FROM THE REVOLUTION IN COMMUNICATIONS AND COMPUTING TO THE REVOLUTION IN EDUCATION AND NATIONAL DEVELOPMENT

Prof. Alexander Anopriyenko

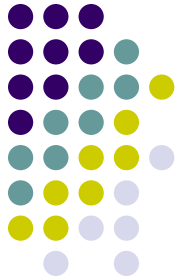
Donetsk National Technical University
UA-83000, Artema, 58, Ukraine
anoprien@cs.dgtu.donetsk.ua
http://donntu.edu.ua

Covenant University
January 29-31, 2007

The plan of the lecture

1. **Brief history of revolutions in communication and education**
2. **The time of 3G GSM, mobile computing and Internet**
3. **Preparing for Change**

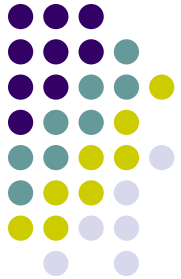
Brief history of revolutions in communication and education



Modern revolution in communication has **a very deep roots**:

- Most ancient revolution in education was more than **20 thousand years ago**: it was invention of so called monologic and monocode in designing early mobile simulation tools (it is one of the themes for tomorrow lecture)
- The second revolution was the invention of **writing 5 thousand years ago**.
- The third revolution was **1 thousand years** ago: first universities was born on that time with libraries for students and teacher.

Brief history of revolutions in communication and education

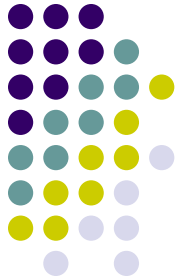


4. The fourth revolution was the invention of **book printing 500 years ago**.
5. We have now **the fifth revolution:**

   Internet + mobile computing

All this revolutions are the **various steps toward globalization and new quality of education**

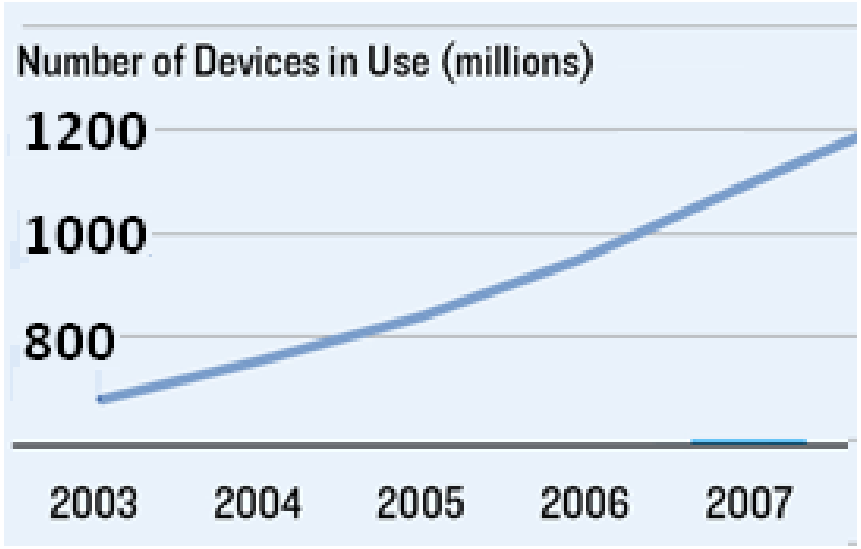
Mobile Computing: Definitions

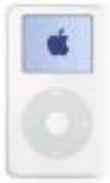


- ***The use of a portable computer capable of wireless networking*** (Forman, 1994)
- *A generic term describing your ability to use technology to wirelessly connect to and use centrally located information and/or application software through the application of small, portable, and wireless computing and communication devices* (Wikipedia)
- *Being able to use a computing device even when being mobile and therefore changing location. Portability is one aspect of mobile computing* (MobileMan)
- *A new paradigm of computing, in which users carrying portable devices have access to data and information services regardless of their physical location or movement behavior* (Jin Jing et. al, 1999)

Devices for Mobile Computing

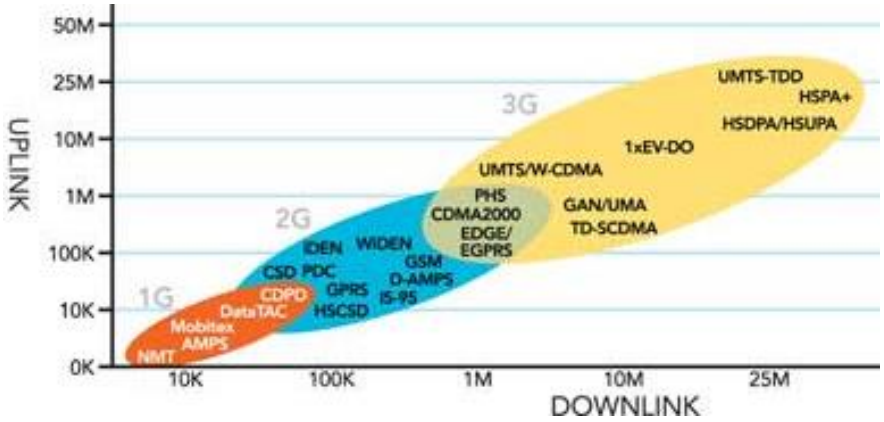
Various:

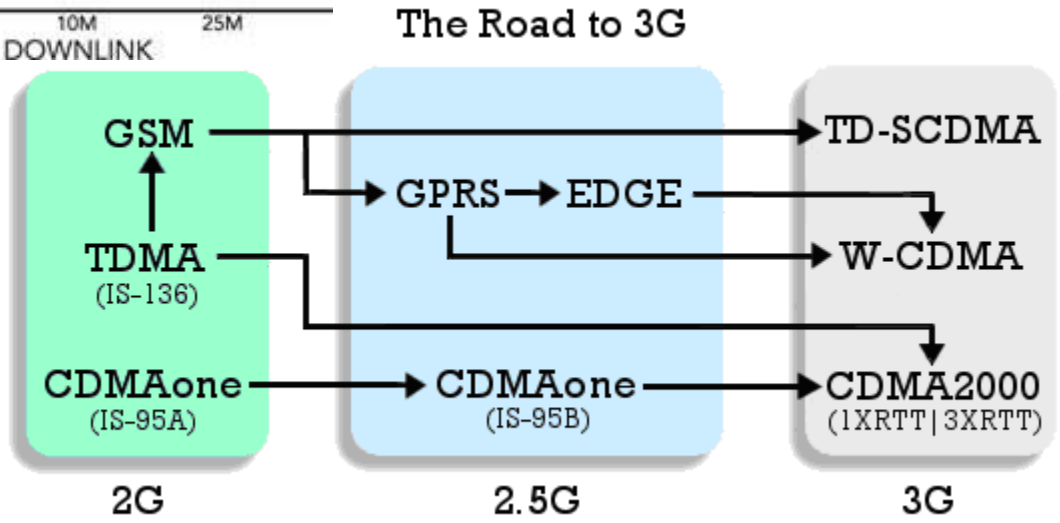




The Road to 3G

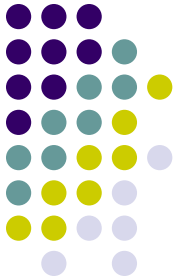
Evolution of mobile standards:





MODERN REVOLUTION IN COMMUNICATIONS:

The Road to 3G

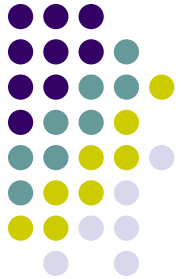


3G Standard was developed by International Telecommunication Union (ITU) and is called **IMT-2000** (International Mobile Telecommunications 2000).

Main goals:

- Global roaming
- New level of speed

Main Changes in Information Architectures

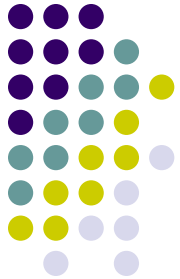


2000: predominately **server-centered** applications that integrated information processing and storage. Tightly coupled hardware and software for sensing, processing, and acting on information.

2006: emergence of **mobile-device-centered** applications, decoupled components for building new applications:

- Determine and display location and some content without contacting the server; database on mobile device
- Interoperable software components

Main Changes in Technologies



- **Platform independent programming**
  1. Java – byte code requires interrupter
  2. XML-HTML format representation of data

- Platform independent operation systems (?)
  1. Microsoft
  2. Unix/Linux

  Now we have problems with compatibility of OS

  Solution: Convergence?

The Evolution of “University Formula”

What is university in brief?

“Formula” – is the shortest answer:

From XI till XIX century:

Library + Peoples

The lecturer reads the book, and students listen

The Evolution of University Formula

From end XIX till end XX century:

1. **Library + Peoples**
2. **Equipment + Science and Practice**

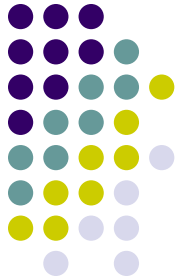
The Evolution of University Formula

XXI century:

1. **Library + Peoples**
2. **Equipment + Science and Practice**
3. **Internet + Innovations and scientific business initiative**

(based on modern communications, mobile computing and so on)

How Second Internet Revolution Change the World



Changes in traditional parts of modern university

New generation of Libraries: E-library!

On-line! Every library of the world for everybody!

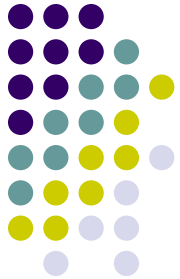
Example: Google's Library Project: 1 million books now! (Normally Uni-library has 1-5 mln books)

Next future: 30 million books for all Internet's users!

Always with you! The whole library can be on mobile phone now!

Example: Electronic Bible on our mobile devices, supported by Java-applet

How Second Internet Revolution Change the World



Changes in traditional parts of modern university

New generation of Equipment: Computing!

On-line! Every computing device can communicate with each other and everybody through the Internet!

Example: Cisco Corporation: Millions devices for Internet communications worldwide are supervised and served from every engineering workplaces!

In result: world record of capitalization (600 billions $)

Always with you! Your workplace are with you everywhere and in your hands

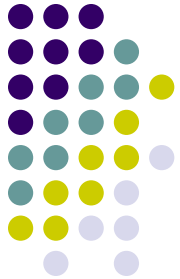
The Evolution of University Formula

XXI century:

1. **Library + Peoples**
2. **Equipment + Science and Practice**
3. **Internet + Innovations and scientific business initiative**

(based on modern communications, mobile computing and so on)

How Second Internet Revolution Will Change the World



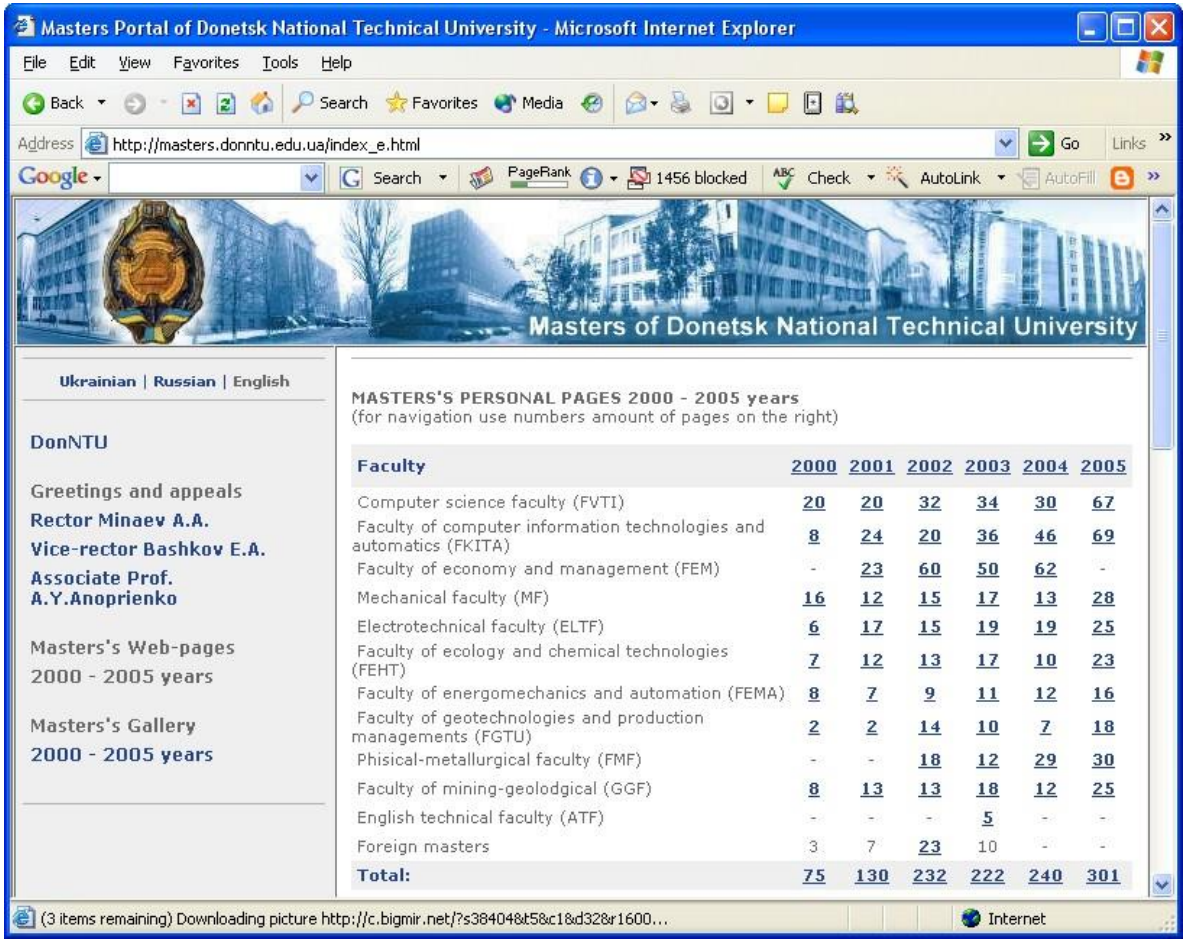
New generation of innovations and scientific business initiative :

On-line! Everybody can now begin innovative E-business or/and M-business through the Internet!

New opportunities “E-business” for millions clients all over the world!

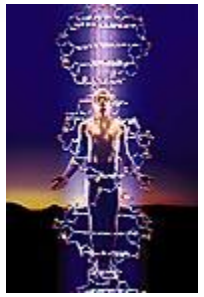
Always with you! Notebook or/and mobile phone are now main devices for worldwide innovative business!

Master's portal of DonNTU - base for for educational and personal development for our students



The Future is born in Universities

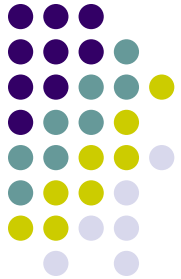
XXI century:



- **Library + Peoples**
- **Equipment + Science and Practice**
- **Internet + Innovations and scientific business initiative (based on modern communications, mobile computing and so on)**

+ Mental and intellectual potential!!!

Master's portal of DonNTU - base for for educational and personal development for our students



Links to sources and literature:

1. Anopriyenko A., John S., Al-Ababneh H. Simulation Tools and Services for Mobile Users: History, State-of-the-art and Future // Proceedings of the International Conference & Workshop on 3G GSM & Mobile Computing: An Emerging Growth Engine for National Development, 29-31 January, 2007. – College of Science and Technology, Covenant University, Canaan Land, Ota, Nigeria. 2007. P. 9-20.
2. Anopriyenko A., Bashkov E., Minaev A. University and Revolution in Communications and Computing: Experience of Donetsk National Technical University // Proceedings of the International Conference & Workshop on 3G GSM & Mobile Computing: An Emerging Growth Engine for National Development, 29-31 January, 2007. – College of Science and Technology, Covenant University, Canaan Land, Ota, Nigeria. 2007. P. 34-46.
3. Anopriyenko A., Ababneh Hasan, John Samuel Ndueso, Bandwidth usage maximization for enhancement of data exchange efficiency in TCP/IP-based networks // Informatics, Cybernetics and Computer Science (ICCS-2007). Scientific Papers of Donetsk National Technical University. Volume 8 (120). Donetsk, 2007. P. 331-339.
4. Minaev A., Bashkov E., Anopriyenko A. Master's Portal as the Practical Result of Studying Web-technologies // Proceedings of the International Conference on Engineering Education ICEE 2005 "Global Education Interlink", Silesian University of Technology. – Gliwice, 2005, Vol. I. S. 727-732.