Research Paper Computer Science

Selected Ict Future Trends and Their General Impacts

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ABSTRACT

The article deals with new future ICT Trends and their implicationsincluding Mega-integration, RFID, Limitations of the Artificial Intelligence and Data Protection.

KEYWORDS | ICT Trends, RFID, Mega-integration, Artificial Intelligence, Data Protection, Computer feudal Monarchy

INTRODUCTION

In his brilliant movie SIMONE (2002), French film director A. Niccol describes how a film director, disgusted by unreliability and financial demands of celebrities, secretly uses simulation software SIMONE. Virtual actress is soon becoming a megastar. After extraordinary success of her film, the director deletes this software. He is then arrested and accused of murder with police explanation: we have been monitoring your bank account for long time and there were no honorariums paid to the megastar from your side…

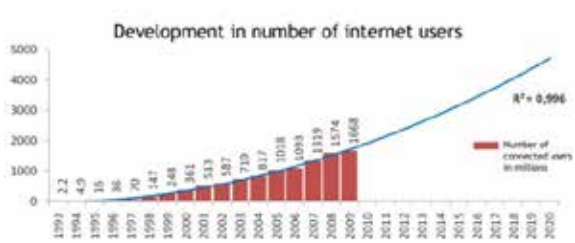
Interesting question is if, in the future, we all will not be manipulated by virtual reality and monitored and controlled to the smallest details by software programs as a consequence of computer, medial, telecommunication, legal, energetic, governmental and other mega-integration.

1. ICT future trends

In the future, every individual, legal and biological object will probably have its own IP address and will be equipped with a control RFID chip.

Let's have a look at the new phenomenon Internet and RFID in some details. The development of the Internet can be demonstrated by a simple extrapolation as shown in the diagram on Fig. 1, although this is most probably a pessimistic prognosis:

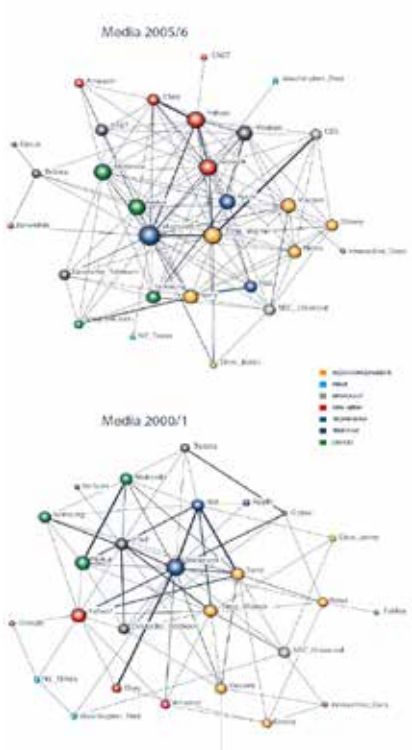
Fig. 1. Development in number of Internet users. Global numbers.Number of people connected to the Internet in millions



Source: author

Based on present statistical data, the Internet can be, in a biological aspect, characterized as expansive, key and an autochthonous biological species that is enlarging its territory into all areas by the activity of civilization so as anthropophile biological species. Another way of describing it can be found in physics and astronomy: Step by step the Internet places all information transfers into its own structure by its gravity. Intensive integration of computer, telecommunication, energetic, medial, social, legal and institutional nets into one homogenous mega complex with many important epiphenomena and secondary effects especially in the sphere of medias is in process at present (2010). Link analysis between the biggest and the most important entities in the area of telecommunication, medial and IT companies (TMT) was processed at the ***Future of Media Summit*** conference in 2006. Companies involved in this analysis were chosen on the basis of their recognized positions in ***Forbes Global 2000*** magazine. By comparing both diagrams shown in Fig. 2, it is obvious that these markets are considerably linked and in the process of intensifying their links.

Fig. 2. Network of strategic alliances, partnerships and joint-ventures among media, telecom and technology companies.



Source: Future of media report 2006

3. Limitations of the Artificial Intelligence

Interactive artificial intelligence will no doubt improve but there are still significant limitations of artificial intelligence that baffle kids who expect more. Eight-year-old child, Harper, got her hands on a new iPhone 4S, and that's when trouble started. Within minutes, she grew impatient with Siri after posing some queries to Apple's speech-recognition "assistant" feature: "Can you pronounce my mother's name?" "Where do I live?" and "Is there dust on the moon?" –questions, she did not assume the artificial voice wouldn't answer. As it failed, delivering replies such as "Sorry, I don't know where that is," Harper became increasingly irritated, until she loudly concluded, "Siri, you're stupid!" It responded "I'm doing my best."

Mathematical considerations show that despite technological improvements – not only in the field of telecommunications – there will be general limitations on AI, in relation to the so-called logistic function.

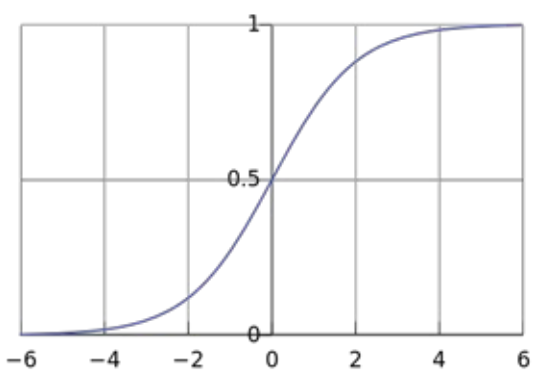
A logistic function or logistic curve is a common sigmoid curve, given its name in 1844 or 1845 by Pierre François Verhulst who studied it in relation to population growth. A generalized logistic curve can model the "S-shaped" behaviour (abbreviated S-curve) of growth of a population ***P***. The initial stage of growth is approximately exponential; then, as saturation begins, the growth slows, and at maturity, growth stops.

A simple logistic function may be defined by the formula

$$P(t) = \frac{1}{1 + e^{-t}}$$

where the variable ***P*** might be considered to denote a ***population***, where ***e*** is Euler's number and the variable ***t*** might be thought of as ***time***. For values of ***t*** in the range of real numbers from $-\infty$ to $+\infty$, the S-curve shown is obtained. In practice, due to the nature of the exponential function e^{-t}, it is sufficient to compute ***t*** over a small range of real numbers such as [–6, +6].

Fig. 3.Logistics function



Source: author

The logistic function finds applications in a range of fields, including telecommunications networks growth, artificial neural networks, biology, biomathematics, demography, economics, chemistry, mathematical psychology, probability, sociology, political science, and statistics.

Let's demonstrate the logistic function on an example in the field of the Artificial Intelligence: the development of the Computer Chess, which can be presented by the following timeline:

In 1947, Alan Turing specified the first computer program for chess.

In March1949, Claude Shannon (1916-2001) described how to program a computer and a Ferranti digital machine was programmed to solve mates in two moves. He proposed basic strategies for restricting the number of possibilities to be considered in a game of chess. Shannon was an avid chess player. He first proposed his idea of programming a computer for chess at the National Institute for Radio Engineers (IRE) Convention in New York.

In 1950, Alan Turing wrote the first computer chess program. The same year he proposed the Turing Test that in time, a computer could be programmed (such as in playing chess) to acquire abilities rivalling human intelligence. If a human did not see the other human or computer during an imitation game such as chess, he/she would not know the difference between the human and the computer.

In 1963, the world chess champion Botvinnik predicted that a Russian chess playing program would eventually defeat the World Champion.

In 1977 the International Computer Chess Association was founded.

In 1990 World Champion Anatoly Karpov lost to MEPHISTO in a simultaneous exhibition in Munich. MEPHISTO also beat grandmasters Robert Huebner and David Bronstein. MEPHISTO won the German blitz championship and earned an International Master norm by scoring 7-4 in the Dortmund Open.

In 1992 Kasparov played Fritz 2 in a 5 minute game match in Cologne, Germany. Kasparov won the match with 6 wins, 1 draw, and 4 losses. This was the first time a program defeated a world champion at speed chess.

The 14th World Microcomputer chess championship was held in Jakarta in October, 1996. It was won by SHREDDER, followed by FERRET.

On May 11 1997, DEEP BLUE defeated Garry Kasparov in a 6 game match held in New York. This was the first time a computer defeated a reigning world champion in a classical chess match. DEEP BLUE had 30 IBM RS-6000 SP processors coupled to 480 chess chips. It could evaluate 200 million moves per second.

The 9th World Computer Championship was held in Paderborn, Germany from June 14, 1999 to June 19, 1999. The winner was Shredder. This was also the 16th World Microcomputer Chess Championship, won by Shredder.

From January 26 to February 7, 2003, Kasparov played Deep Junior 7 in New York. The match ended in a draw. Kasparov won game 1. Deep Junior won game 3. The rest of the games (games 2, 4, 5, and 6) were drawn. This was the first time that a man/machine competition was sanctioned by FIDE, the World Chess Federation. Deep Junior took 10 years to program by Tel Aviv programmers Amir Ban and Shay Bushinksy. It can evaluate 3 million moves a second, and positions 15 moves deep.

On November 11-18, 2003, Kasparov played X3dFritz in New York. The match was tied 2-2. Fritz won the second game. Kasparov won the third game. Games 1 and 4 were drawn. It was the first official world chess championship in total virtual reality, played in 3-D.

The 11th World Computer Chess Championship was held in Graz from November 22 to November 30, 2003. It was won by Shredder after a play-off with Deep Fritz. 3rd place went to Brutus, which evolved into Hydra.

In 2003 the top chess computers were Shredder 7.04 (2810),

Shredder 7.0 (2770), Fritz 8.0 (2762), Deep Fritz 7.0 (2761), Fritz 7.0 (2742), Shredder 6.0 (2724), and Chess Tiger 15.0 (2720).

In 2004, Hydra defeated GM EvgenyVladimirov with 3 wins and 1 draw. It then defeated former FIDE world champion RuslanPonomariov (rated 2710) in a 2-game match, winning both games.

In June, 2005, Hydra beat Michael Adams, the 7th ranked chess player in the world. Hydra won 5 games and drew one game.

Despite such impressive results, applications of logistic curve model presents that limitation in regards to computer chess is around ELO 3100 and this is approximately 20% higher than the best human chess players. In conclusion, after summary of the above results, it becomes clear that artificial intelligence will not be „all-knowing" and „all-wise", but only „ cleverer to a limited extent" than a human being.

4. Cyberspace managers in the 2030

Takingintoconsiderationtheaforementionedinformation, itbecomesobviousthatthisdevelopmentwilllead to newmanagerialpositions in thefuture. Let usbrieflyintroducesomethat are likely to appear:

- The identity managerwilloperate in the area of data protection and relatedlegalrestrictions. Itwillbenecessary to identify, whetherthe business partneris a humanbeing, a robot or a segment ofthebiosphere. A newscientificdisciplinerelated to identity willbedeveloped.

- The Chaos Manager: newinventionslike Internet ofThingswillcomplicatethewholesystem. Specialprogramslikeneuralorgenetic software willbeessential to specifynewgaps in the market.

- E-governmentmanager and Technostressmanagerand many others…

CONCLUSIONS

The above facts demonstrate thatthe continuing high concentration of integration of all networks will also lead to the necessity to strengthen also the powers of personal data protection authorities. Without these and other judicial measures, the future mega-integrated single computer system will be reflected in the political sphere of the next decades by a computer feudal monarchy controlling the entire movement of the society through mobile telephony, RFID and other sophisticated segments of the technosphere.

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