MOBILE TECHNOLOGIES

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I. History of Mobile Industry

1. History of wireless communications

- Along with the globalization of business in the 1980s, there was a growth in the communications industry, especially wireless communications.
- Completely local in operation and completely incompatible with their neighbors, the first wireless networks were NMT450 in Scandinavia and Benelux, TACS in Great Britain and C- Netz in West Germany.
- The problem with these First Generation cellular networks is the lack of capacity. In addition , it becomes clear that local solutions of mobile communication developers do not have a good long-term perspective.

1. History of wireless communications

- In 1981, the first mobile connection standard based on the operating system in Sweden and Finland was created and named Nordic Mobile Telephony (NMT).
- In a later stage, the other countries in Europe and also outside its borders are included in this standard. The system is based on Nokia technology. This marked the beginning of the rapid development of the mobile phone industry.
- Appearing in 1981, NMT became the first universal standard for mobile communication.

1. History of wireless communications

- In 1982, the CEPT (European Commission of Telecommunications Operators) decided to develop a specification for a pan-European network for mobile communications.
- In 1985, Italy, Germany, France and Great Britain signed an agreement for the development of GSM (Global System for Mobile communication).
- By design, GSM relies on digital technology (not like previous networks - on analog) operating in the 900 MHz frequency band, allowing more subscribers to use a better connection at the same time.

1. History of wireless communications

- In 1989, the development of the GSM specification was transferred to the newly established European Telecommunications Standards Institute (ETSI).
- ETSI brings together the efforts of operators, administrators and manufacturers, thus accelerating developments.
- The first specification of GSM900 was published in 1990, and of GSM1800 in 1997.
- The first demonstration of GSM capabilities was made in 1991. in Geneva, with over 10,000 calls made.

1. History of wireless communications

- The first problem facing GSM operators is the lack of standardized terminal devices.
- This necessitated in 1992 the introduction of the ITA (Interim Type Approval - an approval document) - a procedure according to which devices must have tested and approved parameters that will not cause problems for networks.
- The birth date of GSM is considered to be the launch of the first commercial GSM networks - this happened in 1992, with operators from Finland, Denmark, Italy, Germany, etc.
- Then the first roaming agreement between Telecom - Finland and Vodafone - Great Britain was signed .

1. History of wireless communications

- In 1994, the Federal Communications Commission in the United States allocated the 1900MHz frequency band and initiated the PCS system.
- The European "family" of GSM is joined by an Australian operator, followed by Asian, African and others.
- In June 1995 GSM Association of 156 members and 12 million subscribers is founded.

2. History of mobile devices

- In 1938, the Canadian Al Gross created a portable radio station, which he called " Walkie- Talkie". It was later used by the US Secret Service.
- In 1946, the Swedish police tested the first prototype mobile phone for communication between coast guard vessels. The technique allows them to make up to 6 calls before the device's battery runs out.

2. History of mobile devices

- The concept of a phone with computer functions was introduced in 1971 by Theodoros Paraskevakos, who patented it three years later.
- In 1971, the Greek inventor demonstrated a transmitter and receiver that enabled new ways of communicating with remote equipment.
- Among them, however, are not present the PDA functions with which we associate smartphones.

2. History of mobile devices

- The first portable commercial telephone was developed by Motorola and was called the Motorola DynaTAC 8000X.
- It was about 30 centimeters long, weighed 900 grams, cost $3995 in the US and appeared on the commercial networks in 1983.
- The battery provided 1 hour of talk time, and its memory held 30 numbers.
- It was with the prototype of such a model that on April 3, 1973, Dr. Martin Cooper produced the first conversation on a mobile device. Cooper calls from the Motorola plant to his competition at the Bell Company to tell them that he has invented the cell phone.

Motorola DynaTAC 8000X

2. History of mobile devices

- On November 10, 1992, Nokia launched the first commercial GSM phone. The Nokia 1011 model weighs nearly half a kilogram, and the battery provides only one day of operation.
- The model supports the function of exchanging text messages. The Nokia 1011 measures 195 x 60 x 45 mm, while currently the thinnest phone is less than 6 mm thick.
- With its 475 grams, the Nokia model falls short of today's GSMs, which weigh from 50 to 150 grams.
- The main culprit for the huge weight difference is the 1011's nickel-cadmium battery, which provides about 90 minutes of talk time and 12 hours of standby time.

2. History of mobile devices

- The Nokia 1011 operates on the 900 MHz frequency used by British operators Vodafone and Cellnet (O2).
- The device has a large external antenna, and the phonebook holds information for only 99 contacts.
- From the distance of the time, 1011 looks very limited - no digital camera, Bluetooth and card slot, but it offers one of the most popular services at the moment - the exchange of text messages, although these are not exactly SMS.

Nokia 1011

2. History of mobile devices

- The history of smartphones began in the USA also in 1992.
- Then, for the first time, IBM presented a mobile device that combined voice communication with a calculator, a contact book, as well as programs for sending e-mail and writing short text files.
- It equips the phone, whose model name is Simon , with a touch -screen .
- It weighs about 600 grams and costs $900.
- It was launched in 1994 and sold 50,000 units in six months.

IBM Simon

2. History of mobile devices

- The first appearance of the term "smartphone" in a printed edition dates back to 1995. American mobile operator AT&T uses the term "smart phone" to describe the PhoneWriter Communicator product.
- Nokia entered the smartphone market in 1996 when they introduced the Nokia 9000 Communicator, a PDA-enabled phone with an operating system. The phone is a thin box - when opened, you can see a screen at the top and a QWERTY keyboard at the bottom. It allows sending email and supports applications such as calculator, address book, fax and more.

Nokia 9000 Communicator

2. History of mobile devices

- In June 1999, Qualcomm presented the CDMA Digital PCS Smartphone - a mobile device with PDA functions and Internet access.
- In the early 2000s, Ericsson Mobile Communications presents the Ericsson R380 - the first device to be marketed as a 'smartphone'. The phone has a resistive touchscreen, allows limited internet browsing and is operated with a stylus .

Ericsson R380

2. History of mobile devices

- At the beginning of the new century, the mass popularization of smartphones began, albeit among a limited group of users - mostly businessmen. In Europe in the first decade of this century, the most popular operating system is Symbian, developed by Nokia.
- The iPhone was introduced in 2007 by Apple. It is the first smartphone with a large screen that is operated with fingers instead of a stylus .
- The first smartphone using the open source Android operating system - the work of Andy Rubin - is called the HTC Dream. In the beginning, the popularization of Android is slow, but over time, the platform gradually began to dominate the mobile market.

2. History of mobile devices

- At the end of 2013, the QSAlpha company presented the first smartphone designed for security, data encryption and identity protection.
- In December 2013, Samsung and LG presented the first smartphones with curved OLED screens.
- At the beginning of 2014, smartphones began to use screens with Quad-HD resolution (2560 x 1440 pixels in a 5.5-inch screen at a pixel density of up to 534ppi).
- In 2014, the first concepts of a modular phone began to appear, the functions of which will be divided into physical modules - easy to replace and offering complete freedom to the user in their configuration.

The evolution of mobile devices