

Technological Innovations in E-Commerce

Dr. Ajay Kumar

Associate Professor, Department of Commerce, Faculty of Commerce and Management Government P.G.
College Dharamshala, District Kangra, Himachal Pradesh, India.

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ABSTRACT:

With the advent of the Digital Age, new technologies of e-commerce might be successfully employed to increase citizens' access to public information, to support interaction with public departments, and to enhance local, regional, national, and supranational governments' responsiveness to citizens' current needs and future expectations. The paper explores e-government from an e-commerce perspective and examines various aspects of techniques, methods and tools ranging from business process reengineering to knowledge management to agent technology, which can support efforts of modernizing government.

Key Words: digital, responsiveness, reengineering.

Our activity of buying and selling goods online became a usual part of daily life. However, what does the future of the e-commerce industry hold? Ever since the development of the Internet, the role of technology in the online retail industry has been immense. This article highlights e-commerce trends in 2018 and the most notable technological innovations modifying the future of the online shopping experience:

- Chatbots - new virtual support service
- Voice Assistants - modified word of mouth
- Augmented & Virtual Reality - innovative shopping experience
- Blockchain Technology - new data security & payment method
- Drones & Droids - next-level delivery system

What is E-commerce Nowadays?

To define: E-commerce is a transactional process where parties exchange (buy & sell) goods

and services or send information with the help of an electronic network, the Internet. It is responsible for the sales aspect of e-business. As well, according to the commercial profile, there are 6 types of electronic commerce. Logically, this covers Business-to-Consumer (B2C) operations, but it is also involved in:

- Business-to-Business
- Consumer-to-Consumer
- Consumer-to-Business
- Business-to-Administration
- Consumer-to-Administration

At a high level, electronic commerce is based on technologies engaged in mobile commerce, online transaction processing, electronic data interchange (EDI), inventory and supply management systems, automated data collection systems, and digital marketing. It can also be accompanied by wider technologies for mobile devices, social media, and email tools.

Amazon and eBay were the first marketplaces to use the benefits of e-commerce to buy and sell mass market goods online.

Imagine - this year Amazon turns 25 years old! During this period, consumer interest and participation in online shopping has risen significantly. It is no wonder that over a quarter of the world's population (2.14 billion) will become digital buyers by 2021.

Currently, e-commerce vs brick and mortar statistics state the dominance of the latter. On the other hand, the e-commerce industry continues to grow on an annual basis, with 11.9% of total sales in 2018.

Thus, it is just a matter of time until most of our purchases are made online.



Global E-commerce Market Size 2015-2021

What are the Current Trends and Technologies Having an Impact on E-commerce?

Nowadays, customers hold the power in the market, as they have a vast number of offers to pick from.

Thus, it is not solely your product that allows you to stand out from competitors; it is a customer-centric shopping experience built around your brand to keep customers. Everything from an intuitive order process and payment possibilities to fast delivery has an impact. This augmented service is intangible and requires a lot of effort. It is here that new e-commerce technologies and applications offer solutions.

Today, all well-known brands are represented online by an e-commerce store, shopping apps, marketplaces or even all of these things simultaneously. Every effort is made to acquire

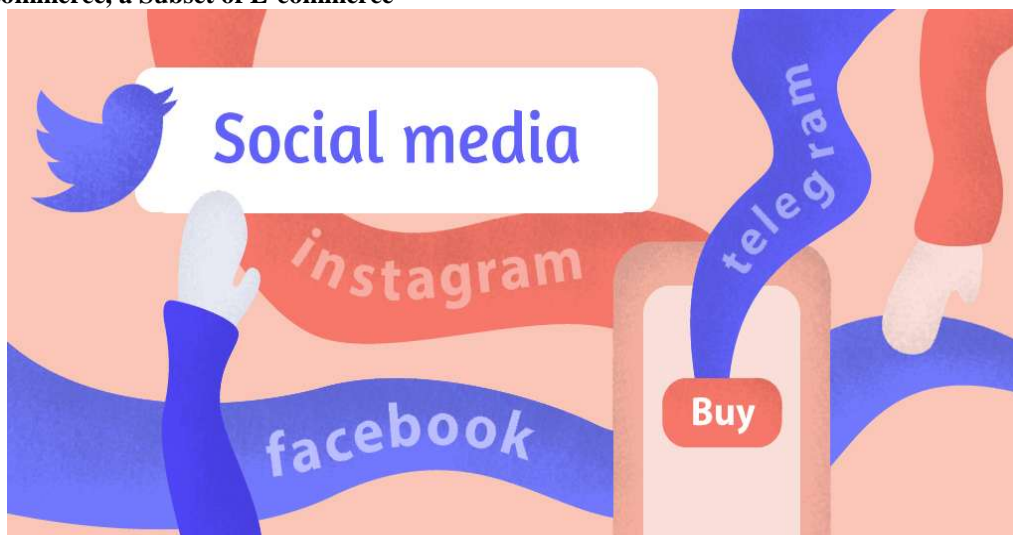
more clients online. Here are the trends currently shaping the e-commerce industry.

Personalized Product Recommendations

Recognizing your visitors and making personalized product recommendations will create a unique shopping experience and make an impression with your potential customers. Let's take segmentary as an example. It is an intelligent product recommendation engine that promises its customers at least 10% revenue increase. Through various implementations of different campaigns you can increase conversion rates, revenue, repeat customers and purchases, reduce bounce rates and abandoned carts.

When making product recommendations, it is important that you continue to analyze your performance and adapt based on the behavior of your customers.

Social-commerce, a Subset of E-commerce



Social Media Commerce

Naturally, social commerce is the use of social networks for online shopping transactions.

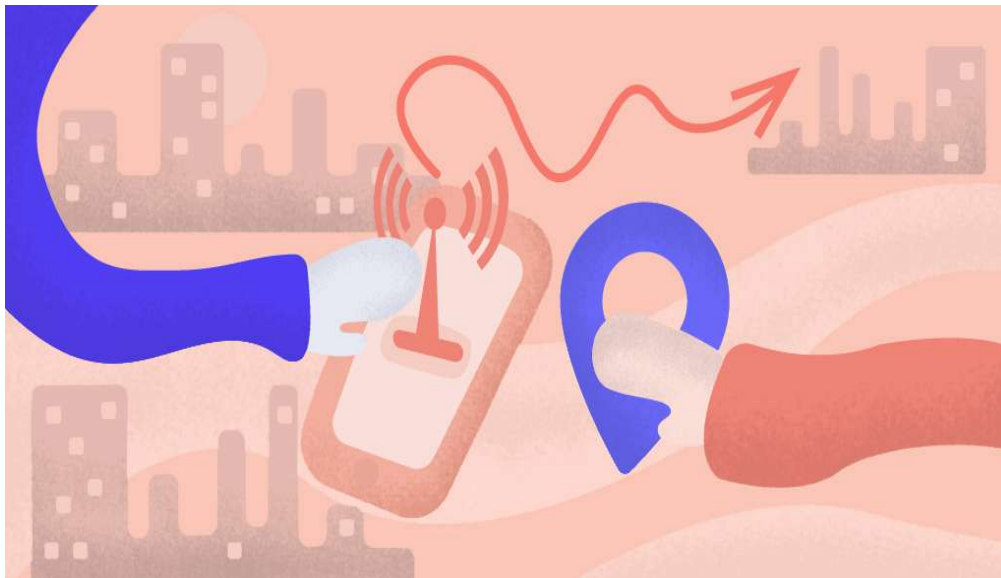
Social media is embedded in our daily activities. This fact effectively changes the buyer-seller landscape. Brands stay in touch with their clients via popular social networks to create a personal relationship. More advanced technical features are integrated into social media that are directed to shorten the buying cycle. In the future,

the one-click “Buy” button will likely be adopted by most social networks.

The combination of e-retail and social media has resulted in evolving P2P marketplaces. Facebook and Instagram are the greatest examples.

At last, the fact: the social e-commerce growth rate is on track to increase by 25% over the next 5 years, to make up more than a quarter of the total e-commerce market.

M-commerce



Mobile Commerce

Using applications on smartphones and tablets to buy and sell products is known as mobile-commerce or, more simply, m-commerce. Today, the percentage of consumers using mobile devices constitutes a half of all internet traffic, meaning it is of high importance that e-commerce shops adapt to mobile screens and, in some cases, even build a separate app for the specific purpose of reaching these buyers and following mobile e-commerce trends.

Solely the presence of a website or mobile app does not guarantee tremendous success. It is important to make sure that you create the best online shopping experience. Client engagement and retention are key indicators to focus on.

Mobile shoppers are particular, so even the slightest issue can change their mind and lead them to buy from a competitor. Meanwhile, the more advanced functionality embedded into mobile apps sets up some new game rules. The invention of the devices such as Beacons and Dash Buttons actually showed the value of having a branded e-commerce mobile app. These gadgets trigger

interest and engagement on the mobile app, which in the end increases sales.

One-Click Checkouts

This technique offers a completely new e-commerce experience formed from an analysis of former purchases and buyer behavior. Research shows that mobile users expect to have as easy of an e-commerce shopping cart process as possible. This advancement in the mobile cart, along with a growing interest in digital coupons, will be responsible for almost half of sales in e-retail.

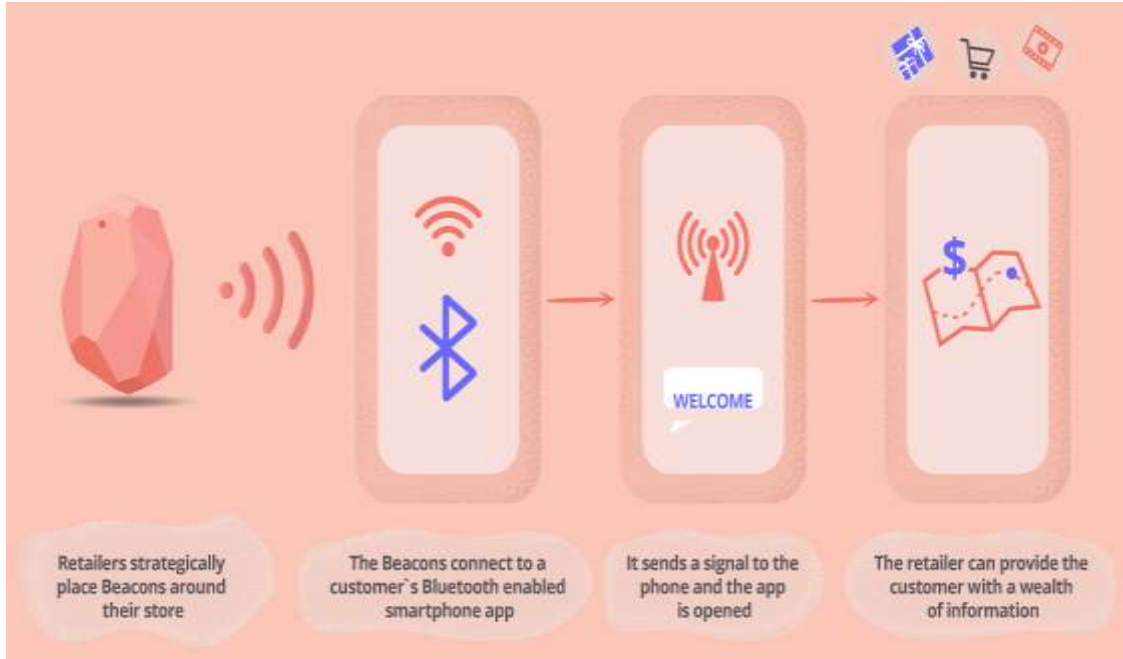
E-wallets and New Payment Integrations

Electronic wallets simplify the payment process. Online services like Apple Pay, PayPal, Stripe, and Google Wallet allow for easy electronic transactions. Moreover, digital wallets can be synchronized with your bank account. This data, along with your driver ID, health card, etc, can be stored in the phone.

As well, with the universal acceptance of NFC (near field communication) technology, we

wirelessly connect to terminals for in-store payments using our smartphones.

Beacons



Work of Beacons

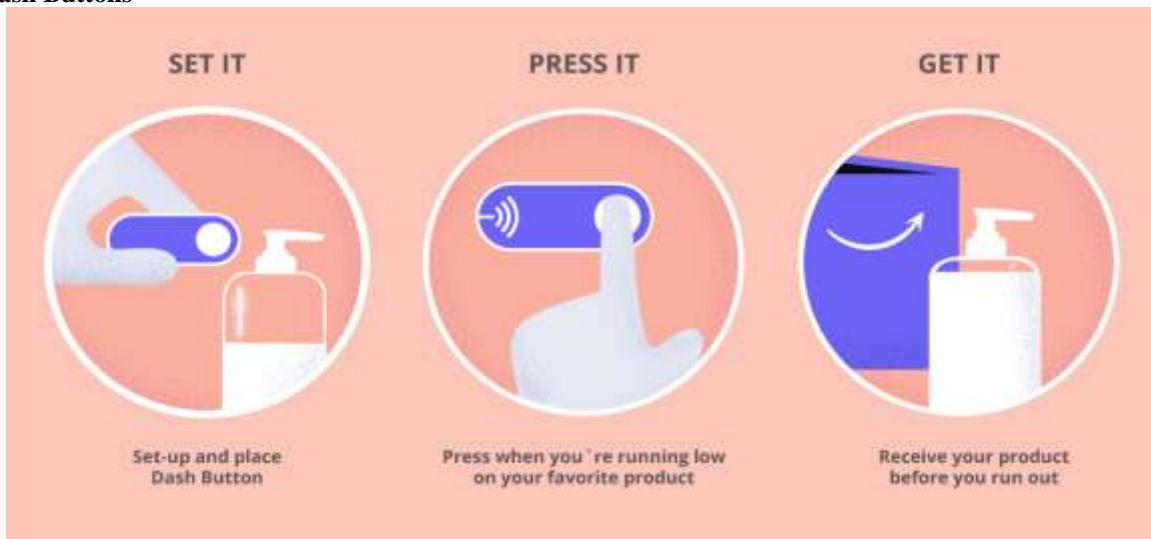
Beacons drive retail sales while, at the same time, providing a personalized mobile shopping experience.

According to a presentation by Apple in 2013, beacons are heavily used by top retail stores. Urban Outfitters, Macy's, Target, and CVS all use them to build personalized content strategies. The device

transmits Bluetooth signals to nearby smartphones that have the correct branded app.

This increases the chances to use the app more often and actually complete the purchase. Sephora utilizes beacons to gather consumer information and send personalized promotions.

Dash Buttons

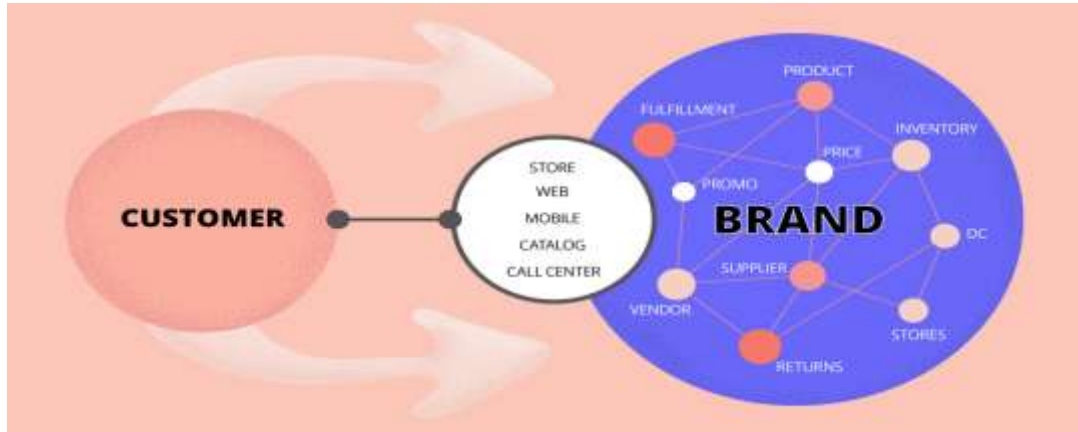


Work of Dash Buttons

This appliance from Amazon offers easy order-placement of the most regularly purchased goods. These button devices are tagged to a place where these goods are often used. Then, using the

Amazon app, a user can preliminarily set up the orders. This new technology trend in e-commerce will likely soon be imitated by other top players like Costco and Walmart.

Omni-Channel is the New Normal



Omni-Channel

According to Google, around 85% percent of users begin their shopping journey on one device and continue on another. It can start with an Instagram advert and end up at a leather jacket store down the street. This message from consumers has set the trend of aligning online and offline sales channels.

This approach is called omni-channel, meaning all the means of interaction with a customer should provide the feeling of one entity. Each detail of a particular company, its brand, marketing content, and ads should communicate the same concept.

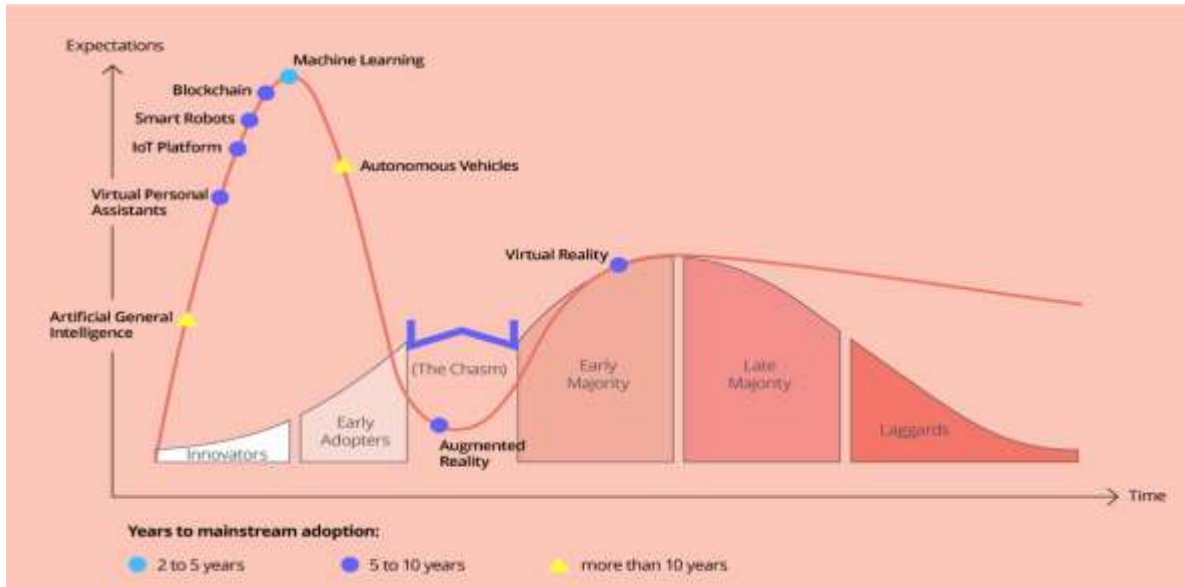
In order to stay competitive, enterprises will need to employ an omni-channel strategy. This

complex system implies a high-load backend to maintain and merge data from all the sales and social channels.

What is the Future of E-commerce?

These are the trendsetting processes at the present time. However, merchants should understand that as technology progresses, there will continue to be transformations in how we interact with and buy goods.

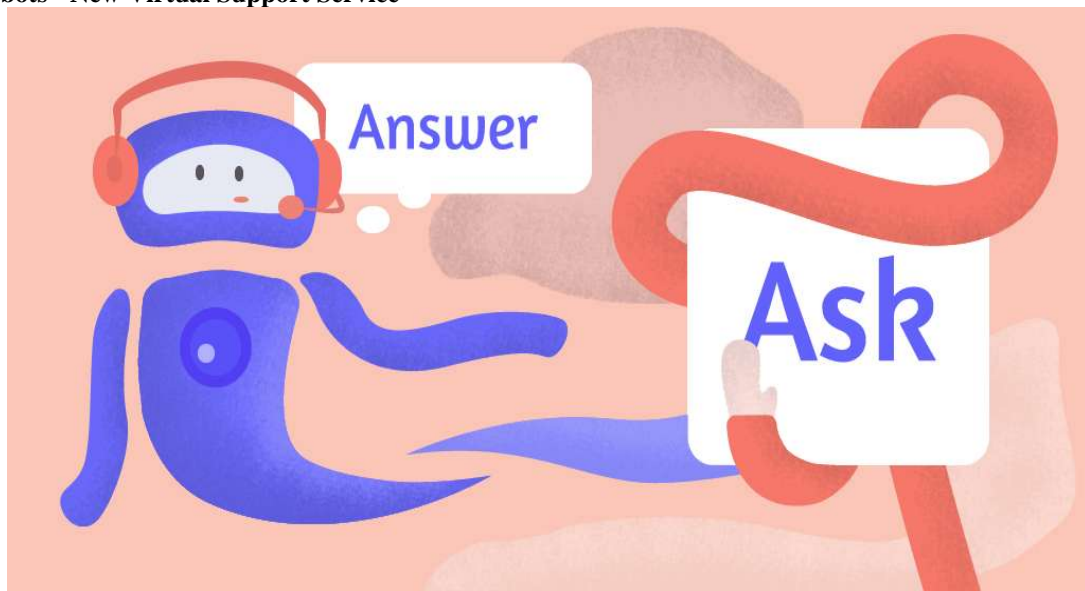
The tech adoption curve helps to evaluate the risks of employing new technologies used in e-commerce. It illustrates the most prominent e-commerce innovations influencing the industry and their level of acceptance by the public.



Tech Innovation Adoption Lifecycle

Naturally, it takes some time before being adopted by the majority in the e-commerce system, but keeping an eye on the technological advancements is more than necessary.

Chatbots - New Virtual Support Service



Chatbots

A chatbot (known as a conversational agent), is software technology that imitates real human interaction in a written or spoken way. It can be represented as a website bot, chatbot app, social media chatbot, as well as a voice assistant.

The value of using this technology is that it saves time and expenses by automating customer support in an e-commerce space 24/7. Another plus is that it generates leads and, thus, revenue by gathering preliminary information about a client.

As well, chatbots can redirect a prospective customer to the information they are most interested in.

A great customer service chatbot example is Hipmunk. This travel search engine uses the technology for travel-related questions and recommendations on their website. Also, the office supply retailer Staples uses a chatbot to offer products based on order history. It even helps to complete a purchase directly through a chat.

As the technology is relatively new, users will likely suspect that they are communicating with a robot; particularly when live-chatting. Chatbot technology is dependent upon a progression in NLP (natural language processing), and without considerable improvement in this field, it will remain a limited algorithm and continue to

struggle with more complex speech (jokes, metaphors, dialects).

On the other hand, with every passing year, e-commerce chatbots become more advanced and communicate more naturally. Who knows, they may become humanized to the extent we cannot distinguish them from real human beings.

Voice Assistants - Modified Word of Mouth



Voice Assistant

Voice search is widely used in services like Apple's Siri, Google Now, and Cortana from Microsoft, which also embed NLP technology. With regard to virtual e-commerce, like Amazon's Alexa, voice assistants have seen a great increase in popularity. The technology can be used to order goods directly from Amazon by voice command. As well, it quickly finds deals and can even order food deliveries from local restaurants.

A greater number of people, especially millennials, have begun to use voice assistance before they shop. With the general adoption of

smart speakers for the home, like Amazon Echo and Google Home, it is most probable that customers' first connection with a product would be through a sort of "word of mouth." What would you ask a voice assistant?

These assistants can recommend the most commonly requested items. This means that the top player will likely make all the sales. Therefore, in a similar way, we optimize our website searches using Google algorithms - the same approach is used in voice search logic.

Augmented & Virtual Reality - Innovative Shopping Experience



Augmented Reality in E-commerce

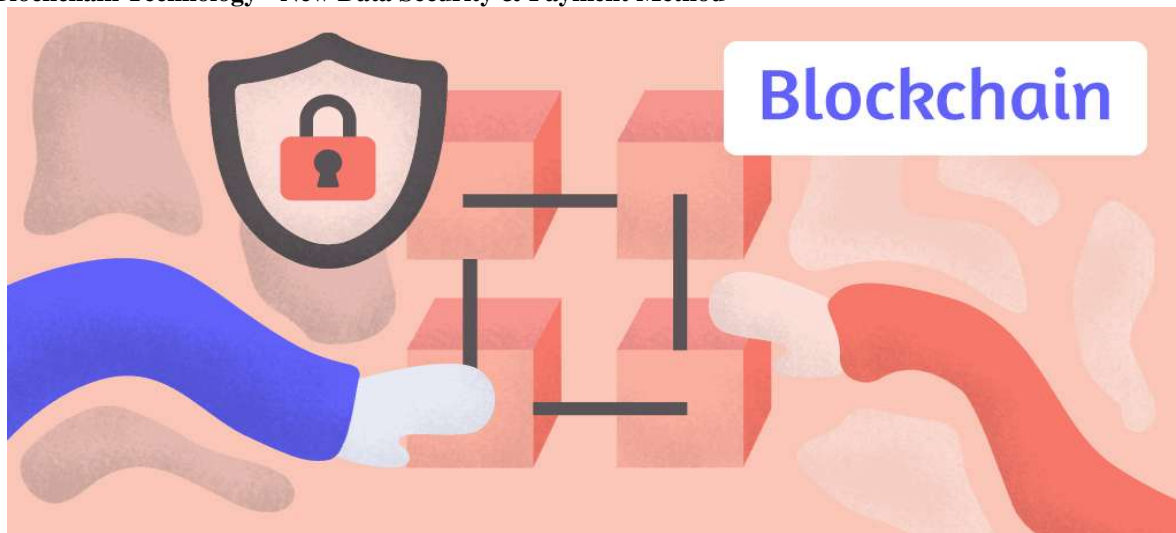
Both AR and VR apply similar technology, but many confuse the two. Virtual reality builds an entirely new artificial reality while augmented adds only some virtual elements into the real world.

You may think that these things are great now, but the idea of using VR and AR in e-commerce could change the future of online shopping concept. Just imagine if you could virtually interact and touch items before purchasing them. For example, you could virtually try on a dress, feel the fabric, and see how it suits you. Banana Flame, a British clothing e-store, has already incorporated AR, as it allows shoppers to use their web cameras as interactive mirrors.

It is not only fashion industry that benefits from AR; it is utilized by the beauty, furnishing, and auto industries as it allows users to visualize mobile purchases. Companies like Ikea and Audi have utilized augmented reality glasses so that users can design their own kitchens and check out cars.

Huge investments have been made in AR by Google, Apple, Facebook. As well, companies like Alibaba, Microsoft, and HTC are working on their AR technology in-house. TechCrunch indicates that the value of the VR & AR market accounts for \$108 billion. AR is becoming dominant and is being driven by its increased usage on mobile devices.

Blockchain Technology - New Data Security & Payment Method



Blockchain with a Lock

E-commerce is one of the industries being changed by the revolutionary use of blockchain technology.

With future of e-commerce growth, some side effects are bound to occur. There are issues with trust, slow transactions, higher fees and policies, and digital data ownership. With its concept of a distributed, genuine ledger of all digital transactions, blockchain helps to build trust in online payments. It also excludes frauds and provides a new payment method with the help of cryptocurrency (Bitcoin, Ethereum, Ripple, etc).

As a real-life example, Amazon has policies for its listed retailers. They reduce contact with their customers, as they can just send one follow-up email. Amazon employs its own customer support that is not acquainted with the

merchants` products. As a consequence, this reduces the credibility of the retailers and results in a higher cost to the customer.

At present, experts are working on the future of e-commerce marketplace. It is called ECoinmerce and will be blockchain-driven to solve the aforementioned issues.

The notion of transactions using digital assets eliminates the need for a third-party. Additionally, these transactions are faster and fees are decreased both for buyers and sellers. All data entered into a blockchain is stored there indefinitely. This means that no matter how many times a good is sold or repurchased, the transaction history always remains. This can go a long way toward eliminating fraud and boosting transparency

Drones & Droids - Next-level Delivery System



Drones Illustration

The tendency for robots to replace human activity has been observed over the last century. In the past, automated machines started working on car assembly lines and food production. As artificial intelligence and machine learning evolves, it limits people into the process, e.g in a delivery system. Currently, automated vehicles require human operation. However, it is more than possible that drones and droids will eliminate even this participation.

The future of automation lies in drones embracing the sky and droids on the ground. Despite many obstacles in drone delivery, the benefits of its adoption are great for retailers. This

will considerably cut costs in logistics operations. Amazon is in the first line with its testing of a new, fast drone delivery system - Amazon Prime. As well, a famous example in the food industry, Domino's delivered a pizza with the help of a drone in 2016 in New Zealand. Once drone airports become a reality, shipping time will be shortened to even a few hours. This is sure to boost online purchases.

The future of the e-commerce delivery system is expected to be focused not on a specific address, but on an individual person and their expected location and time. Pinpoint shipping, as this is referred to, would embed sophisticated AI.

Bottom Line



Looking Forward Illustration

Each new year will definitely bring more technological innovations to the online shopping industry. To stay visible, brands should discover new tech solutions that acquire loyal clients and provide a unique e-shopping experience. Currently, it is a must-have to be active on social media and to operate in the m-commerce sector. Meanwhile, the IoT is gaining popularity and is represented by smart devices like dash-buttons and beacons.

Even still, there's more to expect in the future of e-commerce sector. The successful cases of virtual reality, drones for delivery, voice assistants, and crypto-payments in the e-business spheres show that our journey of purchasing goods could exceed our imagination.

Technological Innovations That Will Shape the Future of E-commerce

A new wave of innovation is poised to disrupt the business yet again, especially the e-commerce sector. It's opening up new channels and giving online businesses better ways to interact with customers. They are creating opportunities for new products, new markets, and new business dimensions. The rapid advancements in gadgets, internet access, big data, and cutting-edge research are paving a way for a more interactive relationship between businesses and consumers. Thus the upcoming technological innovations are waiting to shape an astounding future of e-commerce. Here is how e-commerce is going to be revolutionized by technology:

Personalized Customer Experience

To a large extent, the future of e-commerce will be dominated by customer

experience (CX). Personalization is going to play a key role in terms of encouraging people to become loyal customers. Using personalization to reach audiences on any device creates multiple touch points and a more seamless customer experience. According to HubSpot, 76% of consumers say they view personalized experience as the true test of how much a company values them. As innovation continues to advance, retailers will be able to provide a highly tailored, individual experience to engage with and support their customers.

An excellent example of personalized CX is "contextual marketing", which incorporates real-time customer targeting based on intent. It effectively infers the needs of consumers in the moment they interact with a particular brand. This approach is truly about providing the unique individual customer experience based on their timing and intent. With this greater immediacy and relevance, there will be a further increase in response rates, conversions, and sales.

For e-commerce companies, the design of their online storefront is one of the main components to get consumers' attention. A good quality of website says a lot about the business, so making it attractive will be even more important in successful online sales and marketing. A well-designed website with personalized elements will be helpful in communicating the message efficiently to the target audience. It is essential for today's online retailers to have a high quality custom software development approach in order to provide a unique customer experience.

Voice Search

The evolution of voice search and voice-activated devices will change the way people do their shopping online. Many experts believe that voice commerce represents the next major disruption in the retail industry. According to a recent report, between now and 2022, voice shopping will experience 1,900% growth. Today, digital assistants such as Apple Siri, Amazon Alexa and Google Assistant have already made a lot of noise in the market. With further advancements in this technology, people will feel more comfortable using them.

Voice search is going to make online shopping much easier because it will curate recommendations and search results more easily according to individual needs. For example, a user is shopping for groceries. He can just tell Alexa about his special dietary requirements, and in response he will automatically get everything matching to his specific needs.

Voice search is great for repeat customers, too. They can simply tell their digital assistants to reorder the commodities that they had previously purchased. With the help of voice search, customers will also feel easier to leave reviews and ratings. They won't have to login and type for doing that.

As estimated by Statista, the global retail e-commerce sales are expected to reach \$4.88 trillion in 2021. This massive surge can be best explained in terms of exploding innovations that are laying a strong foundation for a huge e-commerce empire. Internet of Things (IoT) is an obvious catalyst of this trend. IoT is a network of distinct internet-enabled devices (physical), software and sensors that share data and exchange information between apps or users. IoT represents a paradigm shift that will help retail and e-commerce businesses to carry on their operations efficiently. According to a report, the retail investment on the Internet of Things is expected to reach \$2.5 billion by 2020. So how will IoT contribute to the e-commerce industry?

- **Inventory management** –IoT will make it a lot easier to keep track of inventory. With the help of IoT sensors and RFID tags, real-time inventory management will get a huge boost. They will improve the monitoring and tracking of inventory items, reducing human errors in reordering items.
- **Logistic management** – With the help of GPS and RFID, online store owners will get data like identity of the personnel involved, traffic conditions, location, weather etc. It will make logistic management extremely efficient.

- **Supply chain management** –to ensures that goods move from one place to another smoothly. It enables tracking of goods right from the production stage to delivery.

Augmented Reality

Augmented reality has already stirred the gaming sector in a big way. Considering its enormous potential in the e-commerce sector, AR/VR has plenty of applications. This revolutionary technology superimposes digital information onto the physical environment, thereby opening great opportunities for better consumer experiences. AR provides an interactive virtual window shopping in a more engaging way so that shoppers can browse through various products as though they are present there.

When consumers interact with digital information superimposed on a physical object that they are aware of, a sense of ownership is built around that product. Thus, in experiencing augmented reality content, users find themselves to be a part of a story, built around that particular commodity. Today, shoppers are not fully confident in evaluating and envisioning the sense of using a product while shopping online. Augmented reality bridges this gap significantly by way of helping users visualize the products they're considering to buy.

Artificial Intelligence and Smart Services

Artificial intelligence is profoundly impacting almost all the industries, and e-commerce is no exception. Intelligent, AI-driven algorithms can help personalize a consumer's shopping experience by analyzing their past buying habits. E-commerce business owners can now get smart predictions of market trends through multiple channels, such as consumer data, social media data, surveys, and from financial institutions.

An excellent example of AI-driven smart service is chatbots. A chatbots software technology that imitates real human interaction in a written or spoken way. With the help of this technology, e-retail owners can save their time and expenses by automating customer support in an e-commerce space 24/7. Today, consumers are more demanding and expecting lightning fast responses to their inquiries. So far it has been a challenge for e-commerce businesses to meet these demands in real-time. Chatbots, however, can go a long way in providing customers necessary information and other types of help.

Blockchain

Considered as one of the most disruptive technologies of the current era, blockchain can transform e-commerce landscape in a big way. In the simplest terms, Blockchain can be described as a data structure that holds transactional records and while ensuring security, transparency, and decentralization. In blockchain, transactions are digitally encrypted so that the data remains secure.

Cryptocurrencies that work on blockchain structure can be an alternate payment option for e-commerce settings. Payments and exchanges with fiat currencies are a bit longer and costlier option, which is why bitcoin or other cryptocurrencies are on the rise. Blockchain can also make shipping 'smarter' by providing encryption in deliveries, as well as technology to create a controlled environment. By adding smart contracts into the blockchain, the inventory can be managed and the items can be ordered automatically.

Drones

Drones and robots can play a key role in the expansion of e-commerce market in the coming years. Today, people need instant deliveries and what else than drones can make this possible. Currently, the global giants like Amazon and Alibaba, all are turning their interest in the usage of drones in business. With the advanced aerial technology used in drones, consumers can get their products quickly, that too at a lower cost. Amazon recently announced "Amazon Prime Air" – a delivery system designed to get packages into customer hands in less than half an hour. Thus, drones are going to skyrocket the customer satisfaction to the next level.

CONCLUSION

With the exponential advancements in technological trends, the face of e-commerce is going to be changed forever. There are more exciting innovations yet to come that will make e-commerce industry a more lucrative business. For now, the above mentioned technologies will make profound ripples in this sector.

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