

Knowledge Economy and IT Education in Hungary

Digital Literacy and IT Professionalism

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Presentation's Focus

- Historical overview
- The present situation, Information Society maturity level (figures, graphs)
- Education, trainings on different levels → from basic IT skills to IT professionalism
- Risks, problems, difficulties
- Looking forward

Information Society - Different Approaches

Different approaches:

- education and skills → spreading digital literacy, digital culture
- turning out teachers specialized on IT
- opportunity for using computers in education, on trainings, in work and also in the daily life → providing computers, tools, Internet access (high speed network, mobile access on acceptable price), software
- IT-committed (not IT-specialists) professionals
- electronic services on every business, administrative and social activity

and last but not least:

- teaching and turning out globally employable IT professionals possessing knowledge and skills on high quality

Information

I. 1994-2000:

- defining conc (EU etc) Inform
- establishing t

II. 2000-2006: emb the Informatio

III. From 2007 sta

- governmental
lack of Informatio
- gaining strength of pressure and claim from the academic side, professional and civil organizations and also from the ICT enterprises

Result: slowing rate of growth (KEI/2007: 7,64 placing: 28. from 32./2005) → the main problem lies on changing the way of thinking.

It was a great pleasure for me to hear this morning from Gabor Bodi and from Pal Strommer that from the beginning of 2008 the situation is changing, They stated that the Government takes the responsibility for eInclusion program both from its financial needs and also in being close cooperation with the relevant parties. It has clear strategy and also action plan for performing it.

The Present Situation

Analysis and Diagnosis

- Research projects for mapping and analyzing the issues and the maturity of the Information Society, the actual situation and the results
- Programs for defining responsibilities and tasks

At present the population is classified from two aspects:

1. digital literacy, culture; Information Society maturity

A: regular computer and Internet users (weekly or frequently)

B: not permanent users (use computers only occasionally)

C: non users, lagging behind (they do not use computers and net)

2. social classes:

– lower class: TV/radio centric, uninterested for the ICT

– middle class: media cultural and freetime centric, social sensitive, being good situated active people

– high class: ICT and free time centric, fashionable young people („yuppies”), being high situated cultural elit

Digital Literacy in Hungary – Some Figures

Source: Database of the World Internet Project (Hungarian survey)

Groups	Total	Age: → 18-39	40-59	>=60
A: Permanent users	27,4% →	18,1%	8,2%	1,1%
Opportunity Index:		8,85	8,37	8,49
B: Not permanent users:	16,8% →	9,7%	6,1%	1,0%
Opportunity Index:		6,13	6,32	6,02
C: Non users:	55,8% →	11,9%	19,6%	24,3%
Opportunity Index:		3,87	3,54	2,27

Opportunity Index point

low opportunities: 0-2,5 p
 small opportun.: 2,51-5,0 p
 good opportun.: 5,01-7,5 p
 high opportun.: from 7,51

The private digital opportunity index in different settlements:

↓ Settlements * Social Classes →	low	middle	high
Budapest (capital)	15,4	7,9	30,4
Cities	41,7	47,1	50,5
Villages	42,9	45,0	19,1

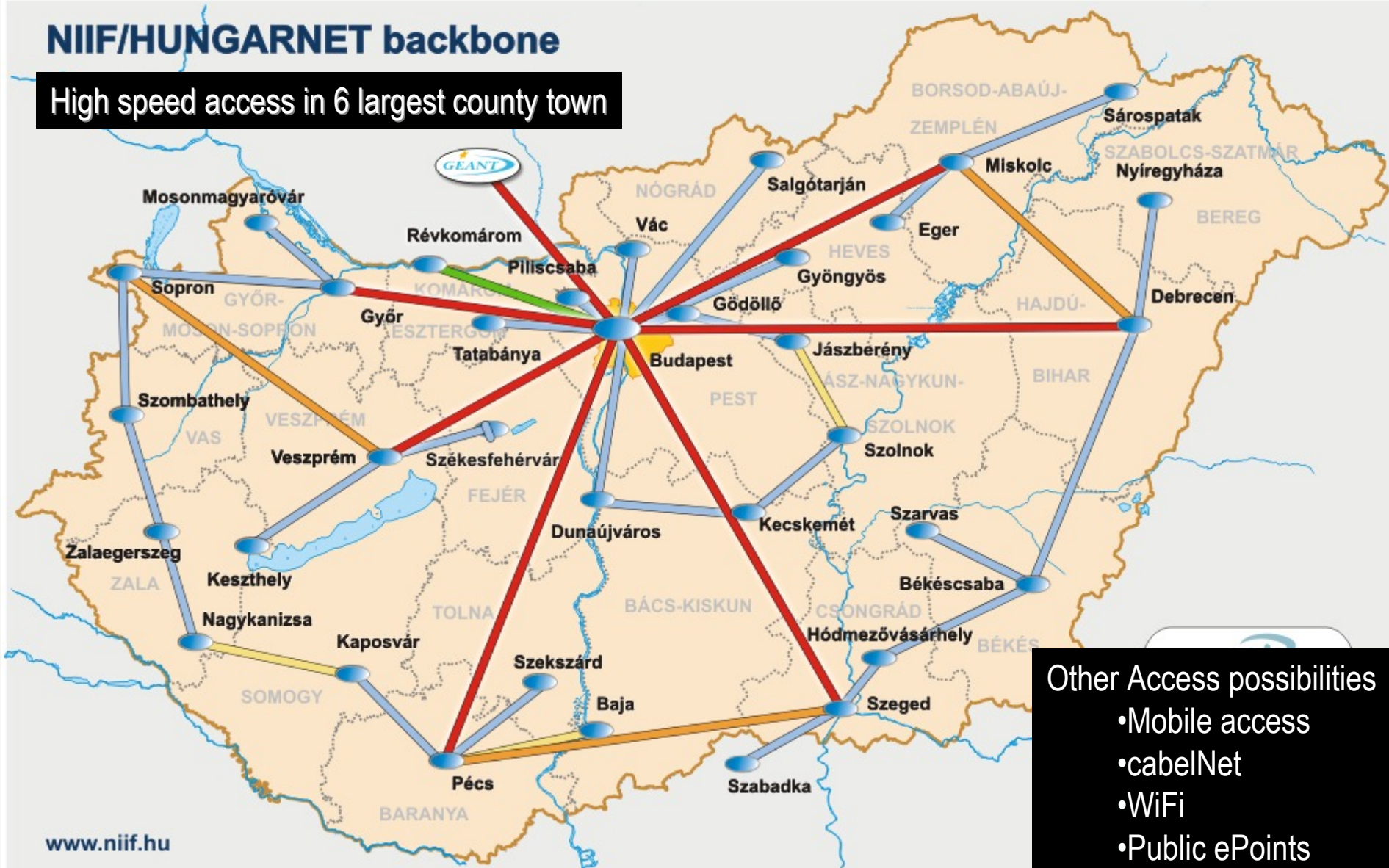
Some Results

- Producing **information infrastructure**:
 - high speed network: 10 Gbit/sec (See the map on the next slide)
 - computers in the schools (18,5% vs 61,4% in EU),
 - access to the Internet: public WiFi and eMagyarország Internet access points (more than 3.000), 439 IT service centers (Teleház), digital towns but: no Internet access in 20% of the Hungarian settlements
 - Széchenyi Program: that helped the SMEs to invest ICT solutions
 - Sulinet Program: supported the teachers and students in purchasing computers and other digital tools without paying VAT
- **R+D+I**: governmental supported programs for developing and using the newest ICT solutions, financed by research centers in business
- **Digital content on the Web**: Digital Library of National Cultural values, digital Database, digital maps etc.

The Hungarian Network


NIIF/HUNGARNET backbone

High speed access in 6 largest county town



- Other Access possibilities
- Mobile access
 - cableNet
 - WiFi
 - Public ePoints

How to Realize the Goals: the Main Tasks

- Spreading digital culture in civil and business sphere: giving basic computer knowledge and skills on every age and every education level
- Increasing role of the professional organizations such as NJSZT, VISZ, INForum: with arranging trainings, preparing and publishing popular educational materials, IT-books, TV-programs (e.g. Univ. of Knowledge), teaching how to use out the ICT, how to live, learn and work in the Information Society
- Programs of supporting economy and politic: eCommerce, on-line banking, eGovernment, eAdministration, open universities
- Legal background: codifying Law for Data protection, for Digital Signature (e.g. digital tax confession)
- Education of CS/IS/IT on different levels 

CS/IS/IT in Education

Education of on different levels:

- In primary schools
 - Computer as a school equipment
 - Basic computer skills in optional groups
- In high schools
 - Obligatory IT-subject that gives computer skills presented by qualified teachers
 - Computers as presentation tools in different subjects
 - Internet Access in every high school
- ECDL in 138 centers managing by the NJSZT, 10% of graduates have already certificate, ministerial support
- IT-Professionalism in Higher Education System:
Newly introduced three level System (BSc, MSc, PhD) based on Bologna Process.
By 2010 all courses must run under the new system



Defining the Basic Disciplines

- **17th of June 2003**
 - the law LXXX./1993. was modified: the §30. declares, that by the year of 2006 the universities have to teach by the new curriculums
- **The urgent tasks from governmental side (Accreditation Comm.)**
 - specifying the disciplines and the structure of the new HES in general
 - creating the new governmental circumstances and conditions, and
 - the way of financing.
- **Tasks of Bologna Committee (IS/IT experts and professors):**
 - decision about the CS/IS/IT coourses (before: 130 IT courses, now: 3 different)
 - specifying the course structure completed with 30 credits/semester)
 - defining competences and qualification requirements (QR)
 - fixing starting criteria and conditions and
 - preparing, accrediting courses and curriculums, and starting education

The Decision of the CS/IT Bologna Committee

CS/IS/IT is a stand alone scientific field

courses in the CS/IT-group

- technical informatics → 69% (2007)
- program designer (software developer) → 19% (2007)
- business informatics (Wirtschaftsinformatik) → 12% (2007)

course structure in three cycles

- basic university level with 210 credits (by ISED V.)
- master level 120 credits (by ISED IV.)
- doctoral degree 180 credits

knowledge structure and credits

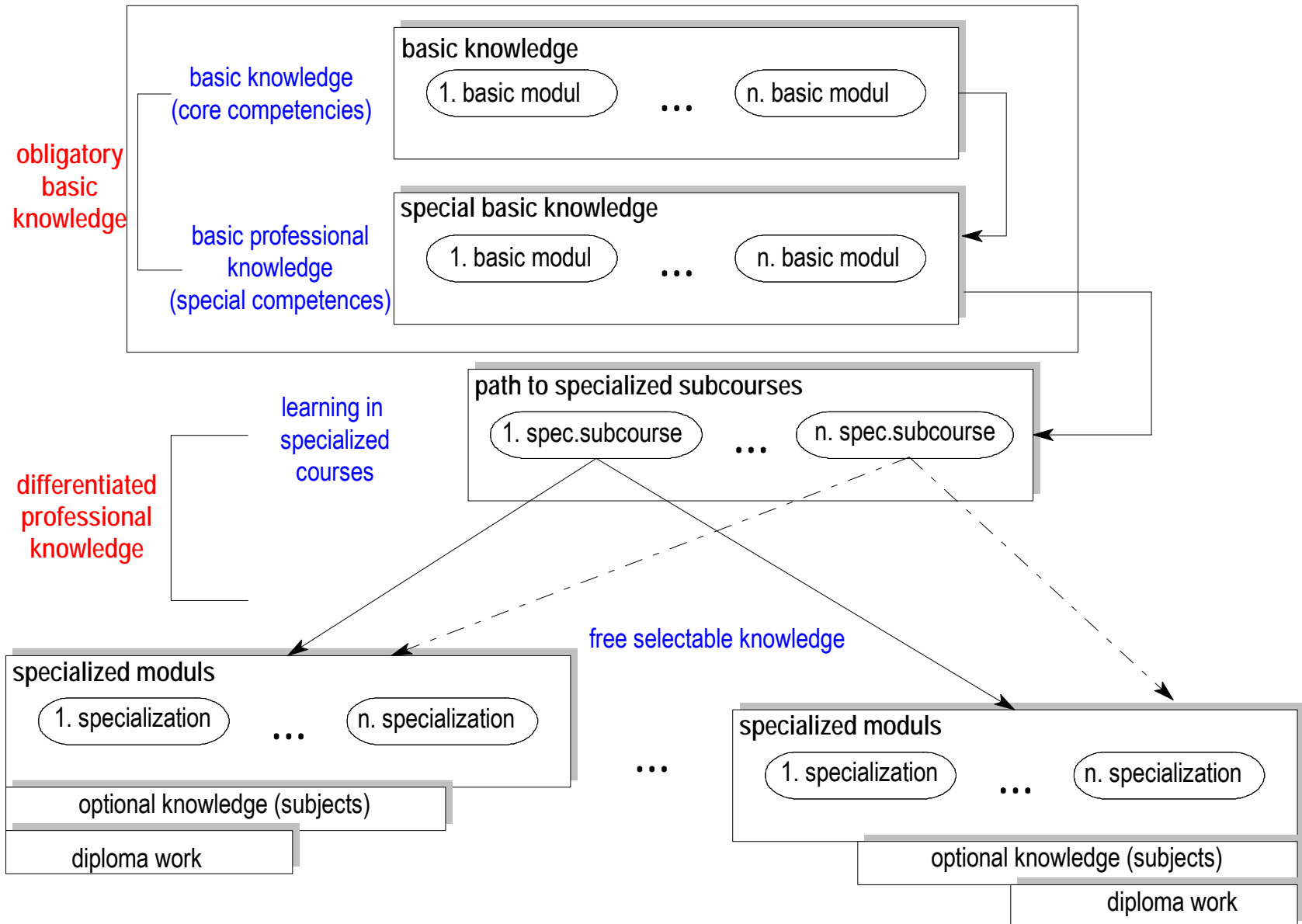
- general basic knowledge → core
- basic professional knowledge →
- specialized professional knowledge

qualification requirements (basic and sp

- study aim and competences
- diploma qualification

Based on having studied the documents of
ACM SIGITE, IEEE CS, IFIP,
CEPIS EUCIP, AIS,
SFIA Foundation, BCS, CIPS,
ACS Computer Societies

The Knowledge Structure of CS/IT-courses



The Qualification Requirements: Core Competencies

Knowledge of

- architecture of computers and computer-networks
- *system software* (concepts and tasks of operation systems, protocols) and *system close software* (programming languages, data base management systems, utilities etc.) and skills in application
- software development methodologies and techniques
- logical programming, artificial intelligence techniques

Skills in

- designing, analyzing and implementing algorithms
- using visual modeling tools (UML) and CASE technologies
- recognizing the problem space and solving problems
- designing, creating databases
- Web programming

The Qualification Requirements: Special Competencies

Knowledge of

- intelligent enterprise applications (MIS, EIS, DSS, CRM etc.)
- standards and (MOF, EAI, UML, CWM, XMI/XML, CORBA)
- expert systems concepts, skills in development and application
- juristic questions concerning to the development and application of different IS/IT solutions

Skills in

- modeling and designing organization information systems,
- planning computer environment and operating IS/IT infrastructure
- using OMG's MDA framework
- adopting business information systems in practice, cooperating with users and managing application development projects
- organizing/managing units responsible for IS/IT tasks
- designing, implementing and operating multimedia applications

Risks and Problems during the Change Over

- lack of resources (professors, rooms, labs) for teaching parallel the different systems (traditional and three-level ~)
- the walk-through criteria between the traditional and the new systems are not correctly and unambiguous defined
- the education/training quality is very different in the various universities and colleges
- the applicants come from different sources with different educational and cultural background,
- there is a great diversification among the EU-countries in culture, in financial and infrastructural facilities, and also in supporting systems inside and outside the institutes

As Conclusion

Although we have nice results achieved there are important tasks left which are necessary to solve as soon as possible, we have to increase :

- the level of Internet penetration,
- the level and wide spreading of digital literacy
- the opportunity of IT students' mobility and
- our role in the international programs.

Thank you for the attention!

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The Knowledge Structure in the IS/IT course-group

Knowledge fields	Technical Informatics	Program Designer	Business Informatics
fundamentals /general basic knowledge	60-90	55-100	55-90
natural sciences: mathematics, physics, computing theory, operations research, AI	40-45	55-85	20-35
social and economic sciences: economics, juristic, organization and management, decision theory, financing, controlling	20-25	0-15	35-55
special fundamentals /basic professional knowledge	55-95	50-135	70-100
system theory and technology (digital systems, comp. architectures, networks, , operation syst.	25-45	10-20	15-20
programming and sw-technology	15-25	30-45	10-15
information systems: architecture, components, IS analysis, modeling and design, database design, information management, EIS	15-25	10-20	45-65

Acceptance criteria: Minimum 40% difference between courses in the educated knowledge