E-commerce ecosystem: Fundamental concepts, business models and cybersecurity issue

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ABSTRACT

Recent developments in communication and internet technologies have broader effects on supply chain activities. These developments made it mandatory to adopt technological changes and innovations in our existing understanding of electronic commerce activities. This study aims to develop a critical approach to the e-commerce ecosystem with fundamental concepts, business models, and security issues. This paper suggests companies ways of coping with adopting e-commerce activities, business models, and security issues.

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Introduction

Today, e-commerce is developing rapidly and continues to develop day by day. This development movement is starring the Internet. From one computer via the Internet to another computer that is a vendor or service provider, an order is created and payment is processed. Computers could not be expected to develop so much in an order where the Internet does not exist, so e-commerce development could not be mentioned. The possibility of trading would only have to continue as traditional trade. These developments on the Internet have allowed us to emerge from e-commerce as well as traditional trade. The rise in the middle-class population in developing countries and the increased tendency to spend accordingly support the e-commerce sector. High speed internet infrastructure, an increase in the number of internet users and international investments are among other supporting factors. Due to China's 3G infrastructure developments, it has benefited greatly in recent years from increases in mobile use. On the other hand, in countries where electronic commerce is developing rapidly, there has been rapid growth in B2C trade and other types of trade. Online trade volume in South Korea was around EUR 29 billion at B2C, while B2B had a trading volume of EUR 967 billion (Türkiye İş Bankası, 2013).

In e-commerce, shopping should be done in a safe environment. However, some security measures are needed for this. In e-commerce, many security problems such as fraud and fraud, copying of information, obtaining private information, cyber-attacks are also encountered. It is necessary to take the measures needed to eliminate these safety problems. Ensuring security in e-commerce takes place through four key features; Customer confidentiality, the honesty of information, authenticity, debt reason (Doğan, 2018). In electronic commerce, some measures are needed to ensure mutual trust, as the buyer and seller engage in commercial activity without seeing each other. Above all, buyer and seller parties want to carry out their transactions without doubting the accuracy of each other's identities and the security of the information they send. This need has resulted in the emergence of various security algorithms over time (Doğaner, 2007)

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This paper examines the fundamental concepts of e-commerce, introduce e-commerce business models, payment options and security issues throughout the following sections.

Development and scope of e-commerce

E-Commerce is one of the most suitable commercial business and transaction methods between buyers, sellers, and suppliers. Globally, the understanding of trade has gained a new momentum. In parallel with these developments, new ways including electronic trade channels are emerging to meet our needs. Electronic commerce consists of creating orders using computer networks of goods and services or products, supplying, performing payment process, logistics phase and conducting after-sales support stages electronically. The scope of electronic commerce is broad. The parties' existence to carry out all kinds of goods and services, purchases, and sales subject to purchase and sale is covered by electronic trade. All types of people or institutions can perform e-commerce activities. Electronic commerce covers all transactions related to the design, production, promotion of the product, and the payments of the transactions made through all kinds of computer networks. Electronic commerce means performing a business electronically. Therefore, it includes electronic processing and transmitting of written text, audio, video format data. Activities include the electronic exchange of goods and services, instant source delivery of digital contents, public procurement, direct consumer marketing and after-sales supports (<http://www.elektronikticaretrehberi.com/e-ticaret>, 2006).

The scope of electronic commerce can be listed as follows (Doğaner, 2007).

Electronic exchange of goods and services, planning production and creating a production chain, Promotion, advertising and information, Place an order, Make a deal, Electronic bank transactions and fund transfer, Send an electronic bill of lading Clearance, Production monitoring in an electronic environment, Electronic shipment tracking, Co-design development and engineering, Public procurement electronically, Transactions related to electronic money, Electronic share exchange and exchange Keeping and commercial monitoring records, Direct-to-consumer marketing, Digital Signature, Reliable Third Party (TTP) transactions such as electronic notaries, etc., Instant distribution of digital content, Instant information creation and transfer Taxation electronically, Transfer of intellectual property rights. Table 1 compares the e-commerce market sizes across the globe:

Table 1: E-commerce Comparison in the World 2018

Country	Online retail/Total Retail	Fixed Broadband Penetration	Mobile Broadband Penetration	Online Shoppers	Mobile Shoppers	Per Person Income\$ PPP	Population (mn)
UK	17	39,9	98,5	81	45	\$45.7K	66.4 mn
USA	13,7	33,4	136,6	77	44	62,6	328,1
Germany	11	40,7	81,0	81	29	52,5	82,7
France	8,8	42,9	85,5	71	26	45,7	65,0
Japan	8,6	31,1	168,1	68	34	44,2	126,4
Spain	4,6	31,6	96,9	72	40	40,1	46,2
China	23,7	31,8	98,1	82	74	18,1	1.396,9
Poland	6,7	18,4	102,6	76	36	31,9	37,9
India	5,2	1,5	35,9	74	60	7,8	1.334,2
Brazil	7,2	14,6	96,7	68	45	16,1	209,2
Russia	5,0	22,7	90,3	58	32	29,2	143,9
Turkey 2017	4,1	14,7	69,9	43	30	26,9	80,8
Turkey 2018	5,3	16,3	74,5	67	50	27,9	82,0

Source: TÜBİSAD Deloitte E-Commerce Market Size in Turkey April 2019 Report

Classical trade has been replaced by electronic commerce moving the system where people/interagency trade is made to the electronic environment. Several tools enable electronic trading. These tools are needed to create orders, purchasing, payment transactions, logistics and delivery stages in the purchase and sale of products or services that are needed according to the situation and the way they work.

Electronic commerce has versatile tools. It is seen that most of these tools have been used for a long time in our daily lives. This shows us that electronic commerce is not a new concept. Electronic trading tools such as data exchange between businesses (EDI), Electronic Funds Transfer (EFT), Television, Fax, Telephone have been used for a long time. However, electronic commerce seems to have just been discovered, especially with the Internet's significant place in our daily lives. Especially in the last 5 years, this development has gained great momentum.

The Open Protocol (TCP) internet protocol (IP) coding system provides access to www areas. It offers new possibilities while providing more efficient, fast and less costly electronic commerce using traditional trading tools. For this reason, electronic commerce has developed since 1995 and continues to be widespread today (Doğaner, 2007).

Basic tools of electronic commerce:

- Phone
- Fax
- Television
- Computer
- Electronic payment and money transfer systems,
- Digital Television,
- Telecommunications
- Gsm.
- Electronic Data Interchange (EDI),
- Internet,

Although it is not limited to the ten primary vehicles mentioned above, the concept of e-commerce can be associated around. However, the idea of electronic commerce is often accepted as trading via the Internet and other networks, and evaluations are made on these tools. Internet and Electronic Data Exchange (EDI) has a more important place in electronic commerce than the other four vehicles. With these two tools, the instant reliably transmitting of data and the realization of trade through the Internet allows transactions to take place faster and has a cost-reducing effect (Canpolat, 2001). Table 2 summarizes the e-commerce tools.

Table 2: Tools of Electronic Commerce

Traditional tools	New vehicles
Phone	WWW (World Wide Web)
Radio	Ftp
Television	E-mail
Fax	Spoken Message
Electronic Payment and Money Systems	Conference Systems
Cash Machine Machines (ATM)	· Teleconference
· Credit Cards	· Data conferencing
· POS Machines	· Video Conferencing
Intranet: Closed Computer Networks	· Gsm
· Electronic Fund Transfer (EFT)	· Sms
· Electronic Data Exchange (EDI)	· Wap

Source: Murat Doğaner, 2007:18

The Internet has appeared in the UNITED States. Communication led to the investigation of the new communication system due to the state of war in which the United States was involved, since it was not possible to use traditional communication methods during the war. As a result of the research, a ARPA unit (Advanced Research Project Agency) was established. ARPA's installation's underlying reason is that communication is provided very well and there are no interruptions to respond to the necessary response due to nuclear war. In 1969, a connection was made between ARPA and four computers located in California and Utah. Arpanet (Advanced Research Project Agency Network) was established by improving these systems' connection to each other. The NSFNET system was started to be used by NSF with the lack of communication provided by ARPANET. It is aimed to ensure the development of ARPANET with NSFNET. It was then granted access to third parties and businesses for the continuity of action. Www (World Wide Web) was developed in 1990. ARPANET completely deprecated (Yüksek, 2020)

The Supreme Court of the United States ruled that the Internet: "*The Internet is an international network of computers connected. The Internet is a completely new and unique environment for individuals to communicate worldwide.*" It is seen that one of the advantages of the Internet is the cost element. When we look at the cost of any transaction on the Internet, it is seen that it is more suitable than other transactions (Canpolat, 2001). Because there are many advantages that electronic media brings. In regular trade, cost elements such as store elements, personnel elements are endured. Electronically, these costs disappear and become more affordable.

In April 1993, Turkey was connected to the Global Internet within the DPT project framework due to the cooperation between TUBITAK and METU. This line at a speed of 64 kbit/san is given only through METU. Later, METU was followed by Ege University, Bilkent, Bosphorus and ITU. Turnet, which was created as a result of the tender opened by Türk Telekom in 1995, started to work and in 1996 a formation called National Academic Network and Information Center (ULAKBİM) was established within TUBITAK. In 1999, TTNET was created to replace TURNET (Çakır, 2005).

Table 3: Internet Transaction Costs

Through	Cost (\$)
Airlines	7,4
Courier	26,25
Fax	28,83
Internet	0,10

Source: Stats (OECD, 2017)

Table 3 demonstrates the internet transaction costs compared with classic methods. Table 4 illustrates the internet users in 2016, by countries.

Table 4: Internet users by country 2016

Queue	Country	Internet Users
1	China	904.080.566
2	India	718.740.000
3	U.S.	246.390.854
4	Indonesia	171.176.716
5	Brazil	150.410.801
6	Nigeria	136.203.231
7	Russia	118.446.612
8	Japan	116.505.120
9	Bangladesh	102.113.000
10	Pakistan	83.178.124

Source: Stats (OECD, 2017)

E-Commerce and Cybersecurity

Effective business performance depends on digital competitive factors and its ability to transform corporate capabilities in the light of digitalization. The functionality of the newest technologies is prone to changes in climate conditions. There is a need for developing a practical approach to the latest technological components, cyber-security issues of automated vehicles, and their role in effective supply chain management. It should be also noted that automated systems reduce ineffective distribution while having a role in supply chain management (Hacıoglu and Sevgilioglu, 2019; Hacıoglu, 2020; Hacıoglu, 2019; Hacıoglu, 2019 (b))

Parties in automated systems try to take some security measures during the shopping process because electronic commerce parties do not see each other. Classical trading individuals provide security with identity, signatures and such documents in order to ensure mutual trust, but systems such as signatures and certificates are also used in digital environments. People who make online purchases expect their business relationships as in classical trade. The parties are safe thanks to digital signatures and certificates from the information of the other person. In electronic trading environments, it is very risk that credit cards and similar information will fall into the hands of third parties. However, this situation has decreased due to the security measures taken in online purchases (<http://www.elektronikticaretrehberi.com/e-ticaret>, 2006).

One of the most critical problems is the cybersecurity problem as a result of the increase in internet usage trends and in parallel with the rapid increase of electronic commerce applications. One of the biggest obstacles to the developments in electronic commerce is seen as a security problem. According to research conducted in the United States, the total value of stolen data in one year is more than \$10 billion. In 1996, according to a study conducted with 1320 companies, 78% of respondents stated that they had lost money due to lack of security, 63% had suffered losses due to viruses and 20 users had lost \$1 million. The main security issues are;

- *Access to network resources even though access is not authorized,*
- *Destruction of information and network resources, damage,*
- *Changing, mixing or adding new things to existing information,*
- *Transmitting information to unauthorized persons,*
- *Theft of information and network resources*
- *Denial of the services received and the information sent or received,*
- *Causing network services to be discontinued and disrupted,*
- *Allegedly receiving or sending information that he did not receive or send (Anbar, 2001)*

According to the information contained in the DPT's (2010) Information Society Statistics report, the restriction of online sales, with 48% in 2008, is due to security issues related to payments (KMK Akademi Yayınları).

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Ensuring security in e-commerce takes place through four key features. They're like, "I" Customer confidentiality, the honesty of information, authenticity, debt reason (Doğan, 2018). In electronic commerce, some measures are needed to ensure mutual trust, as the buyer and seller engage in commercial activity without seeing each other. Above all, buyer and seller parties want to carry out their transactions without doubting the accuracy of each other's identities and the security of the information they send. This need has resulted in the emergence of various security algorithms over time (Doğaner, 2007)

Digital signature (E Signature)

Digital Signature is electronic data added to another electronic data and has a logical connection between them and is used for authentication. E-Signature is equivalent to a manual signature and includes the same responsibilities (Büyükyıldırım, 2004). The term electronic signature is the name given to the system, which contains the electronic certification procedures of the document, which is correctly correctly correctly correctly accurately corrected by the signer of a document. In a broad sense, an electronic signature is a system in which personal information is merged into the electronic system to sign a document. The document is controlled by the signer on the document, confirmed, and placed on the signer side as in the actual documents (Koç & Sevim, 2010). According to the U.S. Electronic Signature Act in Global and National Trade: "Any electronic audio, symbol or recording, created or used by the person attached to a contractor who can make a logical connection and intends to sign the record" (Altundağ, 2006).

An electronic signature is essential for faster and more systematic progress of jobs and transactions and saving time and stationery. E-signature in Turkey started to enter our lives with electronic signature law no. 5070 issued in 2004. In our country, the e-signature period has started in many institutions from private institutions to the state sector. Among the main security objectives included in digital signatures (Altundağ, 2006);

- *Confirming the identity of the person*
- *Protection of privacy of personal information*
- *Ensuring the integrity of data*
- *There is undeniable.*

The electronic Signature also includes a digital signature created with dual-key cryptography. Personal information is included. This information is merged with a PIN code application and is the process of transferring it to electronic media (Ertugut, 2004).

Digital Certificate

A digital certificate is a method of digital protection by certificate issuers. It should not be confused with digital signature and Encryption, and digital certificate is not encrypted as is digital Signature. It was created to provide control of the document signed by digital Signature and resembles a digital version of the identity documents such as the person's driver's license and passport. The certificate is also a security verification system belonging to the credit card bank of the digital signer.

Companies and most institutions operating in electronic commerce use certificates to prove that they are a real and legal company on the Internet. It is also important to encrypt the transactions and confirm the accuracy of the transactions with a certificate in cases where the real identities and data of people such as internet banking transactions or online purchases are ensured (Erturgut, 2004).

Open and Secret Key

Public and secret keys are the name given to numeric algorithms used in encryption operations, with a unique mathematical relationship between them. A public key is an algorithm system that belongs to the person and is reached by everyone. The secret key is an algorithmic system that can decrypt information encrypted with a public key and is only found in the person. The public key system can only decrypt information encrypted with a secret key. Hidden key information cannot be generated from public key information, and public key information cannot be generated from secret key information (<http://www.elektronikticaretrehberi.com/e-ticaret>, 2006).

Public keys are used to ensure reliable application of electronic Signature in electronic commerce on the Internet. Thanks to the open keys, it is determined by whom the electronic Signature was sent and its reliability.

Both the public key and the closed key are given to the user who benefits from the e-commerce system. Thanks to these keys, if the user is going to send information to the other party that they only want that person to read, they can send it by encrypting it with the other party's public key. To sign this information, it also uses its own key. The other party can decrypt and read this encrypted information using its own secret key. It can analyze the information from the right person using the other party's key and confirm its accuracy. It is a controversial issue in the production and storage of keys. While some countries consider the need to store these passwords by a consent agency, they have opinions that these keys should only be protected among individuals in some countries (Şimşek, 2012).

Encryption

With the increase in the use of e-Commerce, it comes with many problems. Due to the trade's reliability, protection of information, prevention of attacks, fraud and fraud, several measures have arisen. Some techniques are needed to determine the accuracy of the information in the parties' commercial relations. Encryption is therefore carried out. Encryption is very important for secure storage of information and not allowing it to fall into third parties' hands for electronic purchases. Encryption is more used to ensure the reliability of card information when paying by credit card. The storage of credit card information is thanks to this technique.

Cryptography is called the system that develops encryption and decryption methods to ensure secure data communication and store data. Digital Encryption is called the only other party readable information sent over networks by changing the contents of the information sent over a specific password key (<http://www.elektronikticaretrehberi.com/e-ticaret>, 2006).

Encryption provides the basics of e-commerce security. Encryption in e-commerce is during commercial organizations' relationships with each other and to ensure trust between consumer and business. Encryption plays an important role in securing data in online transactions, but guarantees the confidentiality of transactions to prevent unauthorized access to transactions containing confidential information. A key system such as PKI (Public Key Infrastructure) is used to mix information sent during the process in an unreadable and incomprehensible way. The mixed information can only be solved by matching the key (Doğan, 2018).

Approval Agencies

To ensure security in the electronic trading system in the exchange of information belonging to the customer/seller during the purchase of goods and services, such as copying, leaking, etc., a third protection system is needed as a protector of the information in the system. Electronic identification documents are issued for this protection system and approval agencies are present for this document (<http://www.elektronikticaretrehberi.com/e-ticaret>, 2006).

Security Protocols

Ensuring security in e-Commerce is crucial for a healthy trade. Ensuring security is only done through security protocols. Protocols commonly used to ensure security;

- *SSL (Secure Sockets Layer) Protocol*
- *SET (Secure Electronic Transaction) Protocol*

SSL (Secure Sockets Layer)

The SSL protocol, which is called Secure Sockets Layer, is a security protocol that ensures that the transfer of information used in communication processes on the Internet is accurate in order to establish security. The SSL protocol is carried out through e-commerce. During the shopping phase between consumers and stores, it is carried out to encrypt the communication between the consumer and stores and decipher the messages in the right person. The SSL protocol uses a public key encryption method (Yüksek, 2020).

The purpose of the security protocol developed by Netscape aims to ensure the concealing and security of data on the network. The first version was released in 1996 and is defined as 3.0. With SSL, the information requested to be sent with encryption technique can be sent and deciphered at any time and place. Encryption of data with the SSL protocol has both ensured information security and contributed to its development by increasing confidence in electronic commerce (Vural, 2015).

SET (Secure Electronic Transaction)

SET is a protocol developed by organizations including VISA, MasterCard and IBM in online transactions to ensure secure information transfer in electronic commerce. SET is a system specifically developed for online credit card information transmission. SET provides privacy and security connection for credit card payments on online shopping platforms and information transfer over the Internet. The SET protocol only encrypts the payment portion between the customer and the online store and credit card company. Anyone who is a party to the payment process with SET knows each other through this protocol and can be proved in case of possible situations. Recognition is done with a digital certification system. That is, all parties, including the payment section, use a digital certificate that specifies their identity (<http://www.elektronikticaretrehberi.com/e-ticaret>, 2006).

After the customer chooses goods and services, the authorization process begins with the customer's virtual wallet being associated with the virtual pos where he purchased the product and proving its accuracy. The amount withdrawn with virtual Signature and virtual pos is forwarded to the bank and the process is continued. As a result of the purchase, the information of the order is not seen, but authorization is given. The online store, which is not authorized to see customer information, issues the order to be delivered to the buyer with the approval of the bank. As with SSL, the data between the company and the bank are encrypted in the SET system and the confidentiality of the information is protected. In order to benefit from this type of transaction, SET compliance is sought and the customer who wants to make purchases with this system security must comply with two rules. A separate certificate must be obtained for the credit card to be used and they must obtain the virtual wallet software issued by the banks after they are received. In this way, the computer with SET compatible software and the sites working with SET are exchanged (Vural, 2015).

Business models in E-commerce

E-commerce is the creation of new business models. This is achieved by achieving organizational goals. In e-commerce, business models vary depending on which environments and which parties the trade is in and is not. In this case, the parties differ in terms of business models in E-Commerce and electronic commerce users. It develops its trade relations with each other and tends to create revenue.

Business models are divided into three.

- *According to the way it works,*
- *By platform*
- *According to the business model*

Business-to-Consumer Electronic Commerce (B2C)

Business-to-Consumer Electronic commerce is short for B2C, the initials of the English words Business to Costumer. This type of trade is the process of selling the goods and services of the business to the customer (sales, shipping, invoicing, etc.) on the electronic platform.

Type B2C e-commerce has become quite common today and is the most preferred type of trade. Due to the Internet and mobile system developments, the new form of trade brought sellers and customers together (i.e., hepsiburada.com, n11.com, gittigidiyor.com). These platforms bring together the sellers and buyers widely used by both individuals and institutions. On these platforms, multiple sellers and multiple buyers meet and the most preferred sellers appear with the scoring system and versatile and reliable trading is carried out.

In 1990s, B2C type trade began, and Seattle-based company Amazon.com which started selling books online in 1995, is the first of the well-established companies known in the e-commerce sector (Civelek, 2017). From a country's point of view, 54% of the UNITED States' total population is shopping online, and 10% of consumers' shopping expenditures are through e-commerce. On the other hand, China has 550 million internet users and close to 220 million online shopping consumers, and the B2C market grew by 88% in 2012 (Türkiye İş Bankası, 2013).

China and the U.S. are leaders in the B2C e-commerce type. In 2018, china ranks first in the e-commerce market size of \$634 billion. With sales of \$504 billion, the U.S. ranks second. Japan has \$123 billion, the United Kingdom has \$86 billion, and Germany has B2C e-commerce market revenue of \$70 billion. (E-Ticaret Bilgi Platformu, 2020).

Business-to-Business Electronic Commerce (B2B)

Business-to-business electronic commerce (B2B) is the abbreviation of the initials of Business to Business. B2B is the type of e-commerce between two businesses. The goods or products of one business are sold to another business and all of these transactions are carried out electronically, which shows that B2B electronic trading is happening between the parties.

It is the most widely used form of electronic commerce. Also called Electronic Data Exchange. It consists of forming orders to the supplier electronically, the provision of invoices and the payment of the price of goods and services and the delivery of distribution and delivery of products (<http://www.elektronikticaretrehberi.com/e-ticaret>, 2006). The goods or products of one business are sold to another business and all of these transactions are carried out electronically, which shows that B2B electronic trading is happening between the parties.

B2B sites are divided into three.

- *Large-scale B2B sites*
- *Sectoral B2B sites*
- *Private B2B sites (Civelek, 2017).*

B2B e-commerce volume in the world is 10 trillion dollars. This figure is equivalent to 5 times B2C e-commerce. In developed countries, the proportion of online retail sales in total retail sales was 11.1 percent. In developing countries, this rate was 5.9 percent (E-Ticaret Bilgi Platformu, 2020). B2B sites can also be said as platforms where companies carry out the supply leg.

Business-to-Public Electronic Commerce (B2G)

Electronic commerce from business to public consists of the initials of the English words Business to Government. It covers commercial transactions between the customer and the state. It is a model that is between the business and the state and is currently under development. In this model, transactions between the business and the state are carried out electronically (Uygur, 2020).

In the B2G trading model, the announcement of tenders opened by the state in a virtual environment and companies' purchase by participating in these tenders and the sale of goods and services according to the tender principles can be shown as examples.

Consumer-to-Consumer Electronic Trading System (C2C)

Consumer-to-consumer electronic commerce is an abbreviation for the initials of the English words Customer to Customer. In this type of e-commerce, the consumer is the form of trade in a virtual environment against the customer's demand by placing products on both personal and platforms (such as cabinets, letgo). Today, it is a species that has just started to be used.

The C2C market usually dominates the type of electronic commerce where second-hand products are traded. It is also done as an auction system or in the form of an auction. In the form of this sale, a dropshipping agreement is made between a business and individuals and it is trying to find customers for its products through C2C sites. After the sales process takes place, it sends the order to the business and is sent to the customer with the product invoice. The intermediary is commissioned. C2C sites are also called advertisement sites. Companies such as real estate brokers and auto dealerships also operate on C2C sites. In this case, it is taken into account that the goods are second-hand and that the final buyer and seller are individuals (Civelek, 2017).

Payment Systems in E-Commerce

With the introduction of electronic commerce into everyday life, new and reliable payment systems were needed. The reliability of the information used during payment transactions is very important.

Credit/debit card is widely used as a means of payment. However, these card information used must be stored reliably. Accordingly, payment systems have been developed. Payment systems include;

- Virtual Pos
- 3D Secure payment
- Bkm Express
- PayPal
- PayU

Virtual POS

With the development of e-commerce and the increase in the credit utilization rate, the use of virtual pos has become quite common. Today, there are almost no individuals without credit cards. For security reasons, the rate of carrying cash in your pocket is decreasing day by day. In this case, it has been a factor that reduces cash exchange. Individuals who do not want to choose the cash payment method use virtual pos with credit card payment. According to the Inter-Bank Card Center data, there are 69.8 million credit cards in Turkey as of the end of 2019. Of these cards, 65.1 million are individual and 4.7 million are commercial cards. In 2019, there were a total of TL 844 billion and 4.3 billion credit card payments. There are 166.2 million debit cards and 2.2 billion TL payment has been made.

3D Secure Payment

With Visa and MasterCard's 3D secure payment method to secure virtual POS payments, customers are directed to banks' 3D secure payment pages at check-in time by e-commerce sites. Here, 3D payment is made using phone verification and password, at which stage these payments are made without being caught in the provision by lying to the card holder with a two-step security question

(Büyükyıldırım, 2004). It is the system used to determine whether the person who is shopping on the e-Commerce site is the card's actual owner. Thus, the screen consists of security questions and thus the security question determined by the person is coming so that shopping security is provided. This service is provided by the bank, not by the shopping site (KMK Akademi Yayınları).

BKM Express

It is Turkey's first known digital wallet application. BKM express free, easy and secure payments are made digitally. It has 1.7 million members and serves at 200,000 locations. Once the information is entered, BKM express member points are easily and safely exchanged without entering card information via Internet or mobile. Today, BKM express allows easy shopping from fuel to education, shopping and all sectors. BKM also allows money to be exchanged from express Android and Iphone applications. The transaction is carried out by sending a text message, whatsapp or e-mail to request money, and to send money, provided that the recipient card number is entered (BKM, 2018).

Pay Pal

It is the system that is controlled by a single authority in virtual accounts opened on the Internet and allows the transfer of money. A Pay pal account is opened provided that credit card and debit card information is entered once. And thus, online payment process takes place without the possibility of access to account information by third parties. After Pay pal makes the money transfer, the money is transferred to the bank by the seller (KMK Akademi Yayınları).

PayU

PayU is a system that provides the necessary infrastructure and hardware without the need for a single contract and another connection without the need for e-commerce sites to receive virtual pos. Sites can offer their products and services to credit and bank owners using the virtual POS owned by PayU. PayU, a subsidiary of Naspers, which includes the world's most important media and e-commerce brands, operates in 13 countries. PayU, which works with more than 15 thousand-member workplaces globally, started its activities in Turkey in 2011 (Kalkınma Bakanlığı & McKinsey&Company, Şubat 2013).

Virtual pulp is needed for companies to trade/sell through an electronic trading system. However, since this will create significant costs to companies, sales transactions can be easily made through a single virtual pos using the PayU system. Although the PayU system is entirely secure, security measures such as the SSL encryption system and McAfee are used at check-in time (Altun, 2016).

Conclusions

The information has great importance in terms of the general performance of a supply chain. Because the supply chain managers decide on this basic concept. Information technologies consist of tools and materials that are used to gain information awareness. The performance of the supply chain is trying to be increased by analyzing this information and moving on this necessary foundation. For example, while e-Business Management technologies affect the integration of the product information in a supply chain, supplier integration affects the operational function and activities of the company (Hacioglu and Sevgilioglu, 2019). All of these proves that IT has significant importance in combining suppliers and partners in a virtual business and the supply chain. Numerous technologies can be used to analyze and share information in the supply chain It is possible to give Electronic Data Interchange (EDI), Internet, Enterprise Resource Planning (ERP), Radio-frequency Identification (RFID) and Supply Chain Management/Planning (SCM/SCP) as an example of the most frequently used technologies (Ozdemir, Dogan, et al., 2010:4). Managers have to decide which technology should they use and how can they manage to integrate this technology into their own and partner's businesses. These decisions are becoming more critical with the increasing efficiency of these technologies (Ozdemir and Dogan, 2010).

E-commerce with its impact on business models and transformation process of e business will attract the companies and researchers to boost their studies in academia.

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