HUMAN AND TELECOMMUNICATION TECHNOLOGIES LIFE CYCLES COMPARISON

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Annotation: Main stages of human life cycle are described. The human and telecommunication technologies life cycle's comparison is done. The general approach to the consideration of telecommunication technologies life cycle is shown. Also the paper shows that the overall picture of telecommunication technology development can be obtained only with an integrated approach to the issue. Only a combination of methodological, statistical approach and development of the standardization process will provide effective assessment, required by companies for development the industry.

Keywords: life cycle, live cycle stages, telecommunication technologies

Keywords classification of ACM: C. Computer Systems Organization D.2.9 Management (K.6.3) Life cycle.

Introduction

Nowadays, a lot of attention is paid to study the behavior of processes and objects throughout their life cycle. The term life cycle is defined as a set of processes and stages of living nature organism's development, of technical systems, products from the birth, prior the termination, or the end of their use. Graphic representation of the life cycle [Konovalov, 2011] is dome-shaped, consisting of two more or less symmetrical monotonic curves. One shows ascent or becoming the system. Another - the decline and degradation, old age and death. The middle part of the cycle - a relatively gentle transition from one development area to another associated with the maturity of the system when it has a maximum capacity, viability and sustainability.

Big efforts aimed for studying the living organisms and humans life cycle. There are different approaches to the definition of the human life cycle, but most of them can be described as follows: birth, infancy, childhood, adolescence, youth, maturity, wisdom, old age and death. However, mankind has not stopped on the study of living organisms only, and brings his knowledge to other areas of science and technology. In each of the areas appears its lifecycle. The sphere of telecommunications is not an exception. Telecommunication operators need to adequately perceive the new technologies expectations within their industry, choose moderate or aggressive approach to their implementation, combined with investment risk, the need to understand the costs and benefits of getting the introduction of new technologies for the successful operation. To do this, operators need an understanding of the technology life cycle and assess their development stage.

The general approach to the consideration of telecommunication technologies life cycle

Telecommunication operators need to pay attention to four aspects to take the necessary decisions on the technology development. The first aspect - understanding general life cycle of technology, the second aspect - the definition of the current stage of technology development, in which there is an interest, a third aspect - is the collection and processing of statistical data for the technology introduction, and the fourth aspect - forecasting the number of technology users, based on the collected statistics. Consider these aspects in detail.

One of the steps of understanding technology life cycle is the collection various kinds statistical data of specific technology and further analysis of the processing data in different sections. For example, in 1995, a consulting

company Gartner Inc (NYSE: IT), a world leader in the study of information technology, has introduced the concept of Hype cycle (cycle technology maturity). The essence of the concept is that each technology passes the same stages during its existence. These stages are as follows (Figure 1): "Technology Trigger" (the appearance of innovation and articles in the press), "peak of inflated expectations" (waiting for the new revolutionary properties), "trough of disillusionment "(identification of gaps in technology, disappointment), the "slope of enlightenment " (implementation in large companies), and the" plateau of productivity "(maturity of technology, the use with the knowledge of all the positive and negative characteristics).

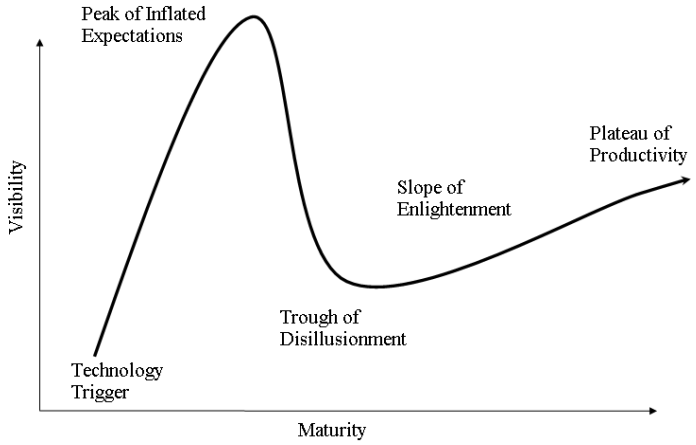

Figure 1. Hype cycle graph

At the time of analysis each specific technology is at some point of its development. Gartner has been working on the collection and aggregation of data from the time of its creation, and gained a considerable amount of statistical data for the analytical predictions. Hype Cycle of new technologies from one of the reports of the company, which was published in Forbes magazine in September 2012 [Hung LeHong, Jackie Fenn, 2012] is presented in Figure 2.

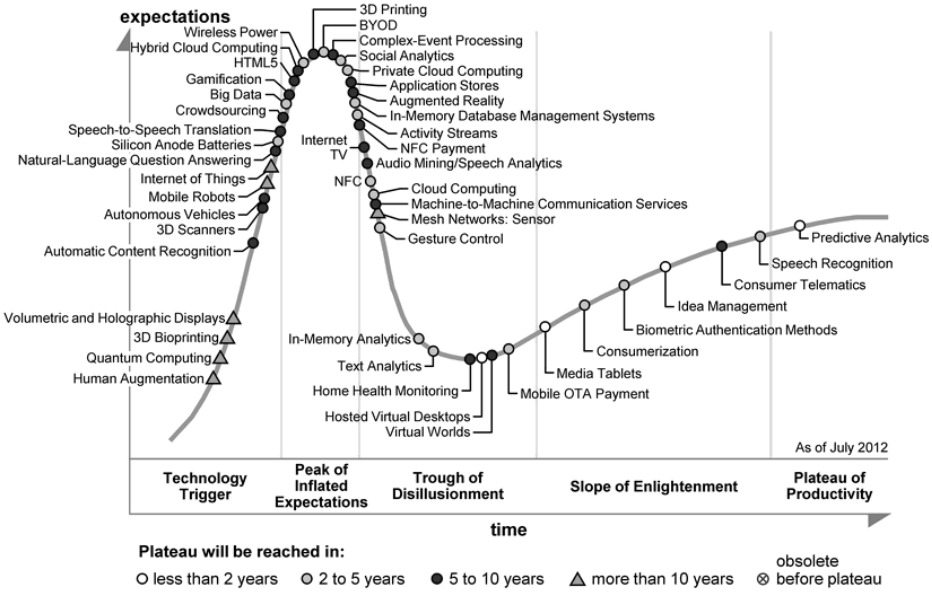

Figure 2. Gartner's 2012 Hype cycle for emerging technologies

This graph - an attempt to show the current state companies of the industry and make a forecast for the latest information technology. Comparison of different technologies - a rather difficult task. Because it makes sense to compare technologies for identical solutions or very similar tasks. On Figure 3, which is taken from the website of the company "Eurasia Telecom" [Sokolov, 2004] the points of some telecommunications technologies for the real conditions are marked. The results of this comparative evaluation will have practical interest only if technology includes all the features of the network in which they operate, so the comparison of technologies appropriate to carry out the specific conditions of each country.

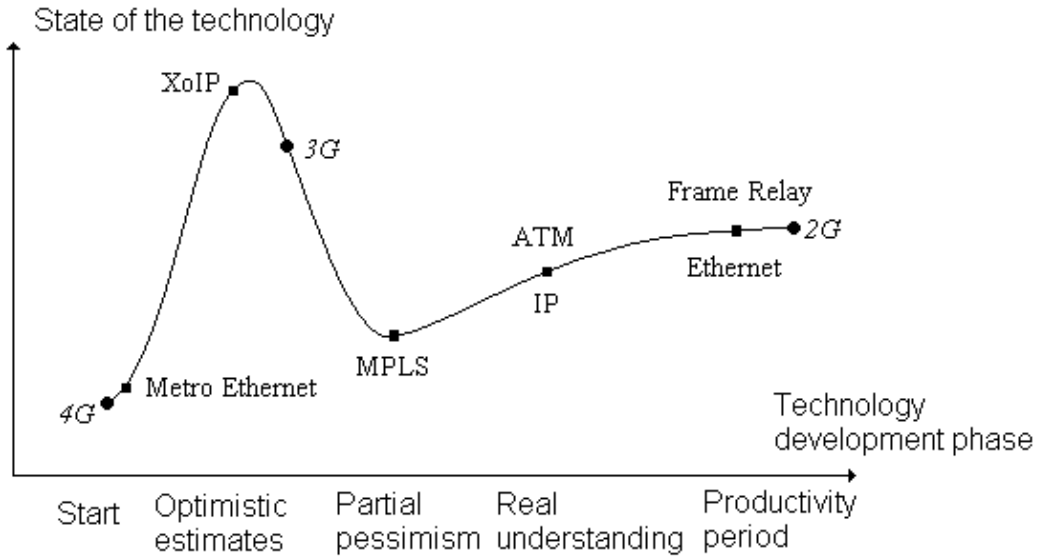

Figure 3. Hype cycle for emerging technologies by "Eurasia Telecom"

Conditions of Ukraine can obtain results that are significantly different from the characteristics of the development of technologies in Western Europe and the U.S., they also need to be interpreted taking about the realities of our country. Completely different conclusions and recommendations on the feasibility of certain technologies can be obtained in result. In this connection there is the problem of studying statistics, determining the life cycles of development of information and communication technologies in Ukraine.

Figure 4. Gather's Magic Quadrant

The concept of Hype cycle gives a necessary vision the condition of the particular technology in specific conditions, especially at the beginning of its development. But for decision to implement this technology, you must also understand the ability the equipment suppliers to provide the necessary services and to have the information about the major players in the market. Gather Inc. developed the approach (Figure 4) called the "Magic Quadrant" for this. This approach is based on an assessment of 2 options: "ability to execute" and "completeness of vision". The first parameter is a generalized assessment of such factors as vendor's financial viability, market responsiveness, product development, sales channels and customer base. The second parameter consists of the evaluation of innovative solutions the company, its views on the current development of the market. This approach, based on a common set of criteria for all technology providers, helps to choose the most successful and competitive company. For clarity, results are displayed using two linear scales that correspond to the parameters. Each provider is applied to the scale where "leaders" have positive scores, and "niche players" are negative. Using these two approaches allows telecommunication operators to evaluate the cycle maturity of the technology in part, its current status, and decides the need and timing of its introduction. If the technology is already at the stage of the "plateau of productivity" according to the Hype cycle graph then there is the problem of estimating the timing of life technology. For this it is necessary to collect statistical information about its use. An example of statistical data needed for use of this approach is shown in Figure 5.

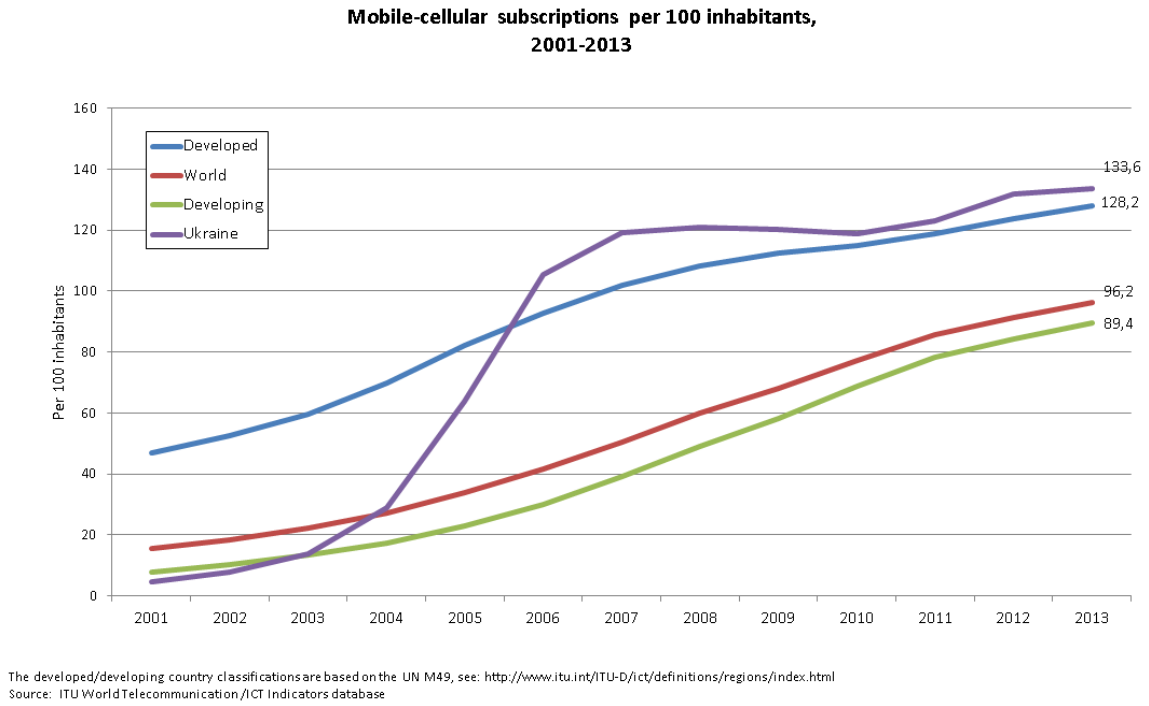

Figure 5. The density of mobile users (2G)

This figure reflects the density of mobile technology GSM users for the period from 2001 to 2013. The figure contains four graphs describing the density of mobile technology GSM standard users for developing countries, for developed countries, for all countries of the world and for Ukraine. As you can see the development of GSM technology in Ukraine matches with the global values at this moment. If we compare this graph with the Hype cycle graph, you can determine that the development of GSM technology for Ukraine is at the upper limit of the "plateau of productivity", which is also confirmed by Figure 3, and see that technology gradual extinction will

begin soon. Such analysis enables network operators to estimate the trends in technology for the country and compare them with the world and determine the stage of their development.

The next aspect in understanding the life cycle of technology is to predict the density of users. The predicted resulting values will evaluate the need to continue the use of a particular technology or its out from service.

Another step towards the understanding lifecycle process, and in particular telecommunications technology, is an attempt to standardize their life cycle. Since the implementation of technology can be hardware, software or hardware and software, the existing standards, dedicated to telecommunication technologies, can be dividing according to this principle. Those standards became high development that governs the life cycle of software (more than 20 standards). The most significant of these are the standards ISO / IEC 12207:2008 System and software engineering - Software life cycle processes, ISO / IEC 15288:2008 System and software engineering - System life cycle processes, IEEE 830-1998 Recommended practice for software requirements specifications. These standards describe the life cycle of software development, and can be used to confirm the stage of development of telecommunication technology, if its implementation involves the development of software.

The main focus is on international standardizing organizations while making description of life cycle for telecommunication technology and its hardware implementation. So European Telecommunications Standards Institute (ETSI) devoted a special technical report ETSI TS 103 199 V1.1.1 (2011-11) for this issue. The methodology of life cycle assessment is described in details in this report for various telecommunication technologies. The standards governing environmental aspect in the life cycle technology received the most development. This is standard ISO 14040:2006 (Environmental management, life cycle assessment, the principles and framework), this is the ISO 14044:2006 (Environmental management, life cycle assessment, requirements and guidelines). In 2011 ETSI published the standard ETSI TS 103 199 Life Cycle Assessment of ICT (Life cycle assessment of information and communication technologies). While these standards have an environmental focus, they are fairly well describe the entire process from creating materials for the production of telecommunication equipment to the withdrawal of equipment from use and the consequences for the environment. These documents have a complete description of the process of creating equipment for existing technologies, and can be used for new ones.

With the approaches proposed in analyzed documents the team of authors is working on the development the method of life cycle assessment of telecommunications technology for the conditions of Ukraine and its application to the research process of these processes and providing prognostic estimates for our country. Some results of these studies will be presented in the report.

Conclusion

The mankind's aspiration for cognition the living organisms and itself, for definition the life cycle passed on other areas of science. We need the understanding what stage of development we are, and what stage of development is for technologies that we create. This understanding is necessary for our success existence. If we talk about the technical field, in particular for telecommunications technology, the understanding of the life cycle and stages of their development is necessary for successful functioning of all the companies working in this field. The paper shows that the overall picture of technology development can be obtained only with an integrated approach to the issue. Only a combination of methodological, statistical approach and development of the standardization process will provide effective assessment, required by companies for development the industry.

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