

Evolution of Portable Devices

Ali Almasli

*Faculty of Engineering and Applied Sciences,
Khazar University, Azerbaijan*

Email: ali.almasli@khazar.org

Abstract

In 2007, the milestone of smartphones, Apple Company, under the leadership of Steve Jobs, released the first iPhone, where applications can be personalized. Although this device is a mobile phone, it made history as the first device with a large touch screen and an internet connection and added a new dimension to the market. In 2008, after the sales success of Apple, the Taiwanese HTC Company launched the first commercially named HTC Dream with the Android operating system, which is open-source code against Apple's IOS operating system iPhone, allowing development by other people and companies. The article examines the development path of mobile phones in the recent period.

Keywords: smartphone, IOS, apple, company, phone

Introduction

The dizzying developments in the smartphone market, and the development of mobile internet infrastructures in parallel with this, meet all the daily life needs of personal users (entertainment, shopping, education, health) in the world. Commercial companies, on the other hand, have started to transfer both their business processes and sales processes from desktop software to mobile software. In this way, people have the convenience of doing almost every operation that they can do with their portable computers, which they carry in their pockets, with their smartphones, that is, with the devices in which they have an internet connection, as an even simpler way of performing their transactions from portable computers and places where they can find internet service (Uğur and Turan, 2015).

Examples of these include banking transactions, video calls, smart home applications that can be managed from smartphones, and many other conveniences. In our country, the majority of the population and the increase in GSM operators have made it possible for smartphones to reach even low-income families, with the increase in service quality and internet speeds, as well as the decrease in tariff fees and the advancement of the information technology network all over the world. According to the data of mobile operators operating in Turkey, the subscription rate exceeding 80 million is an indication that everyone has at least one smart mobile phone in their pocket. The features and processing capabilities of smartphones have allowed doing all the daily operations on computers. As such, people perform many transactions in daily life, within a few minutes, thanks to mobile applications on smartphones. Shopping, entertainment applications and social networks can be followed on mobile devices; By purchasing e-newspaper and e-book applications from application markets, smartphones have become an indispensable part of humanity, not just a communication tool.

According to the mobile market report published by BTK in the third quarter of 2018; As of the end of September 2018, there are 80,637,671 mobile subscribers, including M2M subscribers, which corresponds to 98% of the investments made in Turkey (Information Technologies and Communication Board, 2018). There are 80 million 810 thousand 525 citizens in Turkey according to the last address-based census data made on 31 December 2017 (Turkish Statistical Institute, 2017:80). As it can be understood from the figures, it is a proof that there are more mobile subscribers than the population of Turkey and that mobile devices are used together with it. The most important factor was the increase in mobile line subscriptions, the development of the transaction capabilities of mobile devices, the decrease in prices to access levels, as well as the fact that GSM operators attach great importance to infrastructure investments in order to make their mobile internet infrastructures signal in almost every part of Turkey. 3G1 service, which was put into use in July 2009, reached 65,949,652 subscribers as of the end of March 2018. While it decreased to 8,662,636 at the end of September 2018; The number of 4.5G subscribers increased to 69,341,236. In Figure 1, the number of 2G, 3G and 4.5G mobile subscribers and their usage rates are compared by years. On the other hand, as of the end of September 2018, the number of M2M2 subscribers reached 5 million. (Information Technologies and Communication Board, 2018)

When all the report data are examined in general, we observe that mobile communication service providers in Turkey have developed their infrastructure and in parallel, mobile internet usage of mobile internet users has increased exponentially. With the increase in mobile internet speeds, and the widespread use of mobile devices, the companies that develop mobile applications are developing

both within the market and within their own domestic markets, and the packaged software used on desktop computers is rapidly leaving its place for mobile applications.

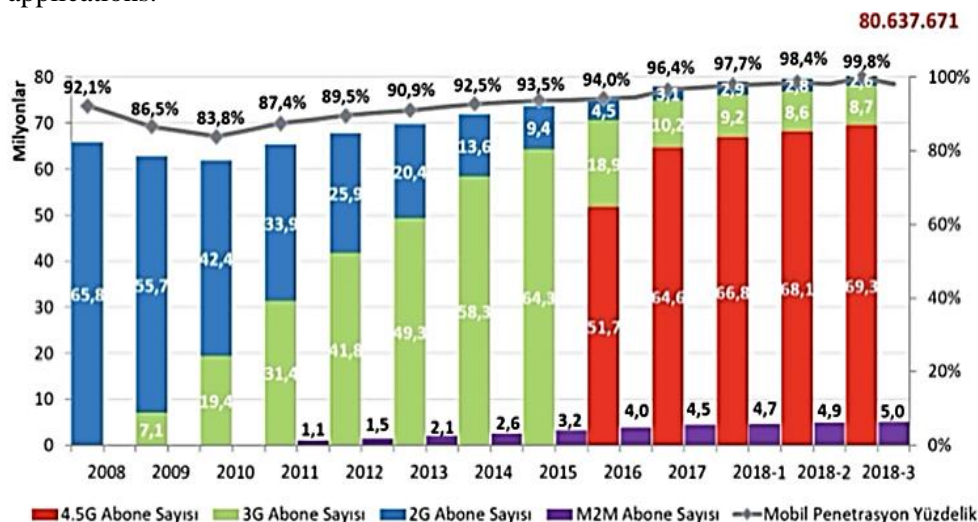


Figure 1: Total Mobile Subscribers and Comparison to Population

Source: BTK Turkey Electronic Communications Industry Quarterly Market Data Report 2018 3rd Quarter, p58

In fact, e-commerce companies, which sell most products and services, develop mobile applications or interfaces for accessing web pages with mobile devices and provide their customers with the service of accessing web pages and shopping in a shorter time than the time it takes to reach the web page by typing in the browser. To meet the needs of people, mobile applications are developed in almost every field. The main reason why smartphones and tablet computers are personal and so attractive to use is the existence of usage-specific mobile applications that can be loaded into them. It is known that the majority of mobile application developers are companies that develop operating systems.

Among the mobile applications that facilitate daily life, speed up and make mobile device use more functional, perhaps the most important is health applications (Demir 2016). Compared to the past, people live longer today and are conscious of a healthy life. The field of health is becoming an industry, as health investments require huge sums of money and satisfy its investors in this sense. Health tourism between countries is increasing exponentially every day. In addition to all these, together with the benefits of technology, health services are digitalized together with the

benefits of technology, preventing transaction costs such as e-health and mobile health, and data repetitions are prevented to a large extent. It is aimed to provide more qualified health services and more qualified health personnel staff (Erol and Özdemir, 2014).

In light of all these, T.C. The e-Nabız "Personal Health Data Recording System" mobile application developed by the Ministry of Health allows people to follow up on their health data and to have more qualified information about the examination, treatment, health institution and personnel. All these are very important in terms of providing more transparent and higher quality healthcare services and minimizing transaction costs.

Evolution of Mobile Devices

Although smartphones, of which almost everyone has at least one, have been in our lives for more than ten years, the history of mobile applications and mobile phones is quite old. The ancestor of the smartphones, which we do most of our daily routine work today, has enabled this technology to take place in our lives as classical mobile phones in 1993, with the trials that enabled communication with a one-way transmitter in the Detroit Police Department in America in 1921. Mobile phones with classical Symbian operating systems were developed, and PDAs (Personal Digital Assistants), which we use today, was developed thanks to the mobile operating systems developed in them. The first PDA device is the IBM phone called Simon (HTTPS: mediatrend.mediamarkt.com.tr, 2018).



Figure 2: The First Smartphone PDA Produced by IBM

Source: <https://mediatrend.mediamarkt.com.tr/akilli-telefon-tarihi/>;2018

It is a Symbian operating system with a simple and limited interface developed by the Java company for mobile phones with the development of technology after the Simon device of BM company. The most well-known of the pioneering names of that period, which most of us are familiar with, is the Finnish company Nokia. It has achieved considerable success in the mobile phone market by using the Symbian operating system developed by the Java company in Java Language on its devices. Mobile devices of that day could connect to the internet, send e-mails and even access the internet. However, transactions were carried out with the mobile applications installed as the desired standard. This did not make the devices as attractive as they are today, users still preferred computers for communication. By 2005, the first foundations of today's popular use in the field of mobile devices and mobile applications were laid (<https://www.webtekno.com>, 2018).

These mobile devices are divided into two categories considering the historical chronology. They are simple devices compared to today, which allows the user to make phone calls and text messages with the Symbian operating system written in the Java programming language, the first of which is described as a mobile phone. The second one is the devices that we describe today as smartphones, which have a colourful, three-dimensional touch screen, contain mobile operating systems as well as the operational capability of the mobile phone, and where personalized mobile applications can be installed (Çakır and Demir, 2014).

When looking at the short history of mobility research, it is not possible to find a commonly accepted definition of the concept. In general, the term mobile is understood as the state of being able to move or be moved, and mobility is the ability to provide movement. The mobile can be anything physical or non-physical, tangible or intangible, as long as it moves or is moved. Therefore, mobile and mobility refer to a wide variety of situations and capabilities. Mobility is sometimes used as a physical movement and sometimes as an interaction between people using mobile technology to communicate with each other. Differently, mobility can be defined as the physical movement of people, as well as the remote interaction with other people or the movement of information resources. Cresswell (2006) separates the concepts of movement and mobility and describes the movement as “the act of displacement that allows objects, people and ideas to circulate between locations”.

Kaufmann et al. (2008) used the term spatial mobility by accepting mobility as the movement of people and objects in real and virtual space, expanding spatial mobility further, referring to one-way, irreversible migration or residential mobility, apart from only two-way travel and repeated daily mobility. According to them, spatial mobility should not be limited to the time between the starting and destination points, and should be seen as the structuring of social life and social integration. They also

argue that it is necessary to talk about the social dimension of mobility, it is a very meaningful feature.

Bonns and Kesselring (2001) preferred a social but more restricted definition of mobility: "the human ability to carry out certain projects and plans in motion". They also talked about the new concept of motility² - the capacity to be mobile. This concept, which is defined as the movement capacity of an animal or human organ in biology and medicine, has been interpreted by Kaufmann et al. According to them, motility also encompasses all the factors that define a person's capacity to be mobile (purpose, strategy, preferences, and skills) and can be expressed as the tendency to be mobile, which can vary in intensity from person to person. The difference between movement and motility can also be explained as follows: Movement indicates mobility performance, while motility indicates mobility potential.

Kaufmann et al. (2008) considered mobility in three dimensions: movements, networks and motility, to overcome the limitations and boundaries of the concept of mobility and to make a more comprehensive definition of mobility.

For example, the telephone is also a movement with a starting point and a destination. Not only people but also objects, ideas and information can move. Networks can be defined as a system of movements. Technical networks (transportation, telecommunications, postal etc.) can be defined by the quality of the infrastructure and services and the access conditions of these services. On the other hand, social networks can be characterized as a set of institutionalized relationships. Motility is the social and spatial capacity of people, objects, ideas or information to act. Capacity encompasses any form of access by the individual or group, the skills they have to take advantage of those accesses and what they can do with those skills, as well as the opportunities for action they may or may not find appropriate. Mobility can be seen as a change of state between these three dimensions.

Situations that can occur between these three dimensions are examined below with examples: A person can move without being mobile: Movement in space does not change the person's state. For example, a businessman travelling around the world with conference centres in international hotels is a good example of this situation. Even though it changes geographically, its status does not change. His world of activities is not related to different environments. A person can be mobile even though he is not moving Internet, e-mail or skype users can be given as an example for this situation. A person talking on a mobile phone may be sitting at a table and not in motion, not every mobile is meant to be on the move. The fact that a book reader can go to the world of the characters of the book by imagining also indicates

the state of being mobile without moving. One can be both on the move and mobile: we are talking about both virtual and physical mobility at the same time.

For example, talking on a cell phone while driving. The widespread use of mobile technology, which is considered a telecommunication revolution, has added another meaning to the term mobility. The electronic flow of intangible information, in other words, being mobile, has revealed the concept of virtual mobility. An electronically transmitted phone or e-mail constitutes a virtual extension of the human being in space. Messages sent to many recipients, not just one-to-one, create publicly accessible pieces of mobile information. The information received by the website can also be shown as an example of information mobility, thus virtual mobility.

Urry (1999) termed the virtual flow of information over the Internet as weightless travel and one-way public predetermined transmissions from television as imaginary travel. In the context of social mobility, sociological meanings related to the status transitions of individuals and groups in the social stratum have also been attributed to the term mobility by some scholars. Here, a relationship between social and spatial mobility is mentioned. The increase in social mobility also causes an increase in spatial mobility. The increase in social status brings with it the opportunity to use telecommunication services and to buy a car; therefore, it causes an increase in physical mobility and virtual mobility. On the other hand, wider information and virtual access can mean more physical movement and incentives and opportunities for an increase in social mobility. In other words, the greater the use of telecommunications in a place, the more social mobility there is.

Mobile technologies lead to a reduction in costs and expenses in responding to sudden and competing needs. Realizing many different mobile applications with a single device not only reduces hardware costs but also increases the user's familiarity with the device, its skills and the level of utilization. Location- and time-sensitive jobs are very good candidates for mobilization. Providing information at the point of full efficiency (transferring the right information at the right place and at the right time) increases work efficiency and decision-making efficiency.

One of the conveniences provided by mobile technology is its ease of use. Thanks to the ever-increasing functionality and user-friendly designs of mobile devices, their adoption and spread have been ensured. Mobile phones and portable computers have turned into a visual and public communication tool rather than a means of communication with their eye-catching designs, reduced size, weight, and the addition of many non-communication accessories such as games, calculators, radios, TV and camera.

The other side of the mobility coin, stability, cannot be considered apart from immobility, which can also mean immutability and stability. Mobility and stability, flows and resilience are complementary concepts. (Kellerman, 2006) The development and widespread adoption of mobile technologies has led to scientific research that previously focused on constraints, hierarchy, and shape, shifting to the topics of process, continuous communication, and mobility. Sociologists generally tend to think that movement and dynamism, which are considered new today, are good and old stability is bad, but it should not be forgotten that it is as equal in stability as the value given to mobility and its importance should not be ignored. Some scholars suggest building new social theories on mobility and stability and questioning the current relationship between old stability and new mobility. Today, there is a balance shift between mobility and stability created by the circulation of people and goods, information and ideas, and an example of this change is the disappearance of the traditional distinction between home and work positions, which are considered to be the most basic, with the development of communication technologies. Home and work activities are now intertwined with the use of the Internet and mobile phones. Houses have turned into home offices and the place of residence has begun to be seen as a mobile and temporary location. Some scientists even went further and suggested that cities would also be dissolved.

Urry (2004) states that observations on mobility and fixity point to complex socio-spatial differences, and complex relationships between people and places, in theorizing personal mobility. According to him, places and people are connected by activities, and these activities are carried out intermittently in these physical places. Activities should not be considered independent of places.

Conclusion

The importance of mobility today and the increasing variety and complexity of virtual mobility require that the role of immobility should not be underestimated. Although mobility is dominant in human activities, immobility can also be thought of as the stopping point in the mobile world, in other words, stagnation provides the formation of mobility. “The force of motion and mobility to create a field of flows can only be created by temporary balances.” (Massey, 2005:78) “If space allows movement, the place is also a stop; every stop in the movement allows the position to become the ground.” (Tuan, 1977). Human movements have a starting point and a destination point, and these points are fixed. These indicate immobile locations. For example, the locations of internet service providers and cell phone technology base stations are fixed. Those who provide services in telecommunications or other

sectors that enable people to be physically or virtually mobile can be defined as immobile people.

References

- Agutter, A.J.** (1995). The linguistic significance of current British slang. Thesis (PhD). Edinburgh University.
- Cakir, E.** (2018). Multiple Criteria Decision-Making Methods in Electronic Document Management System (EBYS) Software Selection: A Municipality Example. *Business, Economics and Management Research Journal*, 1(1), p. 15-30.
- Çakır, F., & Demir, N.** (2014). A Study on Determining the Smartphone Purchase Preferences of University Students. *Journal of Dokuz Eylül University Faculty of Economics and Administrative Sciences Vol. 29 No. 1*, p. 213-243.
- Doğan, R. Ö., Kayıkçıoğlu, T., & et al.** (2018). Transfer and Storage of Electronic Health Records Using WCF Web Services. *Journal of Suleyman Demirel University Institute of Science and Technology*, 22(1), p. 232-236.
- Dogrul, G.** (2015). Analysis of Traffic Accidents with Association Rules. *Gazi Journal of Engineering Sciences*, 1(2), p. 265-283.
- Erol, H., & Özdemir, A.** (2014). Evaluation of Health Reforms and Health Expenditures in Turkey. *Journal of Social Security*, 4(1), p. 9-34.
- Ertemel, A. V., & Çudin, D.** (2017). Factors Affecting Smartphone Users' Paid App Purchase Intention. *Istanbul Commerce University Journal of Social Sciences*, 33(1), p. 153-171.
- Göker, H., & Tekedere, H.** (2018). Automatic Evaluation of Opinions on Fatih Project with Text Mining Methods. *Journal of Information Technologies*, 10(3), p. 291-299.
- Guler, E.** (2015). Gamification in Mobile Healthcare. *Journal of Open Education Applications and Research*, 1(2), p. 82-101.
- Holland, M.** (2004). Guide to citing Internet sources (2004) Available from: http://www.bournemouth.ac.uk/library/using/guide_to_citing_internet_sourc.html. Accessed 4 November.
- Ilarslan, K.** (2014). *Journal of Academic Social Studies*. Prediction of Stock Prices with the K-Nearest Neighbor Algorithm, 4(30), p. 375-392.

Işık, A. H., & Güler, I. (2010). Mobile Application Study in Telemedicine and Analysis of Mobile Communication Technologies. *Gazi University Journal of Information Technologies* Volume 3 Issue 1, p. 1-10.

Karataş, G., Akbulut, A., & et al. (2016). Security, Threats and Key Strategies in Mobile Devices. *Istanbul Commerce University Journal of Science*, p. 55-75.

Khashoggi, T., & Gokcen, H. (2014). Determination of E-Commerce Sites with Text Mining. *Journal of Information Technologies*, 7(1).

Kılıç, T. (2017). e-Health, Good Practice; Netherlands, p. 203-217.

Luenberger, D.G. (1973). *Introduction to Linear and Nonlinear Programming*. Addison-Wesley, California.

Ranger, A. T., Usta, E., & et al. (2016). Evaluation of the Graphical User Interface of Android Operating System Software in Terms of Visual Design Principles. *Turkish Journal of Social Research*, p. 781-791.

Rosen, J.B. (1961). The gradient projection method for nonlinear programming: Part II nonlinear constraints. *SIAM J. Appl. Math.*, 9, 514-532.

Tezcan, C. (2016). An Innovative Perspective on Health: Mobile Health. TUSIAD. doi:TÜSİAD-T/2016-03/575

Tufekci, N., Yorulmaz, R., & Cansever, I. H. (2017). Digital Hospital. *Journal of Current Researches on Health Sector*, 143-156.

Uğur, N. G., & Turan, A. H. (2015). Acceptance and Use of Mobile Applications by University Students: Example of Sakarya University. *Journal of Internet Applications and Management*, 2(6), p. 63-79.