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The Impact of Digital Disruption Technologies on Customer Preferences: The Case of Retail Commerce

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Abstract*: Consumer preferences which include likes, dislikes, motivations, dispositions are influenced by many factors. In association with needs, these preferences define a customer's behavior towards goods or services. In recent years, there has been a tremendous shift in customer behavior and the reason for the same can be attributed to the digital technologies. These technologies are compelling the businesses to rapidly change to remain relevant in the market. On the supply side, Social media, Mobility, Artificial Intelligence, Analytics or Big Data, Cloud infrastructure, IoT, Augmented reality and Virtual reality (AR/VR) are creating opportunities for existing enterprises to transform as well as new pure digital enterprises to be born. On the demand side, it's vital to understand the impact these technologies have on customer preferences for the appropriate marketing strategy to be developed. The same technologies are available to customers too in some form or other. This paper looks at the impact of the disruptive digital technologies on customer preferences and the resulting change in customer behaviour at two levels. It captures the results of the study on customer preferences towards online shopping. It also elaborates on the changes in the preferences with digital technologies. It clubs the customer preferences in three groups aligned with phases in purchase process. The paper also looks at the possible future evolution of technology and its impact on customer preferences. In this paper, intrinsic considerations are for the retail industry. Retail firms in this day and age have a golden opportunity to use technology to understand consumers in more meaningful ways.

***Index Terms*: customer preference, digital transformation, eCommerce, digital technologies.**

I. INTRODUCTION

"We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten." -Bill Gates

Information and Communication Technology (ICT), has become an important factor in economic growth and an enterprise's performance. Over a while, the ICT impact has moved from mere digitization of manual processes using computers to an enterprise being completely digital. This is not unusual as scholars have proposed models where new technologies lead to a long period of incremental innovation followed by a radical disruption by another technology. The disruption happens when products or services based upon new technology make the existing product or services obsolete. The impact of technology on the supply-side has been widely studies. The impact of technology on demand-side only lately started getting covered. One possible reason might have been the assumption that preferences are static i.e. do not change. As we move away from the industrial mindset to a more customer-centric mindset, it is important to understand how technology is changing customer preferences. It also becomes important to understand how customer preferences are driving innovation in smart technologies

II. REVIEW OF LITERATURE

OFT (2007) in their market study with respect to internet shopping saw that the internet has profoundly affected UK retailing, empowering businesses to sell and shoppers to purchase products from anyplace in the world whenever. Najdic (2011) assessed in detail the tourists' decision process with respect to their vacation goal. Exact Research was attempted that joined the ideas; goal loyalty and psychology of the consumers in tourism, to discover the relationships between them. Results of this examination helped in upgrading the effectiveness and efficiency of management in tourism sector by concentrating on perceptions and motivations that give better understanding on consumers' point of view. . Bajs (2011) propounded that perception of value is governed by apparent quality and costs as well as by the product and administration attributes. And, from among an entire arrangement of various attributes, customer assesses just a couple of them. Kim, Park and Schwarz (2010) attempted a research on how the consumer assesses the product by means of thinking about their emotions. It is so on the grounds that for the most part the decisions depend on decadent expectations – will it be beneficial for me to do this? As expressed by Fishbein and Ajzen (2015), investigation of attitude towards online shopping is critical to understand the attributes of an online consumer. Lexhagen (2015) clarified explanations behind the online tourism industry's market slower than anticipated growth rate. The research work is oriented towards the consumer's perception about value added services in their buy process.

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Researcher chose 18 factors identified with contact, search engine, multimedia, joins, community, map, FAQ, Languages, Booking, and so forth. The theoretical model created included three stages: I-Search and Evaluation, II-Purchase and III-Post Consumption. Customers saw that most value added services ought to be a piece of Phase I and II and least preference was given to stage III.

III. NEED AND IMPORTANCE OF THE STUDY

Ecommerce have created new, more effective, efficient and customer centric platforms for exchange of goods and services. There are more than 627 million internet users in India. If online retailers can deliver consistent quality, complete range of products, competitive pricing, on-time deliveries, reasonable return policies, and good customer service (last minute change of order, cancellations, payment options), then this segment is bound to grow rapidly. The huge potential of the market and its early stage of growth necessitates a study of customer preferences, to ensure that the marketing objectives of the eCommerce enterprises are well placed.

Another needs comes out of the reality that the disruptive technology changes with continue to happen in future, which will continue to alter customer's needs, wants and decision making process.

The Research Questions raised are:

1. What are current customer preferences towards eCommerce? This understanding will help ensure that eCommerce business is aligned with customer's wants and expectations, grows rapidly and becomes profitable
2. How will the customer preferences change with their exposure to newer disruptive technologies? This will help ensure that the eCommerce business is ready for tomorrow and able to sustain and grow with the change in the customer preferences

IV. METHODOLOGY

Leveraging the previous studies conducted and researchers own thoughts, research variables were identified and a questionnaire prepared to collect data. In previous studies numerous variables were considered but this study groups preference variables under three broad dimensions, in relation to the stages in the buying process. The questionnaire has two main sections, demographic information and the Ecommerce sales process related section which includes Product/Service feature related preferences, purchase process-related preferences, and after-sales Service related preferences.

Type of Research: The study is descriptive study based on sample survey cum interview schedule among the grocery customers in Bangalore.

Study area and population: The study area consists of Bangalore metropolis and the respondent population is the urban customers who are mobile and internet users.

Sampling Technique: Multi Stage Sampling Technique has been used in this study. In the first stage the Regions in Bangalore were selected using Simple Random Sampling. In the second stage neighborhoods within the Regions were selected based upon Simple Random Sampling. In the third stage residential layouts were selected within the neighborhoods using Simple Random Sampling. In all of these selections Lottery method was applied. In the fourth stage the respondents had been selected using Convenience Sampling.

Sample size: The total Sample size was 271.

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DATA COLLECTION

Primary data: A well-structured questionnaire cum interview was prepared for the primary data collection and it was administered to 50 respondents in the pilot study. After suitable enhancements the final questionnaire was used for collecting data from selected sample respondents. The questionnaire cum interview schedule method was used for collecting data from the respondents.

Secondary data: Secondary data was collected from publications on industry bodies, previous research studies, journals, magazines, analyst reports, journals, magazines, textbook, websites and dissertations.

Data Analysis: Through R Studio, Descriptive analysis, Factor analysis, Chi-Square Test, Average Score Analysis, Garret Raking, tools got used for data analysis.

V. TECHNOLOGY EVOLUTION FRAMEWORK

Digital technologies are a branch of science or engineering that deals with the creation and practical use of digital or computerized devices, methods, systems, etc. Using mathematical compression algorithms huge a large amount of data can be stored on a small device. The digitization of information also enables extremely fast and high fidelity transmission.

The digital revolution has been happening for quite some time. To structurally understand this digital revolution, the computing platform model floated by International Data Corporation (IDC) may be used. A computing platform tried to bundle technologies together.

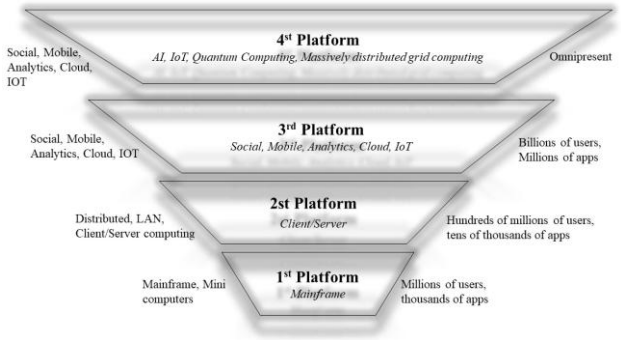

Fig 1: Diagrammatic view of digital Technology evolution grouped as platforms (Reference: IDC

The first platform in the late 1950s consisted of Mainframe computers. It continues even today. It marked the beginning of computerization of manual tasks. A new breed of millions of users and thousands of new applications came up.

The second platform came with the advent of PCs into the main market in the mid-1980s. The client/server became the primary computer application architecture. The user community tremendously increased to hundreds of millions and tens of thousands of application came up.

The thirst platform, which is causing the digital disruption today, includes technologies such as Social media, Mobile computing, Cloud computing, information Analytics (big data) and IoT. These technologies started coming to market in the early 2010s and have become quite ubiquitous now. Analyst firm Gartner says that the interdependence between these technologies and their use was "transforming the way people and businesses relate to technology". These technologies have billions of users and millions of applications.

The forth platform is yet to be defined. It's a look into the future and hence important from our endeavor to understand the possible evolution of customer preferences in the future. The fourth platform will possibly include Artificial Intelligence, IoT, Quantum Computing and massively distributed Grid Computing.

VI. THE RETAIL DISRUPTION

On the sell side two critical disruptions that third platform technologies have brought are:

1. Location and its attributes such as vicinity and upkeep have lost their critical value due as eCommerce makes it virtual.
2. Entry barrier, the competitive tactics of big established retailers is demolished. eCommerce has created a global marketplace allowing anyone to buy from anywhere or anyone, any size firm to sell from anywhere to anyone

On the buy-side, the rapid increase in internet and the smartphone user base is dramatically increasing the eCommerce market. The digital transformation happening in India today is expected to increase the total internet user base from 560.01 million in September 2018 to 829 million by 2021.The perks and attractiveness of eCommerce, especially in the retail market place, have led to its rapid growth. Among all global economies, India has the fastest growing online retail market scoring a Compounded Annual Growth (CAGR) of 53% from 2013 to 2017, as per a report by Bain & Company. The future looks even more exciting. As per a report by industry body NASSCOM and PwC, the Indian ECommerce market estimated to be about USD 35B in mid-2018 will grow three times its size and surpass USD 100B by 2022. Online retail and e-travel grab a pretty big slice, while online financial services are expected to grab an even bigger slice of the ECommerce pie in the coming years.

VII. FRAMEWORK GROUPING CUSTOMER PREFERENCES IN THE SALES LIFECYCLE

Customer preference may be defined as the reasons that the customers use to make choices when they are selecting a product or service. This includes likes, dislikes, expectations, priorities, morals, values, motivations, and inclinations. These preferences in association with needs define customer behavior.

The customer preferences influence the decision during the shopping and thereafter too. The customer preferences get exhibited for the product/service features, for the process of purchase and also for the after-sales service, as depicted in diagram and detailed below:

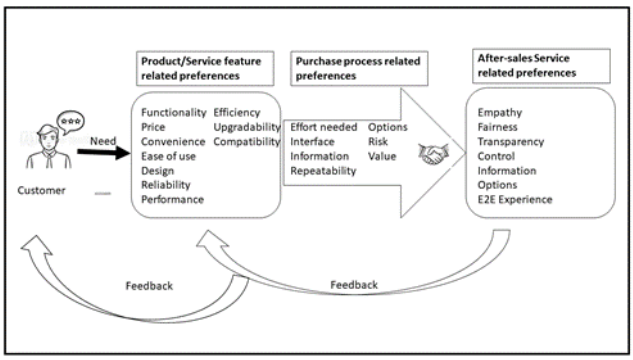

Fig 2: Grouping of Customer Preferences as per the sales lifecycle

1. **Product/Service feature related preferences**: The product or service bought by the customer is for a specific need(s). The product/service must have the **Functionality** to satisfy the need. It must come within the budget of the customer, hence the **price** is important. It must solve the need in an effective and **convenient** way. It must be **easy to use** the product/ service. The **design** should make it easy and intuitive to use. The product/service should be **reliable** and meet the **performance** expectations. It must save time, effort and cost thus be **efficient**. It should be easy to **upgrade**, repair and should be compatible with its surrounding systems/services. The **sensory needs** i.e. color, look, taste, smell, touch, the sound should align with the customer's preferences.

2. **Purchase process-related preferences**: Any Customer would prefer to do the purchase transaction easily and conveniently. The **effort** put in should have the expected satisfaction. Different customers will like different ways or **interfaces** to do the business.

Some customers may want detailed **information** while some may want it brief, sorted and simplistically presented. Some may prefer to **repeat** the product/service purchase while some may prefer to explore the new **options** every time. Different customers may have different **risk** preferences impacting their purchase decision. The product/service should align with their **value** system.

3. **After-sales Service related preferences**: When a customer gets in touch with the after-sales service team they expect **empathy** and understanding from them. They expect **fairness** in pricing and information during the service/contract period. One simple way to create a feeling of fairness is to have **transparency** and openness.

No one likes to be held captive, thus the customer would prefer to have a feeling of being in **control** and be the one who is making the decisions. This would mean having multiple **options** to choose from. Making choice will need **information**, hence it important for an enterprise to provide information in easy-to-use way. The customers will like to have easy **access** to support people. Finally, all customers will prefer to have good **end-to-end experience**.

VIII. FINDINGS AND DISCUSSION

DIGITAL THIRD PLATFORM TECHNOLOGIES AND CUSTOMER PREFERENCES

Technology evolution till the late 90s, the "dot com" era or the 2nd platform technologies, had a unique aspect. They brought new things to people and delighted them. Customers were happy to use whatever the technology-enabled. This has changed in the era of the third platform. Today thanks to social connectivity, the customer expectations and wants are dictating the use cases for the technology implementation. Social technology today, enables limitless experience sharing and thus eliminates economic, geographic, demographic and all other boundaries. Preferences are often shaped by one's own experiences and also by the experiences of others. Social technologies enable this experience sharing coupled with analytics. This experience sharing and analytical representation of these experiences from a large group, towards a product/service do impact one's preference towards it.

A. IMPACT ON THE PRODUCT/SERVICE FEATURE RELATED PREFERENCES

The industrial mindset dictated the features and **functionalities** for most products/services for a long time. It has changed. Customers are telling what they want and producers are catering to it. There is a move to provide customizable product/service functionality wherein the customer can change it to their preferences e.g. most electronics devices have moved from hardware only interface to highly user-customizable software interface.

There is an expectation that the **prices** should go down. The current digital technologies have reduced the need for capital expenditure to procure devices and systems and enabled their conversion to operational expenditure by enabling "as a Service". e.g. Storage, products and computing power on the cloud is available "as a service" (SaaS, PaaS). The cost of communication has come down. The voice over IP (VoIP) call, even across continents, are almost free but for the data charges. While for the new and innovative products/services customers are willing to pay a premium (e.g. iPhone, health monitors) they prefer the price for business-as-usual products/services to reduce continuously. If the constraints of technology are preventing a reduction in price, there is an expectation to innovate, use new technologies and come up with replacement products.

Convenience has become even more paramount. The need or want must get satisfied most conveniently. This preference for "most" convenience will drive continuous innovation. Placing an order over a phone call is getting replaced by online ordering. Going to the store is getting replaced by at-home delivery.

Many devices and services needed expertise to use. The **design** focus on better user interface and user experience has led to the design of new systems that are intuitive and **easy to use**. A few examples would be payment services where you "scan and pay", Biometric authentication, gesture control of devices including mobiles, voice command controlled / interactive devices, smart TV, etc. Customer prefers minimal input from them to get the desired response from the system/service. The customers also do not want to be restricted by the channels of sales and would prefer a truly **Omni-channel** experience.

With many choices and more coming up, the tolerance towards **reliability** and **performance** deviations is almost zero. Customers expect the product/service to work perfectly the first time and every time thereafter. Any failure will lead to a competing product/service being selected. The customers have also become very vocal and do not hesitate in sharing their bitter experience, impacting the behavior of future buyers. The customers also expect the services to be **available** all the time. The downtime concept, especially for services, has become redundant now.

Any product or service offered is expected by customers to save time, effort and thus to be **efficient**. Online transactions that are real-time and can be done from anywhere are an example of this expectation and preference.

Customers know that technology will keep evolving. They expect their product and service to be easily **upgradeable** to newer technology versions/changes. Most products/ services work in an interconnected world today where they leverage the features/capabilities of others. Customers expect that the system/service they have availed will continue to be **compatible** and thus work seamlessly with the interconnected systems in the future.

When all these preferences are satisfactorily catered to then the **sensory** preferences come into the play. The digital technologies are trying to cater to it more and more. The remote-controlled LED light bulb that can produce millions of colors for a room is an example. Cars today have sensory preferences at the core with customizable mood light, Wi-Fi music, soft-touch fabric dashboard and seats. Hotels are taking care of the differences between male and female preferences and needs and designing rooms/wings to cater to it. They have put the power of choosing the room to one's preference in the guest's hand allowing app-based remote check-in.

B. Impact on the Purchase Process related preferences

The digital technology has disrupted the traditional buying process. Let grocery shopping be an example. Shopping for monthly grocery at a superstore basically translates into the following: travel to the superstore, exhausting physical search for the wanted products, disappointing unavailability of specific products due to limited stocks, manually trolleying your shopping around from aisle to aisle, long checkout lines, old-school payment methods, trolley the shopping back to your vehicle and then travel back to home.

The alternate option of going to the neighborhood store eliminates the potential variety and ease of shopping. The online grocery stores provide a better option to customers, by providing access to quality products, with a large variety of chose from, without the wastage of time and energy.

eCommerce has brought in an **easy** and **convenient** way to do shopping, as evident from the grocery example above. The **effort** that the customer was putting has significantly come down. The technology allows the customer to put in the effort that allows maximum **satisfaction** to him by letting him order from home and get it delivered at home or order online and go to store and pick up or go to a store, pick-choose and do self-checkout. It's all up to the customer's choice.

These technologies today facilitate many possible **interfaces** to do the business. Simple intuitive interfaces that can be used by anyone are coupled with simple mechanisms to get more product/service information should one want. Thus the preferences of both simplistic as well as detail-oriented customers are taken care of. True Omni-channel is made available to the customer. Often the information is organized in a layered form so that one may choose the level to which one wants to deep dive.

The technology permits easy storage and retrieval of the customer's past purchase choices. This makes **reordering** very simple and intuitive. Often, using pattern analysis, marketers provide extra stimulus in the form of incentives or discounts. The customers prefer to have access to their history and also be suggested aligned new offerings, in a way that's in his control.

The **risk** appetite of the customers is much more effectively handled by new technologies. The "as a service" offerings have eliminated the need to buy and store systems or products at home. Preference is to avail the services from cloud-based systems. The availability of the service is assumed to be guaranteed. Systems have become self-diagnosing. They track their health and intimate the service centers of necessary preventive needs by themselves. E.g. smart water purifier, connected cars. Such use of the technology when abundantly used will reduce the Strategic, Compliance, Operational, Financial and Reputational Risks. Thus these technologies have reduced the risk appetite of customers.

Value is very intrinsic to the customer. The customer will buy what aligns with his value system. Analytics and Big Data allow an analysis of the customer which enables among other things, identification of value, beyond the general value trends e.g. "go green". The awareness of alternatives has driven the customers to be more particular with their values.

C. Impact on after-sales Service related preferences

A report from by Bain and Co and Facebook, that looked at the impact of digital technologies in the automotive industry, says that the digital engineering, 3D printing, smart sensors and the Internet of Things (IoT), are poised to disrupt auto research and development, manufacturing, sales, marketing, and after-sales services. By the turn of the decade, sale of seven out of 10 vehicles in India will be digitally influenced, The aggregate value of such sales will rise to $40 billion from the current $18 billion, says the report " Changing Gears 2020: How digital is transforming the face of the automotive industry". It further says that social media will influence about 40% of sales valued at $23 billion by 2020, up from 20% today. A large number of companies are finding their service businesses to be under challenge. The service business of incumbents is under attack by new digital upstarts who leverage the changes in technology, customer behavior, and data to create innovative, customer-friendly alternatives to the services incumbents offer. The digital disruptions that started in retailing with the likes of Amazon, two decades ago, are fast coming to every industry.

According to a report published by the Institute of Customer Service, consumers today face significantly fewer problems when buying goods and services than they did five years ago, but they are more inclined to complain when things go wrong.

When a customer gets in touch with the after-sales service team they expect **empathy** and understanding from them. After-sales service, instead of just being a transaction, customers prefer it to be a managed journey. They expect the service advisor to be their advocate within their organization, and also to provide proactive advice to them. They also want to belong to service communities, a group of people who avail the same service(s). Service provider have started creating and nurturing such communities.

The **fairness** and **transparency** expectations manifest as the want to have **consistency** in **information**, and also open availability of the information. The "only for you" deals over phone and email is passé. Instead of stale website customers prefer to discuss and discover the service attributes on social forums. They expect engaging and connected experience from the service provider application, instead of static web pages. They want engaging applications with touch and voice interaction-based **accessibility** as compared to a desktop and static webpage based one. Follow ups by provider till the aftersales needs are satisfactorily addressed are expected for a good **end-to-end** experience.

IX. FUTURE SCOPE: FOURTH PLATFORM TECHNOLOGIES AND CUSTOMER PREFERENCE

An AT Kearney Global Future Consumer Study has shown a dramatic increase in consumers who want authenticity, truth, and transparency from brands and large corporations. It says "The mass market of the future will thrive on three principles: trust, influence, and personalization."

In tomorrow's world of "frictionless commerce" the digital technologies will integrate the product purchase seamlessly into consumer's daily life. The purchases will be automatically initiated on behalf of the consumer with his prior consent, using real-time, integrated data from smart devices from his known preferences, past behavior, sensors, and other smart sources. A realistic example which is already is trial will be a "smart fridge" that automatically orders food items which it senses to be running low. As the consumers become connected to everything, at all times, the main point of commerce will be the consumer himself and not any specific channel.

Companies will have to accurately perceive and seamlessly deliver what each consumer wants with unprecedented precision as the customer becomes the main point of commerce. The customer preferences related to the product/service, the buying processes and after-sales service will become even more impacting.

Customer service shall become the focal point to develop customer loyalty. The adoption of future technologies will lead to customers moving from being affluent where material ownership defines the status to influencers, where what one does defines one's status[AT Kearney]. In this environment, customer experiences, good or bad, will be reaching millions of customers within minutes. To create lasting relationships customer service, and the very front end layer, would have to know and act per individual customer's preferences. Organizations will have to understand the entire customer journey. Building unified and pro-active cross-channel services will deliver differentiated customer experiences that drive loyalty and repeat sales.

The IoT or Connected devices will enable self-diagnostics and remote monitoring of products. This will help in analyzing device data to predict failures and take corrective action proactively. Advanced analytical techniques can be leveraged to deliver better services and improve efficiency

In summary, the Product/Service related references of each customer will have to be understood and individually catered to. The frictionless commerce of autonomous commerce entities will need this data as input to be work. Algorithms will replace some consumer emotions as the prime force shaping purchase decisions. Consumers may forego their customary brand choices in exchange for the speed and convenience of whatever is offered by digitally empowered parties. Even in this environment, an effective mix will be to cater to customer preferences and only in case of unmanageable limitations push alternate choices.

X. CONCLUSIONS AND IMPLICATIONS

Each consumer has a set of preferences and values. These preferences dependents upon culture, education, and individual tastes, among a plethora of other factors. These preferences guide all the stages of the decision making process i.e. 1) situation definition 2) alternatives generation 3) information gathering 4) selection and 5) action. These customer preferences were clubbed into three groups

1. Product/Service feature related preferences that impact the first four stages of decision making.
2. Purchase process-related preferences which impact to the firth or action stage of decision making
3. After-sale-service related preferences which influence all the five-stage.

In this study, it's found that respondents are using the eCommerce but are not completely dependent on it for all of their and every time of their shopping needs. It also shows that

1. The demographic factors affect the online shopping.
2. The perceived quality of the products affects the online shopping especially grocery.
3. The ease of return and quick replacement and the on-time delivery affect the online shopping.
4. The lack of specifications for farm produce, hence the reliance on sample images affect the online grocery shopping.
5. The ease of use of sellers website and mobile App, affects the online shopping.

This study found that demographic factors impact the online shopping. An example would be married, unemployed homemakers miss the joy of in store shopping when they use the online mode, whereas working professionals who lack the time to shop in physical stores welcome online shopping. Customers also give importance to easy returns and replacement policy, quick, on time delivery, clear information on manufacturing and expiry dates. Satisfactory after sales service increases the chances of repeat business.

The seller should consider these customer preferences and implements strategies not only to cater to these preferences, but also to plan for the changes that will come in these preferences as newer technologies become available to both customers and them. This will be the way to ensure profitability and sustainability of business.

Technology is a powerful tool in influencing customer preferences and changing their behavior. In the past, with an industrial mindset, producers pushed standard products and customers bought it having no better options. In the industrial mindset, the average buyer preference was catered to, at best. The digital technologies of the third platform have changed it. Customer is pickier and buys products/services exactly meeting their individual preferences. The customer is becoming non-compromising with his/her preferences. It has become imperative for the business to cater to individual customers' preferences. The technology today and its evolution facilitate customer preference centric commerce. Catering to the individual customer's preferences would be a critical survival factor for the enterprises.

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Arun Kumar Singh, Research Scholar, Senior Vice President & Business

Arun Kumar Singh is a global IT industry veteran. As an ardent learner, he is also a part-time research scholar at Periyar Institute of Management Studies, Periyar University, Salem, India.

He is an entrepreneur by heart and a strategist in action, with about three decades of success in building and leading large teams and business units, driving benchmarks setting growth and expansion for global and globally focused Top Indian IT firms. Arun has remarkable expertise in engaging clients in a consultative communication, reinforcing his role as an industry thought leader.

Arun as a strategic business unit head is responsible for building, growing and leading the Business across UK, Continental Europe, Middle East and India/Asia pacific region for Quinnox Consulting Services. As Global Delivery head earlier, he successful planned and implemented many people capability enhancement initiatives, delivery excellence initiatives and developed a completely client centricity based organization. For his leading work, he was conferred **"100 HR Super Achievers in India"** award at world HRD congress-2018**.**

He brings unique combination of R&D, Service Delivery and Executive Leadership experience across multiple industries like telecommunications, financial services, Retail and Manufacturing.

Arun joined Quinnox from **Capgemini** where he was the Vice President and Right Shore Head for the Testing Global Services Line. Arun was with **Wipro** Technologies for over 14 years in various leadership positions, before joining Capgemini. As Vice President and joint-head of testing services business unit at Wipro, he was responsible for leading the Services line with a team of more than 10,000 professionals. It was under his leadership that the BFSI and Enterprise QA groups grew significantly and contributed to Wipro Testing Services being recognized as the **largest third party offshore testing service provider globally** by 3 different analyst firms (2010-11).

During his engineering college days, Arun, developed a strong passion for research and development (R&D). This passion saw the young engineer passionately working on R&D projects for over 10 years at **AT&T** in USA, **C-DoT** and **DCM Data products**.

Arun believe that there is no end to learning. He did his BE (Honors) from REC Tiruchirappalli. Later he did his Masters in Marketing Management. He is currently pursuing his PhD. At Wipro he did the General Management Program (IIM Bangalore- 2002) and Harvard Executive Management course as part of Capgemini (Harvard – 2014). He is a regular speaker at many universities and industry forums. Arun has published about 4 research papers in international journals. His articles are often found in CIO Review – India magazine.

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Dr.P.Thirumoorthi, presently working as Associate Professor in Periyar Institute of Management Studies, Periyar University, Salem is qualified with BE, MBA and Ph.D. In addition to that he is also qualified with SET. Prior to his academic assignments he worked with industries for 4 years. He is specialized in Operations Management and Technology Management. He also engages research in Supply Chain and Systems Management. He teaches Quantitative Techniques and Research Methodology. He has Published 4 books related to Management and 1 edited volume book. He also published more than 50 articles in refereed journals. He organized many National and International level conferences and Seminars. He has made more than 40 presentations in Conferences, Seminars and Workshops.

He is being engaged with research in Technology Management area and received more than Rs.10 lakes research assistance from various funding agencies like UGC, ICSSR and IIPA. 10 candidates have been awarded Ph.D and 6 candidates are doing Ph.D under his guidance. He has also guided more than 25 M.Phil scholars in different research topics. He is the member of Board of Studies (MBA & BBA) in different Universities and Colleges. He is also the panel of examiners for various Universities. Dr.Thirumoorthi has made foreign visits to Malaysia, Singapore and Srilanka for academic related works. He served at various administrative works as additional charges.