Wireless communication

The revolution of wireless communication industry gradually was inching up the spectrum with transition from long and strong wavelengths towards wide and weak bands of shorter wavelengths. Mobile phone services have transited from the 1950s radio systems using low FM frequencies near 100 megahertz, to the 1960s spectrum band of 450 megahertz, to the present cellular band of 900 megahertz, accommodating about 10 million cellular subscribers in the US. During 1990s such trend accelerated sharply, accommodating about hundreds of millions of users around the world, cellular communications become digital entailing huge increment in the cost effectiveness of communications in accordance with the laws of Shannon. Normally, the new rule of radio is the shorter transmission path, the better the system. Similar to the transistors on semiconductor chips, transmitters are more efficient when they are packed together more closely.

(Glider, 1993)While Peter Huber writes in his masterly new book, The Geodesic Network 2, the new regime is in support of the ‘ geodesic networks’ with the radios most intimately linked in tiny microcells. In accordance with the law of the microcosm, the lesser is the space, the more the room. This rule shifts the conventional wisdom of microwaves to be the upside down. Even if it is true that microwaves are not capable of penetrating most buildings and other obstacles, with lots of small cells it is not necessary that the waves penetrate walls to the adjacent offices. The microwaves necessitate high power systems to transmit, but only when you necessitate to send them long distances.

The wattage at the receiver falls off in the ratio to the fourth power of the distance from the transmitter. Decreasing cell sizes while we move up the

spectrum lowers power necessities far more than higher frequencies raises them. Mobile systems are also required to be small and light. (Glider, 1993) According to the law of telecosm, higher is the frequency and the shorter the wavelength, the wider the bandwidth, the smaller becomes the antenna, the slimmer the cell and finally, the cheaper and better the communication. The functioning of this law will become outdate the entire ideology of scarce spectrum and will infuse an era of advances in telecommunications comparable to the recent gains in computing.

The revolution in the computer and phone industries, the integration spirits of Maxwell, Shannon and Shockley even entail a grave mark to the present revolutionaries in cellular telephony. Many have been very optimistic about the impact of wireless on the computer industries. But some visualized that such impact will be dwarfed by the impact of computers on wireless. In personal communications networks — PCN, the cellular industry is about to experience its own personal computer revolution. (Glider, 1993) Much before it was visualized that the personal computer will lead to systems thousands of times more efficient in MIPS per dollar than the main frames and mini computers, the Personal Communications Networks will bring an exponential plunge of costs. Such networks will entail an exponential plunge of costs.

Such networks are to be based on microcells, normally quantified n terms of hundreds of meters in stead of tens of miles and will interlink smart digital appliances, draining power in milliwatts instead of dumb phones using watts. Cellular phone will evolve to become the world’s most pervasive P. C. Under the pressure from EEC industrial politicians functioning with the guidance of engineers from Ericsson, the Europeans introduced a new digital cellular

system in the name of Groupe Speciale Mobile — GSM. GSM is conceived of as a traditional digital system that multiplies the number of users in each cellular channel by a factor of three and applies an access method known as time-division multiple access — TDMA. (Glider, 1993) The Steinbrecher’s system proved the base for a radical new regime in distributed wireless computer telephony.

The CDMA technology developed afterwards attracts the similarities between noise and information. The system started in the military as an effort to dissuade jamming or air tapping of combat messages. Qualcom entails CDMA the challenge of communications on the battlefronts of big-city cellular. The trend of wireless communication appears to be boundless bandwidth to be achieved through the Shannon approach of the wide and weak signals, transiting to ever smaller cells with lower power at higher frequencies.

In this manner it has since been visualized that the next decade will see the emergence of fortunes in ever changing transmutations of PCN, digital video, multimedia and wireless computers that undermines the yields of cable and cellular. (Glider, 1993)