME. Researchers through their data analysis stated that pandemic induced economy disruption has led to an economy contraction of 3.5% while the manufacturing sector may shrink between 5–20% depending on best to worst case scenarios. The pandemic had impacted Indian exports. Research conducted by Baldwin and Mauro (2020) discusses the ripple effects of the pandemic on the global economy. Movement restrictions across the globe caused deep supply chain shocks which had a cascading effect on industrial production, manufacturing, etc. G7 countries and China were the worst hit initially. Hence, their despair caused a 'supply-chain contagion' that spread onto every nation.

Researchers Mehta et al. (2020) have stated that many of the behavioural changes in consumer are long-term in nature. Most of them are amongst the urban consumers. Pandemic has made consumers conscious about their health. The tendency to purchase hygienic and healthcare products was here to stay. Similarly, consumers will now continue using digital channels to purchase essential and non-essential channels even after the pandemic. Agrawal et al. (2020) have laid out the prominent effects of the novel coronavirus on the Indian economy, particularly on supply-chains. Authors have specified the various barriers that were faced by globally connected and intricate supply-chains. The first major blow was the shortage of raw-materials as exports coming in from China were completely stopped. Furthermore, supply-chain had to face problems such as labour shortages, liquidity crunch, bottle-neck in last mile deliveries, lack of nation-wide and local transport facilities amongst many other things.

Goel et al. (2021) linked the supply-chain of nations with the economic growth of that country in their research paper. They have discussed the effects of pandemic on supply-chain and logistics of 130 nations. Authors have stressed on the fact that nations should put efforts to quickly bring the disrupted supply-chain back on track. Input and output performance of a supply-chain determines the growth of a country. Authors discussed that the pandemic had created a demand-supply mismatch as a result of disproportionate consumer demand and suspended manufacturing activity. This will create a bottleneck in the recovery channel. Sharma et al. (2020) have discussed effects of supply-chain disruptions on top 100 NASDAQ firms using data on twitter. They have suggested that firms need to restructure their supply chain with help of technology in order to build an agile and sustainable supply network. Research conducted by Biswas and Das (2020) has identified that the pandemic has resulted in four barriers to the supply-chain which are labour shortage, raw-material scarcity, transportation hurdles and liquidity crunch. In the given research paper, Seetharaman (2020) has discussed the new digitisation opportunities that the pandemic presented to Indian businesses. She has stated that while no amount of research can lay out the exact impact of the pandemic on the businesses, but store-based retailers who were able to quickly restructure their business models and adapt to digitisation would revive faster than others. In the new normal 'essentiality' of a product sold by a firm will determine the length of revival period of the firm. Firms should try to encash on the opportunities presented by increased demand for 'essential' goods.

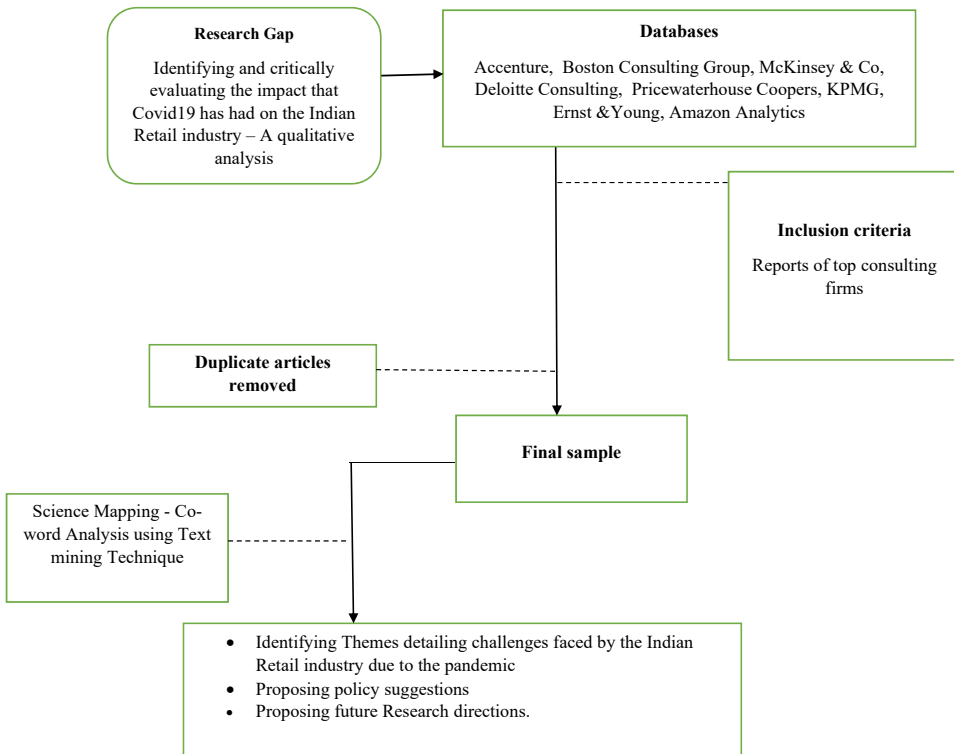
The manuscript of Shetty et al. (2020) discusses emerging trends in retail and FMCG sector as result of the pandemic. It states that only those companies which will quickly adapt to these changes will survive in the new post-COVID world. The onset of the pandemic saw initial trends such as panic-buying of essentials commodities by the consumer. Later on, extended lock-down led to disruption in supply-chains and FMCG retailers witnessed drying up of inventories. This resulted in a new trend in the FMCG sector of D2C selling. Many leading FMCG companies tied up with delivery service providers to directly deliver the goods to consumers. Omni-channel retailing has emerged out as the clear winner during the pandemic. Local Kirana stores received the most traction by the consumers for purchase of essential commodities. Singh et al. (2020) stated that FMCG sector saw steep interest in essential commodities amidst transportation difficulties and logistic challenges. Authors have suggested that while FMCG sector will quickly revive but retailers need to adapt new technologies such as digital payment methods, direct to consumer channels, etc. In the journal article, (Jain and Kothari, 2020), authors have discussed about the increased adoption of digital payment during the pandemic. Digital payments in grocery stores, pharmacies, online shopping, etc. have increased. Authors attributed this increase to fear among consumers regarding transmission of virus through cash and increased online spending by them.

The pandemic has induced a huge economic crisis and adversely impacted the retail industry. The current study (as detailed in research design – Figure 1) investigates and aims to give a bird's eye-view of the impact of COVID 19 and challenges faced by the Indian Retail industry primarily in 2020 due to the onslaught of the coronavirus. It explores and captures the diffusion and discovery of information about the various facets of the impact of the virus on the Indian retail industry using reports published by top consulting firms, i.e., Accenture, Boston Consulting Group, Mc Kinsey and Company, Deloitte Consulting, Pricewaterhouse Coopers, KPMG and Ernst and Young, Amazon analytics report. Furthermore, in order to gain a deeper insight into the research subject,

researchers have engaged in extensive study of research manuscripts and articles too. The current research aims to delve into assimilating available information and subsequently statistically analysing the same with the objective of:

- 1 identifying and critically evaluating the impact that COVID19 has had on the Indian Retail industry
- 2 suggesting measures and avenues that Retailers should focus on with a perspective of revival of the Indian Retail industry and getting back the industry on the trajectory of growth.

**Figure 1** Research design (see online version for colours)



This was done through a qualitative analysis, i.e., by the text mining technique in R. Data retrieval, data extraction, classification and grouping of information and comparison of data are key elements of text mining. The contribution of this study lies in the cross-section text analysis of report publications of top consulting firms and availability of a micro perspective of the related taxonomy. It gives a bird's eye-view of the extant research. The study uses text mining techniques to analyse compendium of reports related to the topic of study and provide a direction in theoretical, empirical and applied research to researchers, retailers and policymakers. In the backdrop of the adverse impact of the novel coronavirus it gives a direction to senior management of retail companies with regards to areas and aspects that they can focus on for revival of the industry.



### 3 Material and methods

Text mining focuses on computerised investigation of large pools of data and on discovery patterns amongst them. It performs knowledge discovery operations on labels associated with each report or document and seeks to extract pertinent and relevant information from an unstructured textual data pool. It has been accepted widely by analysts as an analytical tool for examining of data. It allows researchers to extract quality information and evidence with the assistance of computational tools and techniques from a large corpus of unstructured data available in reports published by top consulting firms analysing the impact of the pandemic on the Indian retail industry.

Machine learning and natural language processing (NLP) has assisted the process of mining of data to identify patterns and topics in the text. This process of data analysis and extraction of topics or theme is also known as knowledge discovery and is supported by machine analysis of text. Knowledge discovery in databases (KDD) has been defined by Fayyad et al. (1996) as ‘the non-trivial process of identifying valid, novel, potentially useful and ultimately understandable patterns in data’. It has a multidimensional method to it which constitutes several activities from data collection to knowledge interpretation.

Text mining comprises of activities involving data collection to knowledge interpretation. This process primarily involves five steps:

- 1 Data collection
- 2 Data cleaning and pre-processing
- 3 Data transformation
- 4 Data mining, i.e., classification, clustering of data, etc.
- 5 Data interpretation and knowledge discovery.

The current study adopts the KDD process of text mining for meta trend analysis of textual data, i.e., the compendium of reports published by the top consulting firms related to the impact of the pandemic on the Indian retail scenario.

#### 3.1 Data collection

The pandemic has demonstrated to be a major social event which has created huge consequences for our social system (Teti et al., 2020). In the current study a qualitative approach through decoding of reports and publications have been adopted by the researchers to help them capture deeper meanings from the dataset of reports published by the top consulting firms relating to the impact of the virus on the Retail industry in India. The researchers implemented qualitative analysis, a useful method for analysing this phenomenon. The analysis is categorised by the systematic process of coding the data to understand the meaning and description of the reality faced by the retail industry by identifying the inherent theme. (Zhang and Wildemuth, 2009)

#### 3.2 Data cleansing and processing

On the downloaded data from the reports published by the top consulting firms, text mining technique was applied for the purpose of automated information extraction from unstructured text data (Rajman and Besancon, 1998). Text mining technique is a

scientific process of identifying trends from unstructured textual data, and helps gain a structured perspective into the themes of the dataset and investigate the dynamics of the study (Ramage et al., 2009). Noisiness of the data was cleaned with the help of the R-Programming (R) and statistical software. In the R package data cleaning task is accomplished by means of the library package 'tm'. Text tidying consisted of converting the entire text into lower case, removing the 'stopwords' and punctuation remarks, removing of numbers and whitespaces. Thus, this data process cleaning helped derive the main 'words' being frequently used in the abstracts and identify the topical themes. On eliminating of all noise and cleaning of the data, the pre-processing of the Corpus was undertaken. The next step involved converting of the pre-processed text into a structured format for actual computation.

### *3.3 Data transformation*

The structured cleaned 'Corpus' that was derived was subsequently transformed into a 'TermDocumentMatrix'. The TermDocumentMatrix describes the frequency of terms that occur in a structured dataset and is a mathematical matrix. The rows correspond to documents in the structured text whilst columns tally to the terms. The TermDocumentMatrix helps characterise the topic of a document by the frequency of semantically significant terms.

### *3.4 Establishing trustworthiness*

In the current study, two researchers were involved in separately interpreting the reports that have published by the top consulting firms regarding the impact of the pandemic on the Indian retail industry using unsupervised machine learning to ensure inter-rater reliability (Gwet, 2014). The researchers separately labelled the topic and themes that emerged from the analysed structured dataset and that became the theme to which that cluster represented.

## **4 Results and discussion**

### *4.1 Data mining*

The transformed matrix was subsequently used for data analysis. Data analysis was done based on three models; the first being word cloud, second being topic modelling and third being latent semantic analysis (LSA). 'Word cloud' displays text data in a graphical form by investigating the patterns of word or phrases. It is a collection or cluster of words with the more frequently appearing words in the dataset appearing bigger and bolder in the visual representation. Word cloud has been defined as "the visual representation of words for a certain written content structured as per its frequency (Jayashankar and Sridaran, 2016). Research by Sinclair and Cardew-Hall (2008) state that word cloud is the first stage for an exhaustive analysis of textual data. Post word cloud visualisation, topic modelling of the themes and topics was conducted for an in-depth analysis of the reports

Advancement in NLP and machine learning has led to the development of new techniques for finding patterns of words in document collections with the help of hierarchical probabilistic models known as topic modelling. This empowers researchers

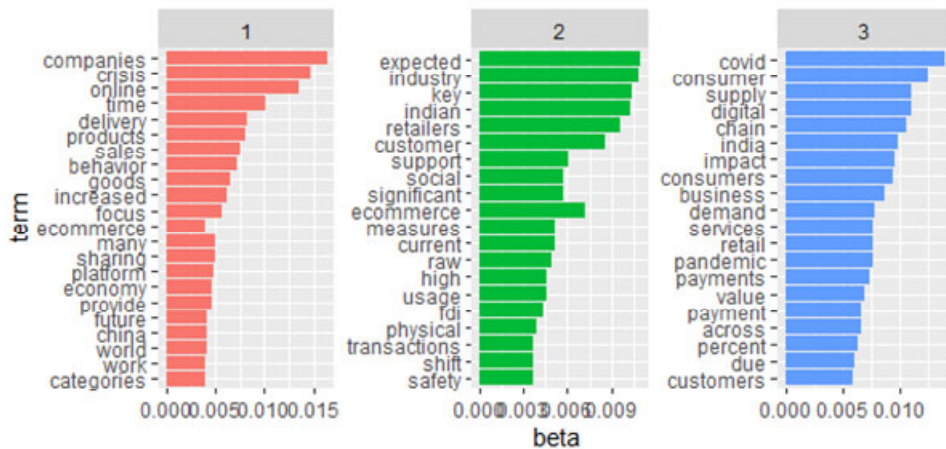


supply-chain disruption accompanied by nation-wide movement bans prompted a shortage of raw-materials and logistics disruption. This was accompanied by a labour force crisis due to exodus of migrant workers. Hence retailers faced inventory, productions and distribution challenges. In terms of changes in consumer behaviour, words like stores, shift, digital, value, local, etc. appeared. It directs the attention towards shutdown of physical retail and health concerns amongst consumers which prompted them to shift to digital format which resulted in sky-rocketed growth of this sector during the pandemic. Appearance of word 'local' refers to the consumers, who due to health fears, turned hyper-localised and engaged in shopping in their close proximity.

#### 4.2.2 Topic modelling

Topic modelling analysis of reports published by the top consulting firms was subsequently analysed to categorise the key themes representative of the impact of the virus on the Indian retail industry. These represent the main topics or key phrases that emerged from the reports published by prominent consulting firms such as Accenture, Boston Consulting Group, McKinsey and Company, Deloitte Consulting, Pricewaterhouse Coopers, KPMG and Ernst and Young, amazon analytics reports.

**Figure 3** Topic modelling (see online version for colours)



The two researchers subsequently discussed the terms that were categorised in three broad topics (Figure 3) which emerged as a result of our topic modelling analysis on above mentioned reports. These topics were further categorised into common themes.

- Topic 1 discusses world, China, crisis, economy, sales alongside consumer behaviour and ecommerce. These words point towards the impacts of COVID-19 on global economy. The adverse economic consequences were a result of government enforced lockdowns and pandemic induced health fear amongst the consumers. Pandemic forced consumers to work from home and stop out-door activities such as gym, shopping, dining out, outdoor social gatherings, etc. Subsequently people started ordering online, henceforth, companies shifted focus towards developing their e-com delivery channels.

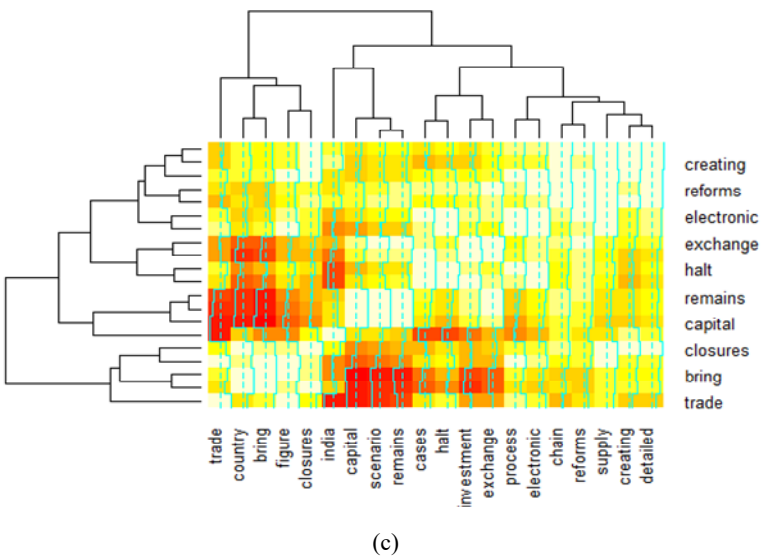
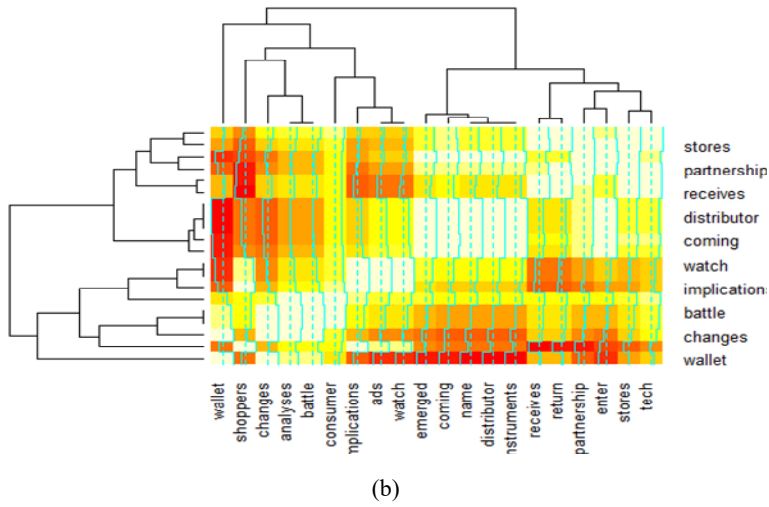
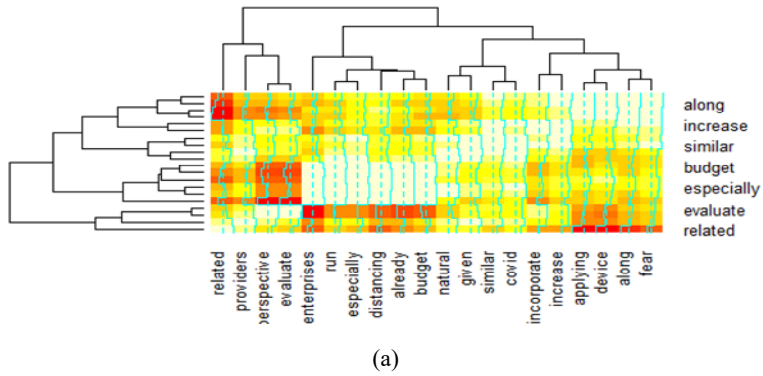
- Topic 2 discusses Indian retailers, e-commerce, physical stores, customers, online transactions alongside safety measures and social significance. These terms point towards the changes that occurred in the digital and physical retail space as a result of changes in consumer behaviour. Terms like customers, ecommerce, online transactions indicate that consumer behaviour underwent significant shifts. Due to a change in consumer's behaviour and habits, 'online-sales' have soared high. As physical stores were shut, these retailers had reached out to their consumers through newly- built online channels, thus, giving rise to offline-online channel integration. Surge in 'digital transactions' could be a result of contact-less payment preference of consumers. Terms like safety measures point towards the new safety provisions that physical store retailers had to follow to maintain social distancing measures inside the store to safeguard consumers and their own employees. This could result in increased costs for retailers.
- Topic 3 discusses terms such as supply chain, COVID Impact, demand, value, consumer alongside retail businesses. These terms refer towards the supply-chain distress and demand fluctuations that retailers have faced due to pandemic. Supply distress could be due to sourcing, transportation and productions delays that retailers underwent during the lockdown period. These delays could be due to logistic and distribution trouble as lockdown made transportation of raw-material and finished goods difficult which affected supply. This was accompanied by disproportionate 'demand' as customers engaged in panic buying of essentials initially while demand for discretionary goods has fallen down. Retailers hence went through a demand-supply imbalance.

#### *4.2.3 Latent semantic analysis*

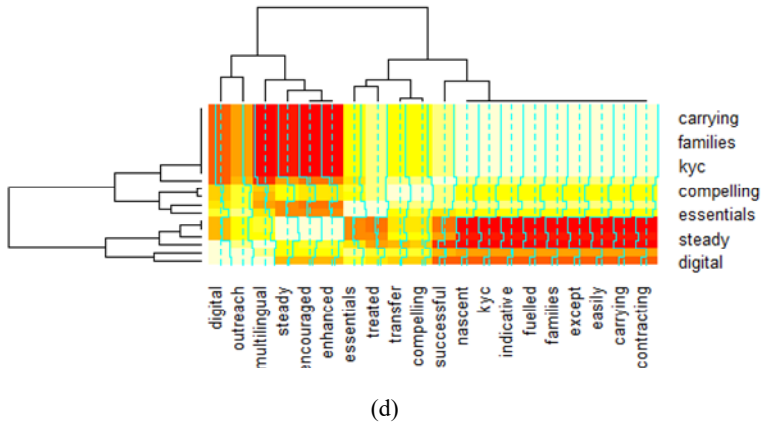
The reports were also analysed with the help of LSA. The technique of LSA is used to extract concrete information from a collection of documents or text data. It was developed by Landauer and Dumais (1997) to identify patterns in a large set of textual data. LSA creates an assessment of connotation based on the choice of words used in the document. It creates a relationship of statistical occurrence. It extracts meaning from a text using the frequency of occurrence of the words. Calculations are based on detailed pattern of occurrence of each word over a large array of written passages. The LSA involved steps of preparing documents, creating the semantic space, projecting pseudo documents and comparing vectors. Thereafter, the semantic space was analysed by creation of heat maps and cosine similarity. This was done with the help of R, the statistical computing software environment.

Researchers after analysing the reports of prominent consultancy firms such as Accenture, Boston Consulting Group, McKinsey and Company, Deloitte Consulting, Pricewaterhouse Coopers, KPMG and Ernst and Young, amazon analytics report, found that terms such as 'COVID', 'consumer', 'distancing', 'fear' 'supply chain', 'digital', 'demand', 'impact', 'India', 'business', 'online', 'Price Waterhouse', etc. emerged as the predominant terms. Based on this outcome a heatmap of the key terms, i.e., COVID, consumer, supply chain, demand and digital was subsequently worked upon (Figure 3).

**Figure 4** Heatmaps, (a) COVID (b) consumer (c) supply chain (d) digital (see online version for colours)



**Figure 4** Heatmaps, (a) COVID (b) consumer (c) supply chain (d) digital (continued) (see online version for colours)



A heat map is a data visualisation technique which portrays the degree of a phenomenon as colour in a two-dimensional space. The variation in colour, i.e., hue or intensity is indicative of the clustering of the phenomenon and uses the system of colour coding to represent different values.

The heatmap for COVID refers to three clusters. First cluster refers to the fact that enterprises and businesses now have to evaluate new perspectives to continue in the post COVID-world in response to COVID-19 inflicted impacts. Terms such as enterprises, perspectives, evaluate, increase, etc. have appeared. The second cluster, by using terms such as distancing, budget, COVID, etc. signifies that this pandemic has created paradigm shifts in the way societies lived such as introducing social-distancing norms as well as restructuring of household budgets. Third cluster implies that businesses have to dynamically incorporate changes that will allay COVID-related fears amongst consumers and provide them a safe shopping experience.

Consumers heat map has one cluster exhibiting the fact COVID-19 has had implications on consumer behaviour which retailers need to analyse as terms like shoppers, changes, stores, analyse, etc. have appeared in it. Consumers have changed their pattern and ways of expenditure due to the pandemic. Retailers need to adapt to these changes by maintaining dynamic partnerships with their distributors and restructuring the value-chain. Another cluster depicts that certain instrument have emerged in retail space during the pandemic as terms like instruments, distributors, emerged etc have appeared. Example of new instruments can be: offline-online store integration in response to the changed consumer shopping behaviour which retailers in partnership with their disruptors need to adopt. Last clusters clearly portray that technology is going to drive the retail space forward in the post-COVID world as terms like tech, stores, partnership were predominant in this cluster. Need of technology will give rise to B2B partnerships in retail sector.

Supply chain heatmap has two clusters. First cluster, with use of terms like trade, country, closures, halt, exchange portraying that COVID-19 induced lockdown brought closures to trade and business across countries. This gave a globally integrated supply chain shock. Sourcing and exchange of goods across places became difficult in the absence of transportation networks. Second cluster signifies that as the current scenario

of high COVID cases in India continues to affect our supply-chain. Suppliers now have to invest their capital on making the supply-chain more agile. Third cluster clearly exhibits the fact that new reforms are required to make supply-chain more dynamic and digitalised.

The heatmap for digital is divided into three clusters. First cluster, with help of terms such as digital, outreach, encourage exhibits that pandemic has amplified the growth of digital retail Consumers, in presence of movement ban, reached out to e-commerce to fulfil their day to day needs of essentials. Second cluster by using words such as KYC, transfers, nascent refers towards the increased use of digital transactions during the pandemic. third clusters display that factor such as fear of contracting the virus by families will fuel the growth of this sector in the future.

## **5 Discussion and conclusions**

The results of the data analysis of collected dataset through a qualitative approach and use of analytical models like word cloud, topic modelling, LSA have highlighted the major impact of COVID-19 on Indian retail sector as: changes in consumer behaviour and shopping pattern, supply-chain disruption, demand fluctuation, digital transformation of the sector and liquidity crunch being faced by physical store-based retailers.

Data analysis revealed that COVID-19, which initially began as a global pandemic has now become an economic catastrophe, with severe ramifications on retail sector globally and in India. The global pandemic has shaken the foundations of retail sector and has pushed it into a recession. While on one hand the pandemic caused temporary impacts such as disruptions in value-chain, logistics, manufacturing and shutting down of non-essential businesses, on the other hand, the pandemic has made a drastic and long-term impact on consumer behaviour. Essential commodity businesses witnessed a sudden rise in demand in early days of lockdown due to panic buying amongst its consumer. Fulfilling this sudden high demand amidst a supply-chain disruption was a challenge for these retailers. Retailers around the nation complained of finding difficulty in maintaining adequate inventory due to supply-chain shocks. Transportation and logistics disruption made sourcing and last mile deliveries of goods a challenging affair.

Terms like value, local, fear in the data analysis indicate that consumers are breaking away from brand loyalty and shifting towards more localised and high-in value shopping. Recurrence of terms like digital, tech and online highlights the shift of consumers towards digital shopping. Word cloud indicates that pandemic induced 'supply-chain' disruptions and shut-down of 'physical stores' led to a shift in 'consumer behaviour' which accelerated the growth of 'digital' retail. Topic modelling highlighted the far-reaching economic consequences that were unleashed on the world by the pandemic. Some of these consequences were supply side manufacturing constraints as well as declining businesses an outcome of low demand for non-essential categories as consumers staying indoors. The second topic brought to the forefront the changes that occurred in the digital and physical retail space as a result of changes in consumer behaviour. These changes could be a result of the fact that most physical retail outlets, except essential commodity retailers, remained closed during the lockdown period. Changes in consumer behaviour led to online sales soaring high. The third topic shed light on supply-chain distress and demand fluctuations that retailers faced due to the pandemic. To continue operations in the post COVID-world in response to COVID-19



inflicted impacts, businesses and retailers have to evaluate new perspectives which can address paradigm shifts in the way societies live and changes in consumers spending patterns. Technology will be a key driver in the retail ecosystem and will help increase the outreach for the retailer. Reports studied by researchers have stated that some of the impacts of the pandemic are long-term in nature and retailers have to learn a way out to quickly adapt to the changes.

In background of the pandemic a few of the major challenges thrown at the retail industry are loss of revenue, declining consumer demand, supply chain disruption, changing consumer behaviour, more mind-full shopping and brand loyalty and rise in E-commerce (digital and phygital retail). CAIT reported that Indian retail industry suffered a loss of 5 lakh crores rupees in first 40 days of lockdown (Jain, 2020) Much of this loss occurred in discretionary commodities. Retail sector which contributes almost 40% of total consumption in India saw a sharp decline in sales owing to low consumer demand. Private consumption declined by 26.7% in 2020 (Dua, 2020). Survey conducted by Mckinsey revealed that 75% of consumers have agreed to being very cautious while spending on discretionary goods such as apparel, durables, etc. (McKinsey and Company, 2020).

Movement restrictions and labour shortage made sourcing of raw-materials difficult which adversely affected the production. Last mile deliveries paused amidst logistics disruption. Distributors across India were not able to transport their merchandise from warehouses to retail outlets. Hence, retailers saw their inventories being drying up without getting restocked.

Consumer shopping behaviour has gone through a significant change during the pandemic. Many of them are permanent changes. These changes vary from panic buying of FMCG goods to cautious spending on discretionary products. Consumers are now engaging in more mindful-shopping. McKinsey revealed that 61% of Indian consumer have agreed to this while 45% stated to spending less on discretionary goods. (McKinsey and Company, 2020). Consumers are engaging in planned purchases instead of impulse buying. Brand loyalty has taken a paradigm shift. Consumers are searching for more value in every purchase.

It has been stated that pandemic has accelerated the growth of E-commerce by at least 4 to 5 years. The sector grew by 36% in the last quarter of year 2020 with essential products being the biggest beneficiary (The Hindu, 2021). 'Phygital retail' is the new term in town. Many store-based retailer who saw low physical foot-fall due to the pandemic have adapted to providing phygital experience to their consumer. Word 'Phygital' refers to giving both 'store-based' and digital experiences to the consumers. The Retailer provides virtual tour of the store to the consumer and showcases the merchandise through video calls.

Thus, in order to adapt to the 'new normal' retailers will now have to build an agile system of retailing comprising of an integration of old and modern channels that can withstand changes. The supply-chain needs to be restructured in to a more sustainable, dynamic and equipped with modern technologies that adapts to the newer channels of retailing. It's no longer a 'physical' vs. 'digital' retail in this 'new normal' world. The retailer who will integrate physical and digital channel to fulfil demand and adapt to various other channels such as omni-channel retailing will survive now and flourish in the long-term.

## **6 Managerial implications**

An implication of the adverse economic consequences of the virus was that low productivity levels along with declining profitability would impact business sentiments, weaken investment scenarios and lead to resultant declining incomes and consumer demand. Retailers, as a consequence of shut down and low footfalls after reopening, saw low profitability which put the retailers under grave liquidity distress. As ecommerce was expected to grow even after the virus ebbs and industry recovers, Senior Management of Retail industry should strategise accordingly. Retailers need to plan for integrating technological advances in their business operations. This would give them multiple gains and will considerably help improve not only their brand equity but also profit margins. Also, policymakers in India need to draft and put in place explicit guidelines for the ecommerce industry. This would enable omnichannel and phygital retailing to operate seamlessly in the retail ecosystem. The virus also brought to light the demand-supply imbalance that was an outcome of supply chain disruption and lowering consumer demand for discretionary products. Thus for any such untoward situation in future, retailers and policymakers should plan for alternate supply chain, pursue a China + 1 strategy, look at options of onshoring, friend shoring, etc. Restructuring the value chain is key. Last but not the least, while ensuring social distancing norms in retail stores had resulted in increased costs for retailers, it is important that even with the abatement of the virus, health safety provisions should be in place and a way of life for retailers.

## **7 Future research directions**

The pandemic has triggered a plethora of challenges for the retail industry not only in India but for countries across the globe. The current study aimed at synthesising and bringing in coherence to the rapidly growing body of research related to consequences of the pandemic on the Indian retail industry. Future research can be undertaken in understanding and analysing the impact of the virus on the retail industry worldwide and also country specific. Also, experts can research into the viability and success of strategies that retailers adopted to counter and minimise the impact of the virus on their businesses during the two years of the pandemic. Future research can be undertaken in analysing changing consumer patterns and studying the resilience of existing retail supply chains, etc.

## **8 Limitations**

This pandemic is an unprecedented event and very uncertain in nature, hence, knowledge material such as retail sector related research manuscripts, and articles, etc. are present in a limited number on the web. As a result, researchers only analysed reports published by prominent consulting firms. Presence of more information related to the research subject could have given more insight to the researchers.

The researchers have framed a conclusion based upon a qualitative analysis of the reports published by consulting firms. A quantitative analysis could have given a more accurate result. But due to absence of adequate knowledge material for research, researchers carried on with a qualitative analysis.

Another major limitation could be that at the time of writing this research paper, second wave of the pandemic had not struck the nation. Hence, researchers only analysed reports that laid out implications of first wave of the pandemic on retail sector. The uncertainty related to the pandemic such as doubts regarding its end, resurgence, etc. has made implications related to it a little complex in nature.

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