# History of Technology

## Pocket Supercomputer: Steady Improvement of Chip Technology

Smartphones: These are computer, telephone, MP3 player, Navigation equipment and many more. Possibly this makes the steady progress of chip technology. Gordon Moore formulated in 1960 that law which since then pushes on progress of semiconductor technique. About every 18 months the efficiency of chips is doubled as the case may be and correspondingly their size and prices are also being reduced. That this law today is known to the engineers attached to manufacturers and has a simple basis. All the progress of the chip-technique knocks down more or less distinctly also in that production which are prepared with these chips. Example Cray-2 the fastest supercomputer at that time in the year 1985. The computer was distinctly about $1m^3$ big, weighed 2.5 tons inclusive of fluid cooling medium and had a computing efficiency which lies in the dimension of iphone 4 of Apple. That appeared in the year 2010 was smaller than 10 mm thick and weighed 137 gms. Griffiger could hardly present that in 25 years of technique development of computer to smart-phone.

Actually it is so a smartphone is an impossible product. It unites in a few cubic centimeters a mobile telephone, navigation systems, digital camera, MP3 player, pocket computer, FM radio, electronic notice book and an efficient computer and naturally the storage batteries which supply current for all possible purposes for a long time. Alone the diverse mobile telephones, WLAN and Bluetooth make the radio communication which is always the new assignment of the development engineers. Therefore the modern smart phone must be able to serve along with the newest LTE radio links with the requirements also the old partly in land specific well pronounced differing standards UMTS, GPRS, GSM and more.

Chip manufacturers who address in this area are specialists like Skyworks or Broadcom which were previously unknown outside the scheme. However also the chip prime body Intel here plays a role, after the Californian have taken on the radiochip parts from Infineon at the end of 2010. Again the radiochips of chip world market leaders like the experts of market research undertakings HIS have discovered after the analysis of hardware sticks to the up-to-date iphone 7 after six years of absence. Wayne Lam of HIS comments that so. Cut off in LTE market for a long time, Intel has again in the iPhone started work. That is a huge success, when it will not present also in a short time any big financial success. Then regarding total material cost of an iPhone 7 from approximately according to IHS 21980 dollars it makes total chips for the mobile phone finally 33.9 dollars. These come down from in total five offerers

(With further 8 dollars the components knock down for WLAN, Blue tooth and the satellite navigation).

The real heart of smartphone whose application processor (AP) cost US $ 26.90 represent displays according to HIS with 43 US $ the biggest individual position in the material list. In this case, there is one Apple owned design named AIO with four cores based on a design of English processor designer ARM.

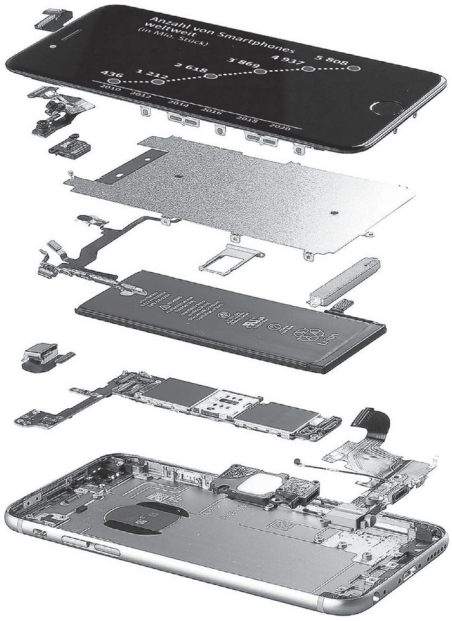
Similarly as in the 1990s during the PC booms, today the central processor of smartphone stand in focus of marketing strategies and with that also the buyer. They determine certainly not alone on the total performance of an instrument but also they are to communicate handy in their data. So as Intel dominate the market of PC processors and on that rose to the world exporter before 25 years, it has shifted itself with the smartphone processor QUALCOMM in the last years to a leading position. The undertaking out of Californian San Diego has its root in chips for the mobile communication and also there at the summit. In the top ten of the world's biggest chip manufacturers it has come to the third position in the meantime. The market researcher of strategy analytic specified the AP total mark in 3 quarter 2016 with 6.1 billion US $. Out of the Qualcorn holds a portion of 35% following Apple and to the Taiwanese chip manufacturer Mediatek which almost catch up overtake in delivered number of pieces the US rivals.

Otherwise as for example Intel arranges many offers of chips for smartphone not over one own chip production. They leave the service of the so-called foundries which manufacture chips according to the customers' design. In the initial years these models from established chip manufacturers previously were laughed at. The legendary remark of AMD founder Jerry Sanders, "Right persons have factories". The success of the factoryless offerers in the last year has also made factories to remarkable leader. According to the market researchers of IC Insights produced market exporter TSMC chips for almost 30 billion $ that is almost 9% of world market of chips. The second positioned Global foundries follow with 56 billions of $.

Beginning February Global foundries announced further billions of $ investment in its production stations under that Dresden. Then in the semiconductor technology foundries must also stand at the summit of the progress, when they want their customers to participate in the advancement of Moore's Law. Therefore the smallest and most modern chip structures stand at the disposal of the component suppliers of the smartphone. These make their chip with every generation for the time being, quicker more efficient, smaller and cheaper on things energy and

Strategy Analysts expect a yearly growth of AP market of 2.1% on 25.3 billion of US $ for the years from 2017 to 2022. However that is only the economical side of the medal but the technical progress is otherwise. Therefore around 14% of the processors with structures of 10 nm should be produced by 2017 which for the present time up-to-date stage of Moors' Law. To that the Anguren expect steadily more functions which are integrated in the chips 4K-video and new radio-standard as LTE advanced and 5G.

In a total other sports league the components play which first render possible the many functions of modern smartphones. The spectrum stretches beginning from the acoustic sensors microphone and upto barometric pressure sensors. Special semiconductor techniques come here as insertion which link together the microelectronics and micromechanical elements. One of the leading offerers is German Bosch Sensortech. For the up-to-date iphone the Reutlingen firm regulates the barometric pressure sensors according to HIS.



**Mobile facts**

- The biggest smartphone displays at present possesses a projection screen diagonal of 7 inches, therefore a little short of 18 cms. The smallest one having a diagonal display of 3 inches.
- A smartphone weighs at present between 91 gms to 283 gms. At the beginning of mobile phone era the standard handy, the Knochen of Motorola was more or less 800 gms.
- The present storage battery capacity of smartphone spans from 1000 mAh to 5000 mAh. According to use frequency, the lifespan of a battery may be possible for seven days.
- 17 years after the appearance of Nokia 3310 it is speculated in a new edition. At that time it was the most purchased Handy worldwide and tipped with longer battery life, small weight, and stable container.
- 5.8 milliard smartphone should exist worldwide after the international mobile phone organization GSMA in 2020. In comparison to 2015, there is a growth of 2.6 milliard instruments.
- In 2020 according to GSMA the smartphone users worldwise should cause on an average 7 G Byte at data coming into per month.
- One compares the employment number which comes out of the mobile ecosystem, the employment position worldwide will increase from 17 million in 2015 to 20 million in 2024.
- 63% of the smartphone users in Germany expect according to Bitcom study for their next smartphones longer life of storage batteries. 36% given bigger importance on cameras with improved quality, 35% desire to make eyes at with more storage capacity and 23% with more computing efficiency and 19% with each one with bigger display.

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