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Early Industry Opportunities and Challenges in 4.0 for Supply Chain Management Using with Iot

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Abstract

Growing information and Internet of Things (IoT) are important parts of Industry 4.0 for Improving Supply Chain Management (SCM). The use of smart technologies has led to what called “smart supply chains”. For the industrial and practical communities, it is essential to comprehend how industry 4.0 and connected IoT influence smart supply chains and how those chains develop by aid of cutting – edge technologies. Based on interviews with retail industry managers in India, this study uses grounded theory to explore the potential benefits and drawbacks of implementing IoT in supply chains. With the use of NVivo's thematic analysis, we can see that introducing IoT devices into a company environment leads to better tracking of inventory, data collection, communication with partners, and overall business information. Inadequate interoperability between partner systems, a lack of top-down initiative, the high price of adopting new technology, the resistance of key players to change, and a lack of transparency and trust in data all present difficulties for the retail industry. In this study offers benefits of IoT as proof of concepts that reinforce the speculate decision concocted to the IoT, illuminates adoption hurdles, and generates proposals for future investigation.

Keywords: IoT, Industry 4.0, Retail, IoT, Supply Chain Management.

1. Introduction

A supply chain manager said, "The influence of the Internet of Things is wild," supporting this study. It is essential to business operations in the manufacturing and services sectors. Supply chain management, which is a systematic way to managing asset fows from sourcing raw materials, product manufacrturing, and delivery to end consumers, has a significant impact on the business aim of the supply chain partners Yiqin yang (2023). The growing IoT literature supports this view (Ben-Daya, Hassini 2019; Mishra et al. 2016). The information may be exchanged between things and people, machines and machines, thanks to the Internet-encabled worldwide clever platform of distinctly accessible gadgets with sensing, actuation capabilities and networking (Atzori, & Morabito 2010; Birkel 2019; Borgia 2014; De Vass, 2018). Gartner (2019) stated that the number of enterprise and automotive IoT touchpoints will anticipated to reach 5.8 billion in 2023. Industry 4.0 considers the IoT a cyber – physical system foundation technology due of its power. The “smart factory” (Ben-Day 2019; Hofmann) uses the internet to communicate and regulate autonomous, knowledge and sensor-based manufacturing systems.

Digitalization is the best answer for enterprises confronting increased goods flow and deficiency of evidence for quick decision-making (Huddiniah 2019). IoT adoption at endpoints is essential for a "smart" supply chain that overcomes real-time data gathering and exchange restrictions (Attaran 2020; Birkel 2019; Sharma 2020). Because to its potential, affordability, and disruption, developing IoT must be integrated into core ICT infrastructure (de Vass 2018). Yet, leaders encounter various deployment obstacles (Mishra et al. 2016). Literature gradually examines SCM digital advancements that impact the company model (De Vass, 2020; Sharma 2020). Mishra et al. (2016) identify few supply chain IoT adoption studies. Attaran (2020) agrees that this research is theoretical. Hence, Mishra et al. (2016) recommend studying "... the

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drivers and barriers of IoT implementation and adoption in SCM". Haddud et al. (2017) studied the benefits and disadvantages of IoT using academics instead of field users. The lack of empirical information creates it problematic for enterprises to make educated IoT investment decisions, according to Kenney et al. (2019). (Attaran 2020; Birkel 2019). COVID-19 has made global supply chain management more ICT-intensive. Companies adopted remote operations solutions as a result of the outbreak (Baldwin & Tomiura 2020). Companies adopted remote operations solutions as a result of the outbreak (Baldwin & Tomiura 2020). The acceptance and use of IoT in SCM for enactment development is therefore the subject of this study. Indian retailers are at the lead of IoT and other technologies because they aim to provide in-store customers with a digital shopping experience while establishing their online presence. Customers now have more power over when, where, and how they acquire goods and services because to this digital disruption (Deloitte 2020). Retailers are capable of overcoming new technical challenges to meet consumer demands (Caro 2019). The deep incorporation of digital raised area is changing the way that retailers compete (Kenney et al. 2019).

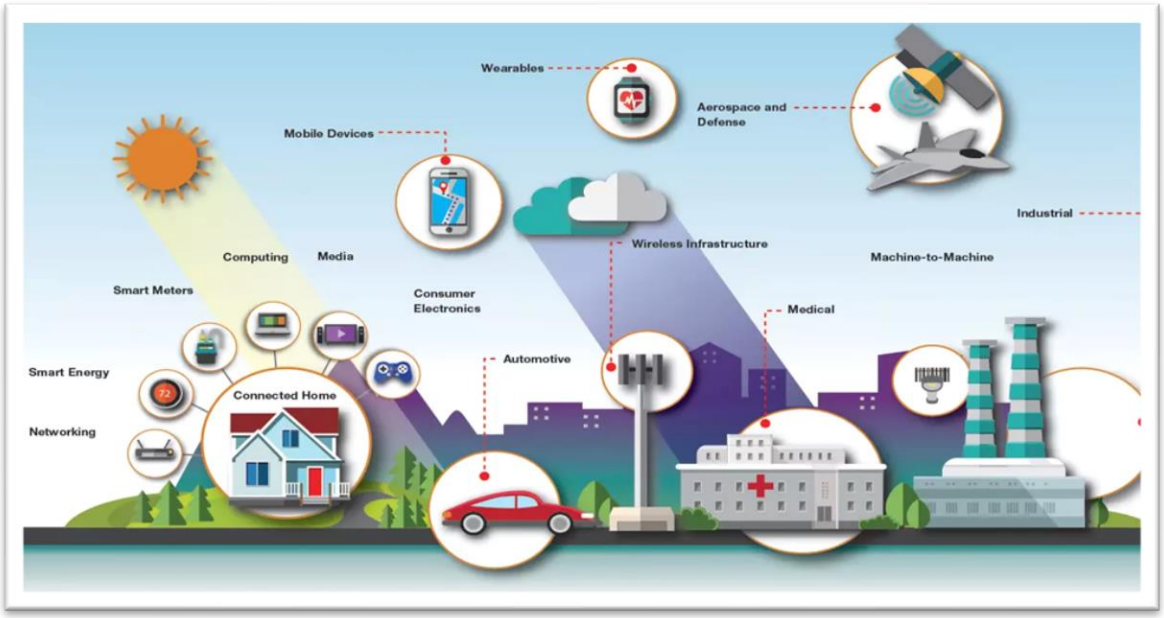

Figure : The implications of IoT and Industry 4.0

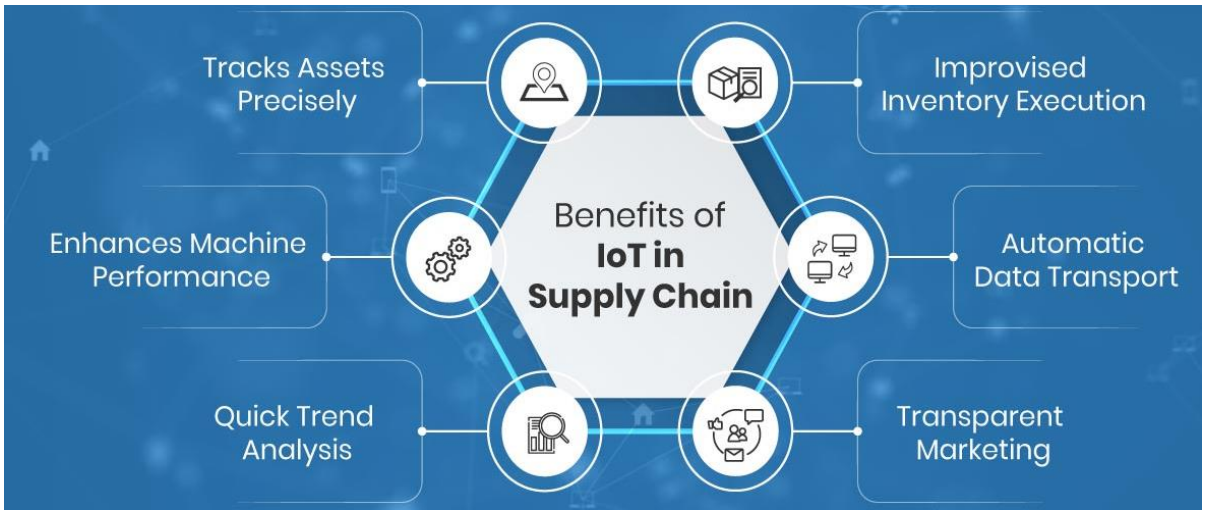

Figure : Benefits of IoT in SCM

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2. Review of Literature

The present study has been identify the literature concepts of three factors like the IoT, Inductor 4.0 & IoT, and IoT & Supply Chain Management are given table

Table concepts of Literature review

Literature concepts	Author and Years	Identification of Literature
Internet of Things (IoT)	Balaji 2017, de Vass 2018	IoT technologies connect the digital and physical worlds.
	Birkel 2019; Tu 2018	The MIT Auto-ID Center for SCM coined the phrase "IoT" in 1999 to suggest a means to track things using RFID and an electronic product code (EPC).
	Mishra et al. 2016;	RFIS, sensors, actuators, phones and unique smart objects are now "things"
	Atzori et al. 2010	GPS telematics, Social media, data enhance the IoT platform.
	Evtodieva 2020	Self-aware, controllable, networked, adaptable, transformable, synergistic, self-decisive, and strategic, the IoT
	Manavalan 2018	Scholars expect the IoT's qualities and capabilities to benefit society, the economy, and the environment.
Industry 4.0 and IoT	Ben-Daya et al. 2019	The Internet enables Industry 4.0's automation and digitalisation
		Mechanical power, mass production, and the digital revolution were the prior industrial revolutions.
	Hofmann 2017; Manavalan 2018	Industry 4.0 aims to revolutionize industrial production.
	Ben - Daya et al. 2019	Industry 4.0 requires Internet-connected logistics process integration.
	De Vass et al. 2018.	The IoT platform connects suppliers and clients to improve SCM.
	Manavalan 2018	IoT applications can help early Industry 4.0 companies track assets, materials, transport, and risk.
	Kaya 2020	SCM's Industry 4.0 transformation is hindered by separate data silos, which make data unavailable
IoT and Supply Chain Management	De Vass et al. 2018; Kaya 2020	Universal IoT, SCM uses it to link vendors, acquire real – time growth data from merchants, inventory tracking, joint ordering, and quality monitoring an enhanced reversed logistics.
	Hopkins 2018	Vehicles with sensor technology can relate with their ambiances in real time, allowing quicker and vehicle platooning to minimize travel times, congestion, and infrastructure capacity.
	Büyüközkan 2018	IoT-enabled real-time data helps investors improve operational decisions and SC and firm strategic outcomes
	Hopkins and Hawking 2018	Describe how IoT and big data analytics increase effective proficiency, and atmosphere in a logistics organisation.
	Evtodieva et al. 2020; Kaya 2020; Mishra et al. 2016	Yet, actual research on the IoT's use in SCM rarely integrates management and operational perspectives
	Kaya (2020)	Conceptualizes the IoT in SCM,
	Ataran 2020	Imples that proof –of – Concept. t.
	Caro (2019)	Define IoT activities on an opportunity map by their worth in decoupling retail supply and demand, highlighting its genuine potential in unforeseen advantages after adoption.

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3. Research Methodology

In the research study qualitative techniques was applied. It helps managers understand complex SCM by studying the interaction between clients and technology. Ardolino et al. found the phenomenon in its early stages (2017). The current research design yielded the table

Table Research Design

Research Design	Description
Research Approach	• Grounded theory (GT) permits researchers to keep an open mind in such complicated and developing research circumstances (Mishra et al. 2016; Charmaz 2007). • GT began SCM IoT research with an open mind (Tu 2018). Facts are used by the GT to derive theory, explain a new phenomenon, and suggest further research. • The GT helps researchers to be receptive to new ideas suggested by emergent patterns (Charmaz 2007). • GT interviews are also analyzed for emergent trends, unlike other qualitative approaches (Mello 2009).
Participant Selection	• This study explores Indian retail SCM senior managers' narratives. Expert interviews can help study a new but understudied topic like retail IoT use (Littig & Pöchhacker 2014). • Participants and their organizations were recruited via Facebook and LinkedIn with signed consent. Non-random selection illuminates a trend (Tu 2018). • Sampling included a variety of retail industries, firm sizes, retail forms (brick-and-mortar, e-tail, omnichannel), and IoT deployment maturity. Participants needed hands-on IoT installation experience. This factor ensured sufficient insight depth and breadth. Interviews totaled 13. • Each of 12 retail enterprises had a senior manager interviewed. Participants also recommended consulting with 3PL service provider, who is leading IoT adoption. • Hence, 3PL-X manager was also interviewed. Most of the sample's merchants use India's largest 3PL, 3PL-X. 3PL's narrative was solely utilised to clarify because he is an anomaly to this study's unit of analysis. • GT literature recommends switching units of analysis (Charmaz & Belgrave 2007;).
Size of the Sample	• GT sample size is widely addressed in qualitative techniques (Guest et al. 2016). "A sample size of nine is sufficient for code saturation, but would only be sufficient to develop a comprehensive understanding of explicit issues in data and would miss the more subtle conceptual issues and conceptual dimensions which require much more data," Hennink (2017) say of interview approach sampling. While 12 interviews may seem inadequate to generalize, the study used GT technique to understand IoT in SCM opportunities and challenges through retailers' actual experiences (Kaufmann 2011). • This exploratory research seeks to capture the daily "complexity, nuance, and dynamic" (Emmel 2013) of IoT in SCM. • 12 talks are plenty to code saturation, comprehend data difficulties, and examine retail supply chain IoT adoption prospects and challenges, but they may error additional delicate theoretical problems. • Conceptual challenges that need additional data (Hennink et al. 2017). Hence, the 12 interviews were sufficient to provide empirical insight about retail SC IoT deployment prospects and obstacles.
Data Collection	• Individual interviews give the interviewer background information and unstructured conversation, yielding valuable data. • Open-ended interview questions explored retail firm perspectives on IoT uptake and use in SCs and encouraged participants to share fresh ideas and truths without parameters (Haddud 2017). This approach identified major themes and allowed researchers to freely discuss their empirical manifestations in participants' retail enterprises.

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	• The interview schedule featured 8 questions below 2 segments: • **Section 1:** used a verbal questionnaire to characterize the Retailer and its SC, the respondent, and their sympathetic of IoT. • **Section 2:** Open-ended questions examined SCM IoT adoption potential and constraints. To reduce social desirability bias, researchers analysed question wording. • Three SCM academics provided critical insight, followed by three retailer pilot interviews to ensure question clarity, relevance, and content validity. 45–1 hour interviews. • GT data collection and analysis occurred during and after the interview. Interviews were free enough to address emergent themes and define a wide variety of conceptual categories (Charmaz 2007). • Interview schedules gradually incorporated subjects and categories from conversations (Kaufmann 2011).
Data Analysis	• GT hypothetical outline employed contented analysis for textual data analysis. GT research used data-driven analytic categories or themes rather than preset hypotheses (Charmaz 2007). • Line-by-line coding, categorization, consolidation, and theme-subtheme linkages were done in NVivo 11, the qualitative data analysis used in software. This involves theme-categorizing transcript parts (Tu 2018). • Axial coding was used to find patterns and links in the qualitative data by creating concept nodes and classifying them into themes. To improve analysis, coding was repeated twice. • An independent researcher coded and cross-checked the results to validate and/or modify the initial analysis.

4. Finding and Outcomes

12 retail sectors represent all Indian Bureau of Statistics retail industry classifications (ABS). Large enterprises (7, >200 people) outnumbered medium-sized firms (5). Brick-and-mortar, online, and multichannel retail enterprises responded. Aspirants also highlighted the IoT as a brilliant integration of various essential technologies evolving in many novel ways (Table 1).

Table Retailer Summery

ID	Code	Exp.	Role of Job	Types of Retail	Key retail form	Size of Firm	First adapted IoT
1	A	2 yrs.	Supply chain manager (SCM)	Cosmetic and toiletry	Omni-channel	Medium	Less than 2 years ago
2	B	09 yrs.	SCM*	Department store	Bricks-and-mortar	Large	Over 09 years
3	C	3 yrs.	SCM	Supermarket	Bricks-and-mortar	Large	4 years ago
4	D	2 yrs.	SCM	Pet products	Omni-channel	Large	4 years at-least
5	E	3 yrs.	Owner	Restaurant/café/take-away	-Do-	Medium	3 years ago
6	F	3 yrs.	SCM	Telecommunication products / Electronics	-Do-	Large	2 years ago at least
7	G	5 yrs.	SCM	Clothing, footwear and personal accessories	-Do-	Large	Over 10 years

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8	H	10 yrs.	IT manager	Motor vehicles parts and Electronics	-Do-	Medium	5 years at-least
9	I	5 yrs.	SCM	Supermarket	Bricks-and-mortar	Large	9 years at-least
10	J	20 yrs.	Store manager	Fuel and convenience stores	Bricks-and-mortar	Large	Before 5 years
11	K	5 yrs.	IT manager	Security and surveillance/ Electronics	Omni-channel	Medium	Before 5 years
12	L	7 yrs.	General manager	Households goods	E-tail	Medium	6 years ago

- SCM (Supply Chain Manager)

This supports the literature's conceptualization (Borgia 2014), Retailer K said, the "Internet of Things", however many don't realize it. A person has at least one or two "Internet touch points" with the outside world ". IoT had grown as a trade request, and all respondenst were positive about its prospective in SCM. "IoT has tremendous potential in SC operations" [Retailer C]. it stated that the [Retailer B], "Such technology that makes our SC smarter and faster, we would look at it in positive eyes". RFID was early IoT for eight retailers: "RFID was discussed 20 years ago. It's not mainstream "I-Retailer. Yet, participant/retailer item profiles, with IDs decrypted for obscurity.

4.2 IoT Development

Applicants' IoT descriptions matched scholarly ones. Retailer I called it "an umbrella term used generally for the mechanisms underpinning it, gadgets capitalising the power of the Internet" [3PL-X]. Retailer K pronounced IoT benefits as reallocating "...device-to-Cloud insights. It can instantly communicate, remotely update gadgets, and get real-time information from anywhere ". No subject SCs used RFID for SC-level identification. Retailer J tested the scenario, but Retailer G had immediate plans: "We are looking at using RFID as one of our items costs minimum 20 to 30 bucks, and a tag will cost only 5 to 10 cents". RFID was less optimistic than IoT owing to cost: "RFID tagging and tracking of low-cost FMCG products still look fairly pricey" [Retailer I]. "RFID will be really convenient, particularly around dating the products within our store," said Retailer D. Retail G, H, and I employed picture recognition, although open and closed standard barcoding was the cheapest short-term product identification method.

All panelists considered the IoT part of ICT infrastructure, although they distinguished it due to its familiarity: " Now, IoT enters India. The market grasps IoT "[Store K]. Six retailers thought the IoT could solve traditional ICT's business needs: "Email and phone discussions to increase purchases are not suitable for planning and transparency." A-retailer.

Proposition P1: Although it cultivates the core concept of drawing on the internet's potency for surplus capability, the evaluation of different forms of IoT in supply chins is not linear.

4.3 Retail SCM – IoT Adaption

IoT digitizes temperature, shape, humidity, and speed (De Vass 2018). 5 merchants RFID box, pallet, and container. Warehouses and shops employed barcode, PDA, RF, laser, LED, and camera-based scanners. "The trend now is using the same device for multiple purposes" [Retailer H] drove IoT device consolidation. Five managers talked using smartphone features. The near-ubiquity of smartphones suggests an attempt to use them as the central integration device. 3PL-X reported two consolidation methods: via fewer expedients through re-assigning roles to smartphones, and using an only SIM card to connect all in-cabin devices. "Using existing devices rather than adding new devices is good for the environment as well," said retailer H. "IoT has been in SCs for many years in various forms" [Retailer K], and all participants indicated their firms utilised the IoT to a good degree as a mix of "things" through various SC processes at different intensities. A, F, and L lagged behind retailers G, E, and H. "If you don't stay with evolving technologies, you are going to lag behind," Retailer G said. "I think some of our limits in the business while competing with large retailers are around technology side; they are so much ahead in terms of IoT at the moment," Retailer L said. "We are observant about what's occurring at the marketplace, we are searching for the ways to do things, but not necessarily leap in right on them" [Retailer C]. Cost, knowledge, and industry ideal held retailers A, F, and L back. Thus, our proposition:

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Proposition P2: While different forms of IoT are evolving with numerous functionalities, the drive for alliance of these devices positively effects the likelihood of its implementation in SCs.

4.4 Retail Supply Chain IoT Proliferation and 3PLs

3PL services introduced most retailers to IoT, except early adopters. The 3PL-X applicant has used IoT in transport systems since 2005 and in DCs since the mid-1990s. All retailers outsource most transport activities to 3PLs, and 8 outsource their distribution centres (DCs). 4PL integrators assemble and manage service providers for retailers K, E, and F. 7 people said technological aptitude was important when choosing a 3PL: "When we look at 3PLs, we always look at transporters with the highest technology, so they can provide the best for us and our consumers" [Retailer L]. Retailer A, E, K, and L noted savings from investing in such technology. 3PL-X agreed, saying they likely won several contracts due to their technology and lost others due to lack of it. Participants also said return-on-investment issues prevent 3PL technology deployment without long-term contracts. "...apart from safety, the end purpose is, you keep the contract," 3PL-X said, adding that "they (retailers) go all the way to assure we have it, then we supply it, but they never use it!" So, a proposal is,

Proposition P3: The 3PL service suppliers play an important part in driving the strengthening of developing technology in SCs.

4.5 Data Collecting, Analyzing and Sharing

Whitmore et al. (2014) believe that contemporary scholarship must explain "how does the IoT fit into the big data movement?" "Having this technology is purely information collection. Your data always limit the depth and effectiveness of analysis," 3PL-X replied. "When I think about IoT, it is data, its capturing loads of data" [Retailer G]. 7 retailers have contrasted IoT data collection to old ICT: "Capturing of the data that we didn't have access to before is a big opportunity we have with IoT" [Retailer H]. Data collectors didn't get its corporate intellect benefit. Data-driven policymaking is leading. "Through data analysis, we have found gaps in our delivery operations" [Retailer A]; "We have been proficient to acquire extra info, more discernibility of evidence and create well results built on infor "In the end, if we can collect the proper data and effectively convey it transforms into higher service levels for the clients," Retailer G said of IoT study. "Real-time reporting and inventory management is the major driver for us to use IoT," said Retailer I.

Six retailers discussed in-house cross-functional data and results sharing: "IoT data is pretty much shared with all functional teams" [Retailer A]. Retailer D showed all management their smartphone app-based real-time analysis tool. Seven stores received analyses from their transporters: "They (transporters) always supply us with data on outcomes, their success rate and such" [Retailer L]. "We don't share data with our supply chain partners, we just share the outcome," said 10 merchants. Our info is confidential. 6 retailers mentioned sharing insights with suppliers: "The supplier is eager for that visibility in the planning process." "We provide insight to the supplier two years in advance" [Retailer G].

Proposition P4: The IoT adoption permits Big Data analytics, thus positively associated to extra data collection, analysis, and business intelligence extension.

4.6 Drivers for IoT in Retail SCM

"You have to have a fantastic SC because there is so much competition. That's where IoT comes in to play" [Retailer L]. Eight retailers cited faster Internet transmission speed and lower pricing as key reasons for IoT espousal in retail SCM: "The Internet is better, and the prices are continuously going down" Retailer E]. Eight respondents said, "Every person has gadgets supposed to be IoT devices now, therefore they expect to use them at work too" [Retailer J]. Smartphones are also significant H2M integrators in industry IoT: "Now a day everyone carries a smartphone, a sort of IoT device which is always connected to the Internet" [Retailer K]. Retailer D clarified their smartphone app informing staff operating facts. Many had consumers' apps. Retailer E said smartphone apps have transformed the restaurant business by connecting consumers and suppliers. "Most of them are young folks, so they adore these kinds of apps. I'm talking about consumers and workers, both" [Retailer E].

4.7 Business and IoT Adaptation

Firm-specific criteria also influenced IoT adaptation decisions. Nine retailers mentioned this. Multinational retailer C expected a cutting-edge rollout. Retailer G believed they were innovative as a global leader. "Relative to the cost of the consumer products, some of these IoT ideas are still rather pricey," said FMCG retailer I. Retailer L held their goods arriving in parts were the main obstacle. "Digital devices and smartphone apps are almost a need and a norm," Retailer E said, citing restaurant customers' expectations. "We are a small business without experience," Retailer L said. Retailers

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A, D, and L blamed their firms' infancy for IoT adoption. Retailer D's IoT deployment was influenced by its decreasing marketplace.

4.8 IoT implementation in SCM

Nine retailers cited efficiency as the main reason for using IoT: "Because it enables efficiency in terms of movement of goods in the SC" [Retailer A]. Productivity was cited by 6 participants as time saving and compact physical effort, 5 as output and quickness, 4 as process optimization, and 3 as cost minimization. "To acquire access to information and the visibility of information" [Retailer D] was a motive for six retailers. Real-time data capturing was mentioned by everyone. "Having real-time access to information," Retailer L commented. Three retailers discoursed getting detailed data for improved policymaking: "Having the necessary devices to record the data and utilise that data to deliver a better service is the primary incentive" [Retailer G]. Three cited precision: "Accuracy of data is definitely higher when a device is doing it for you" [Retailer H]. Three participants mentioned security and surveillance, buyer happiness, and the industry normal: "We wanted the capability of telling that gadget in real-time" [Retailer K]; "We are driven into these things because of the retail need" [Retailer A]. The following is suggested since the IoT drives Big Data analytics.

Proposition P5: efficiency, visibility, and precision are three enabling capabilities of the IoT that have a favorable effect on investment decisions.

4.9 Challenges for IoT Adoption in SCM

"The expense is certainly the very big issue," said Retailer L. "Any such investment is considered as a liability, rather than seeing it to strengthen the firm in the long term" [Retailer A], said three participants. Eight merchants expressed optimism about IoT implementation: "The cost is always an issue, but it will pretty much offset in approximately three years into operations" [Retailer E]; "Clearly the IoT technology is not a loss-making. It is profitable if you use it right" [Retailer J]. Retailers B and I suggested that upstream suppliers and manufacturers should not pay for RFID technology while downstream partners benefit more. "It is a space where retailers and brand owners need to spend jointly to impart changes," said Retailer I.

Internal leadership challenges followed. "If you don't perceive the advantage, you only see the expense. It is not the cost that is the major difficulty; it is the knowledge," [Retailer F] said. Six managers highlighted a lack of IoT adoption management vision: "I think there seems to be a certain level of the hesitation of investing in this (IoT) field. Decision-makers find the cost to service and operations a little bit too abstract" [Retailer A]. Four interviewees thought senior managers didn't comprehend SCM requirements. "Managers don't want to know up the value chain, it is easy to obfuscate what is occurring upstream," Retailer I said. Lack of strong examples from three shops worsened the challenges above: "We didn't require a solid example to follow when we transitioned.

We were sceptical about IoT investments "H-Retailer.

Technology was questioned last. Three participants mentioned Internet breakdown and coverage concerns. Retailer L also addressed the technicalities of "the integration capabilities of existing systems". Retailer A disagreed, saying "...there is a definite need for IoT deployment, yet at the same time the technology is changing so rapidly. There is a reluctance from senior management to invest in any type of technology. Because there is a risk that it would be regarded obsolete within another two years." This proposal categorises IoT adoption challenges:

Proposition P6: Social and technological issues make it difficult for IoT to spread into SC operations.

5. OPPORTUNITIES AND CHALLENGES

- Interviews show that SCM personnel use cellphones to integrate customers and multitask. By merging old electronic gazettes onto a smartphone, retailers can reduce e-waste.
- Retailers have used technology like IoT to improve operational efficiency as competition has lowered profit margins.
- Retailers are using IoT because to low-latency 4G networks and cheaper sensing devices.
- IoTs provide tremendous opportunities in retail and supply chains, but they face several obstacles to adoption. According to the interviews, IoT adoption is hindered by investment expense, management vision, and staff difficulties like reluctance to change and fear of new technologies. Most merchants said IoT implementation was a good investment. We think IoT benefits will convince sceptics to adopt and use it. Standardization, interoperability,
- Socio-technical hurdles include corporation data refusal to SC partners. Retailers don't share specific data with

SC partners, reducing IoT benefits. SC partner collaboration and integration can improve business sustainability by exchanging accurate and timely information (de Vass et al. 2020). To profit from IoT real-time data sharing, SC partners must cooperate.

- To maximise their potential, they need time to master new technology and grasp their operational benefits. Retailers must provide personnel with training and time to self-learn these technologies. This will assist merchants migrate to Industry 4.0, which imagines IoT at the centre of cyber-physical systems in supply chains.
- When technology advances and Internet connectivity improves (e.g., 5G network) (Taboada 2020), senior management will use the IoT platform despite the aforesaid problems and security and privacy concerns.

6. CONCLUSION

The study examined Indian merchants' IoT adoption experiences, including possibilities and difficulties. Twelve retail practitioners and one 3PL firm were interviewed loosely by the GT to evaluate issues. This qualitative study provides rare insight into SCM IoT adoption drivers, facilitators, benefits, problems, and hurdles. The SCM-Information systems study on emerging technologies in SCM offers observed comprehensions for scholars and practitioners on several features of IoT uptake and use. Retailer's readiness to utilize IoT is shown by early Industry 4.0 study.

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