Budapest University of Technology and Economics

Selected R&D&I results at Hungarian universities, potential incubation topics, mid-term plans at BME

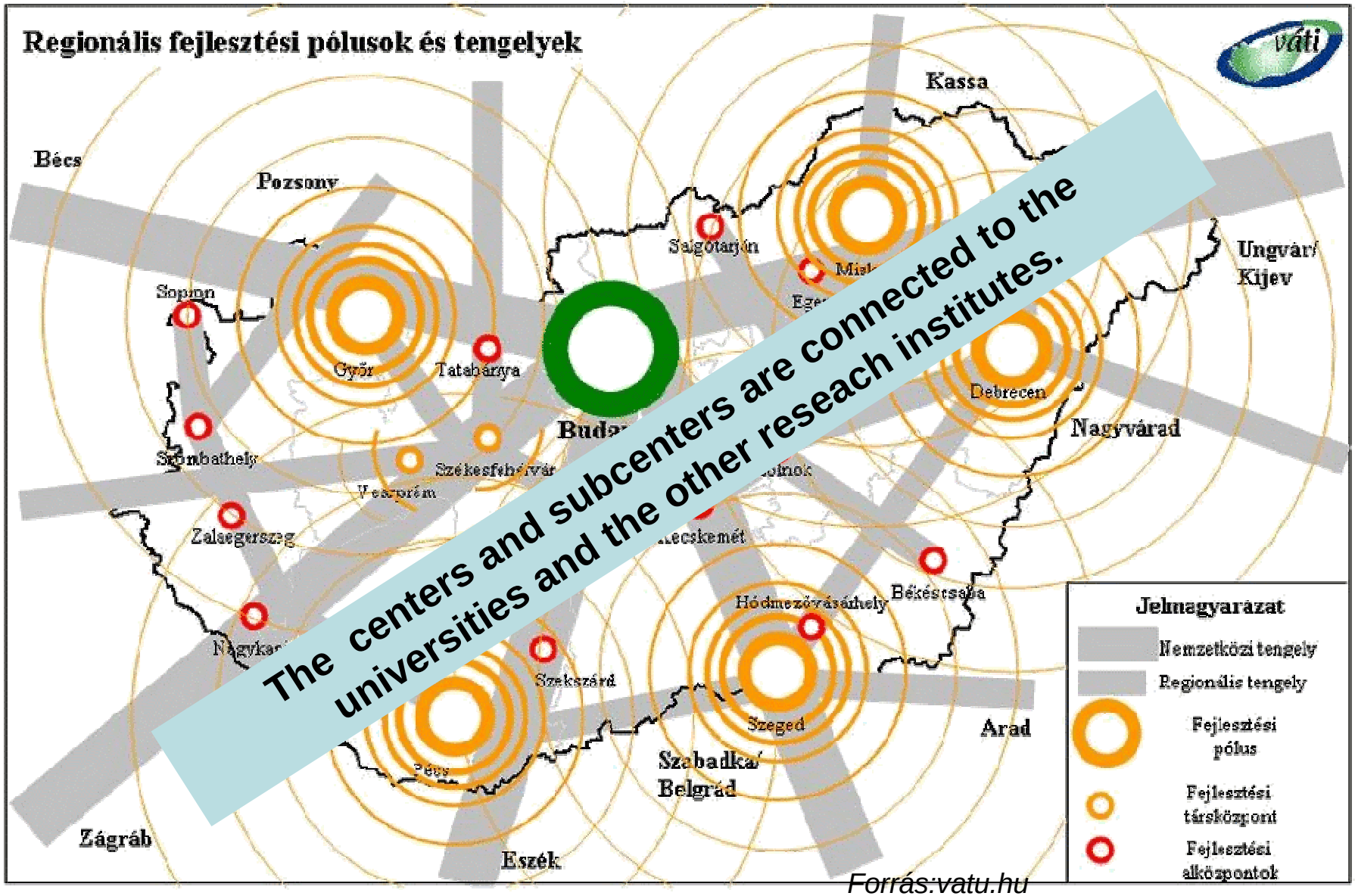
Tömösközi, Sándor

Hungarian-Israeli Technology Incubation
and Technology Transfer Seminar
12 October 2009

Hungarian Universities

Academy of Drama and Film (Hungary), Budapest
Andrássy Gyula German Language University of Budapest
Budapest University of Technology and Economics
Central European University, Budapest
Corvinus University of Budapest
Evangelical-Lutheran Theological University, Budapest
Hungarian University of Fine Arts, Budapest
International Business School - Budapest
Jewish Theological Seminary – University of Jewish Studies, Budapest
Károli Gáspár University of the Hungarian Reformed Church, Budapest
Liszt Ferenc Academy of Music, Budapest
Moholy-Nagy University of Art and Design, Budapest
Pázmány Péter Catholic University, Budapest
Reformed Theological Academy of Debrecen
Semmelweis University, Budapest
Széchenyi István University, Győr
Szent István University, Gödöllő
Eötvös Loránd University
University of Debrecen
University of Kaposvár
University of Miskolc
University of Pannonia, Veszprém
University of Pécs
University of Szeged
University of West Hungary, Sopron
Miklos Zrinyi National Defence University, Budapest

Hungarian R+D activities – Poles and Clustres



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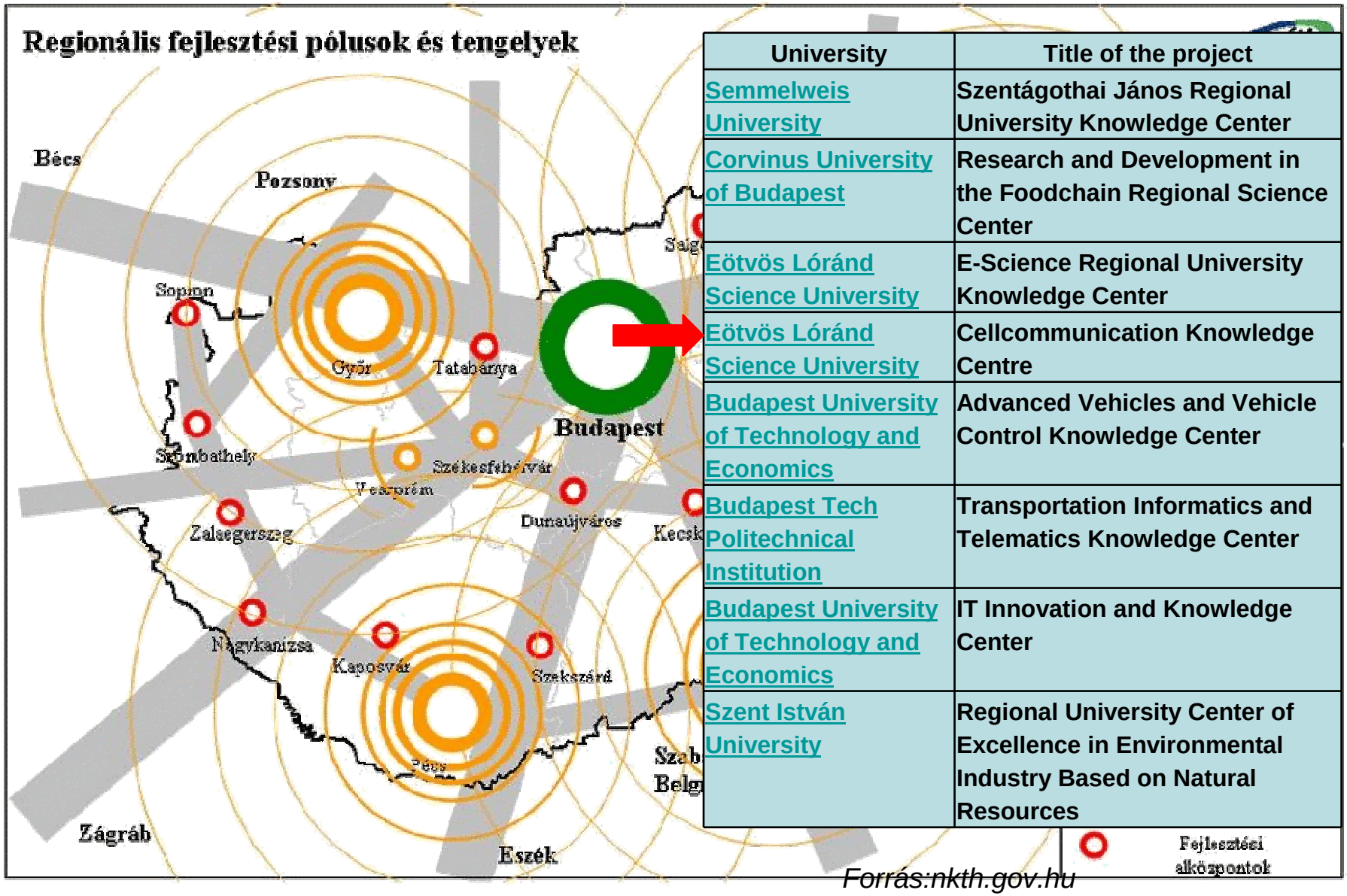
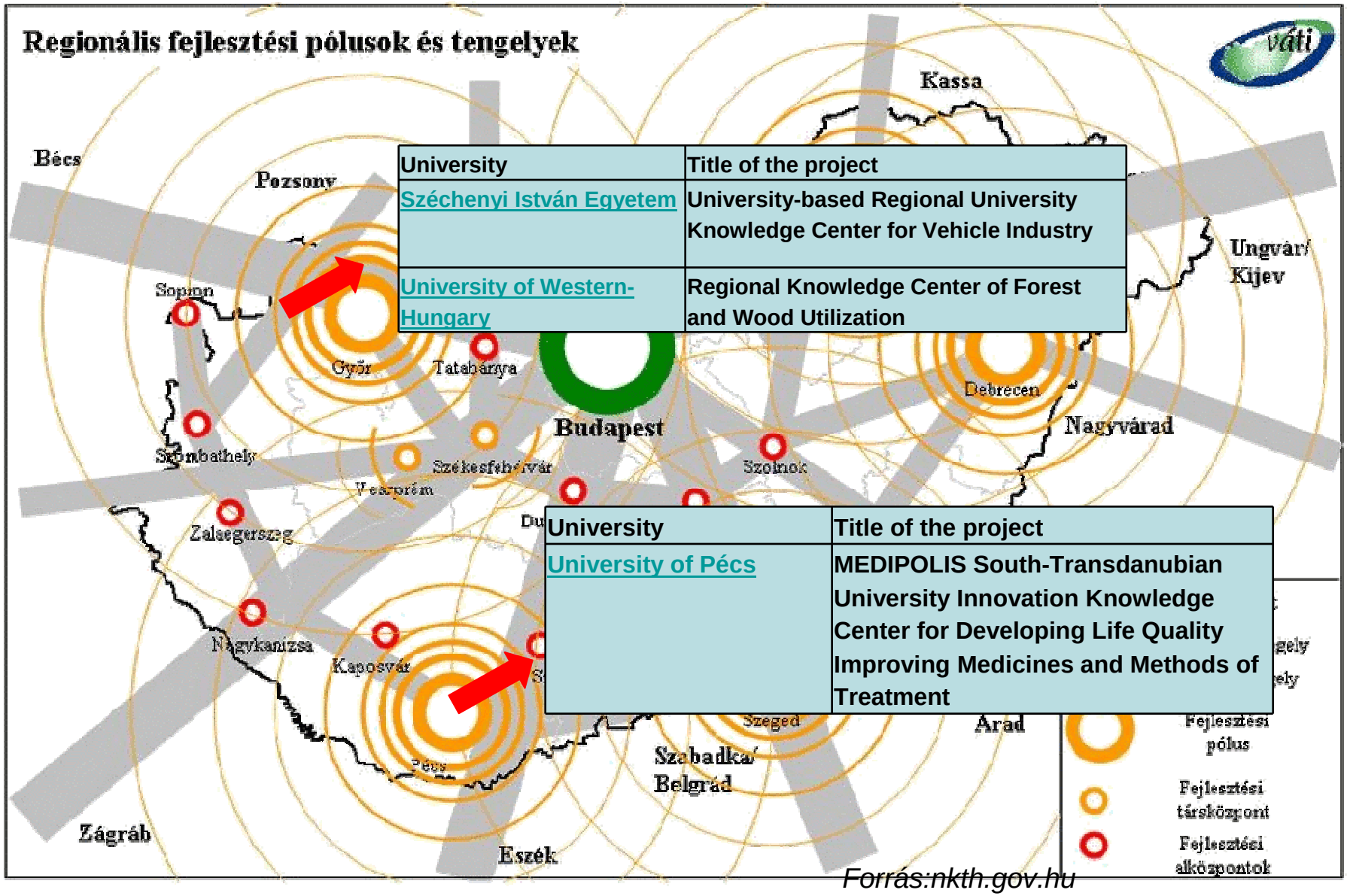
R+D activities at the universities – Regional Knowledge Centers



University	Title of the project
Semmelweis University	Szentágothai János Regional University Knowledge Center
Corvinus University of Budapest	Research and Development in the Foodchain Regional Science Center
Eötvös Lóránd Science University	E-Science Regional University Knowledge Center
Eötvös Lóránd Science University	Cellcommunication Knowledge Centre
Budapest University of Technology and Economics	Advanced Vehicles and Vehicle Control Knowledge Center
Budapest Tech Politechnical Institution	Transportation Informatics and Telematics Knowledge Center
Budapest University of Technology and Economics	IT Innovation and Knowledge Center
Szent István University	Regional University Center of Excellence in Environmental Industry Based on Natural Resources

Forrás:nkth.gov.hu

R+D activities at the universities – Regional Knowledge Centers



University	Title of the project
Széchenyi István Egyetem	University-based Regional University Knowledge Center for Vehicle Industry
University of Western-Hungary	Regional Knowledge Center of Forest and Wood Utilization

University	Title of the project
University of Pécs	MEDIPOLIS South-Transdanubian University Innovation Knowledge Center for Developing Life Quality Improving Medicines and Methods of Treatment

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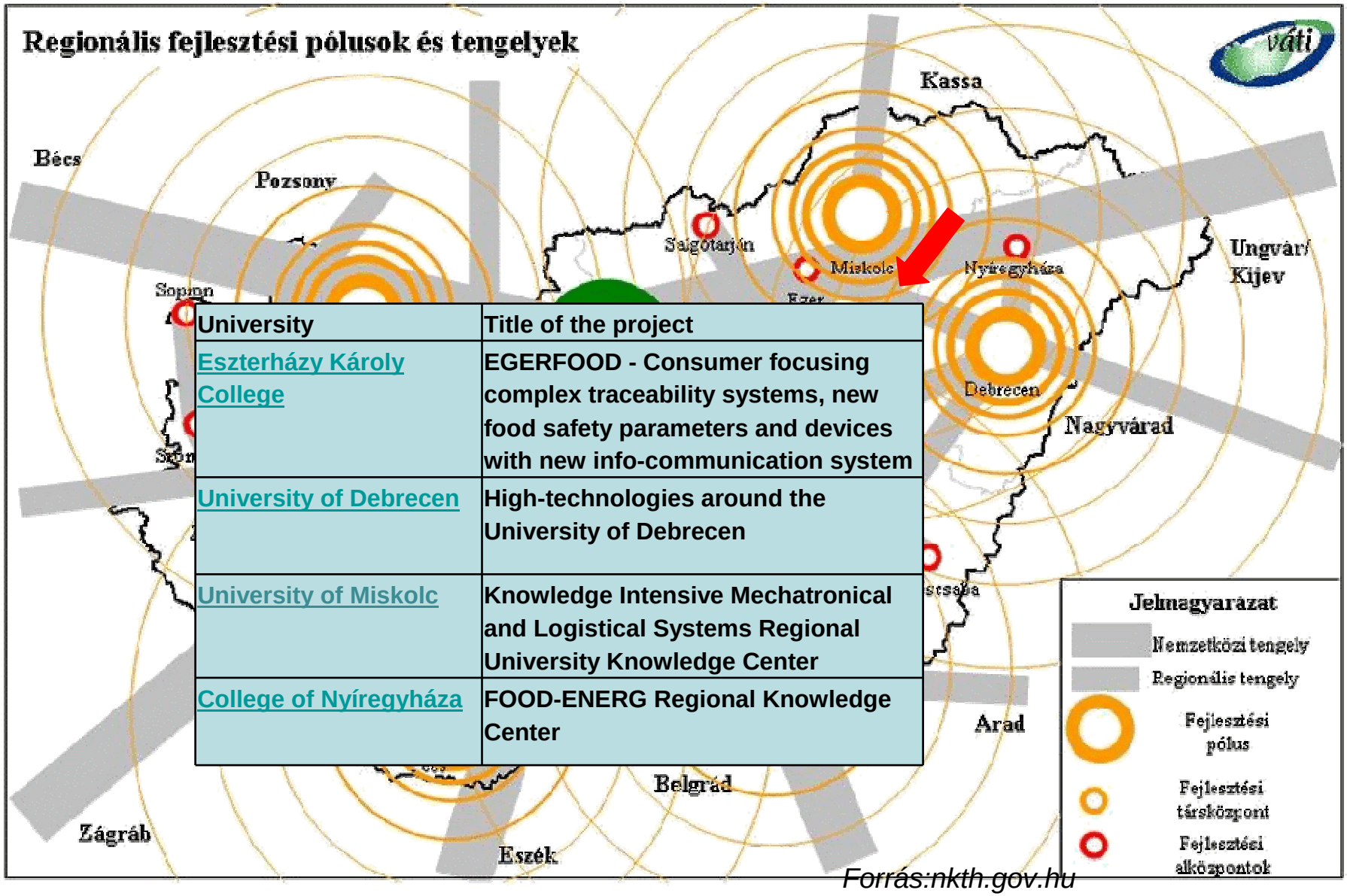
R+D activities at the universities – Regional Knowledge Centers



University	Title of the project
Eszterházy Károly College	EGERFOOD - Consumer focusing complex traceability systems, new food safety parameters and devices with new info-communication system
University of Debrecen	High-technologies around the University of Debrecen
University of Miskolc	Knowledge Intensive Mechatronical and Logistical Systems Regional University Knowledge Center
College of Nyíregyháza	FOOD-ENERG Regional Knowledge Center

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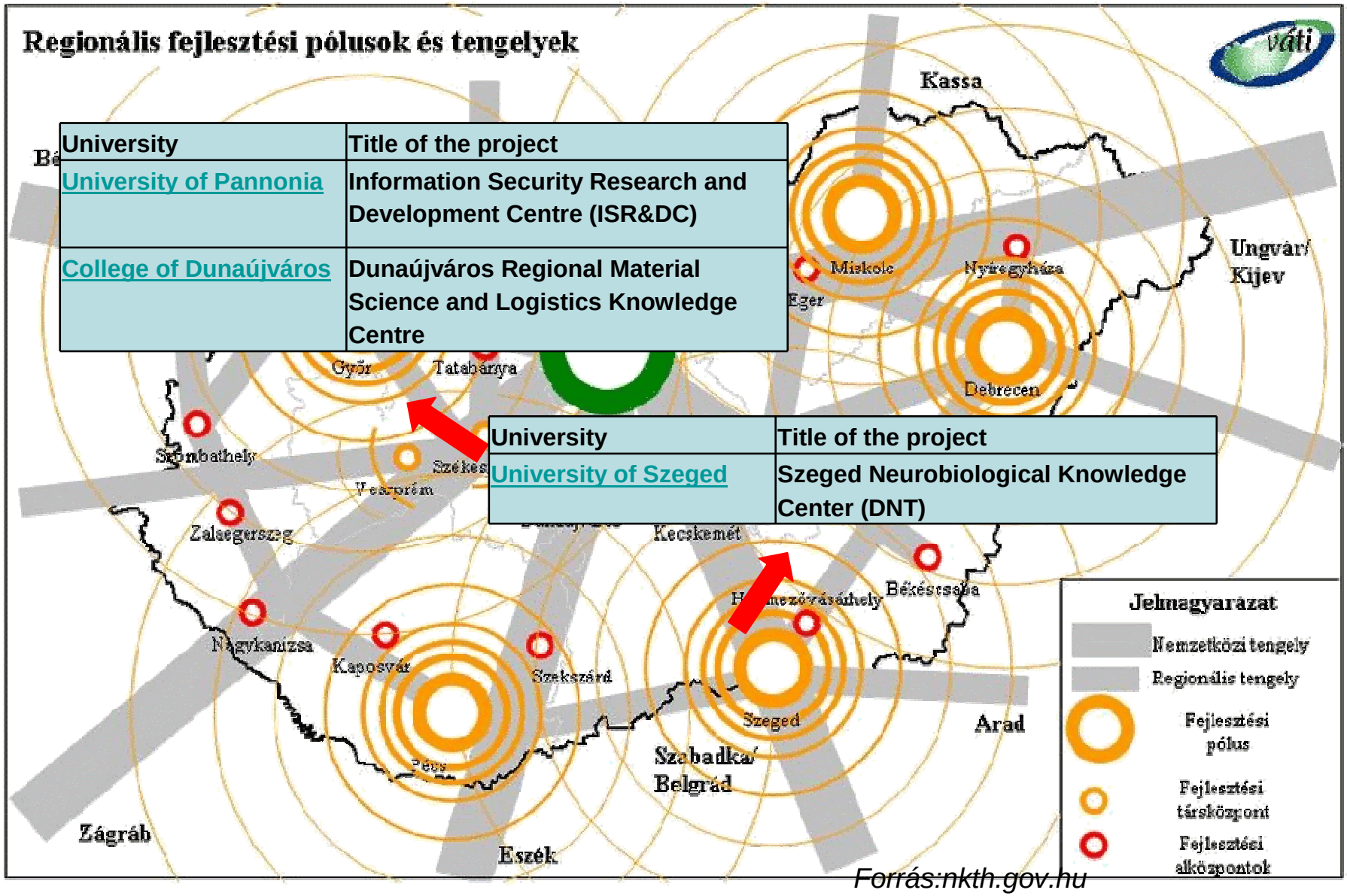
R+D activities at the universities – Regional Knowledge Centers



University	Title of the project
University of Pannonia	Information Security Research and Development Centre (ISR&DC)
College of Dunaújváros	Dunaújváros Regional Material Science and Logistics Knowledge Centre

University	Title of the project
University of Szeged	Szeged Neurobiological Knowledge Center (DNT)

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Hungarian R+D activities – EU projects (examples)

>> CarboEurope – CO2 emission
>> SEAFOODplus – consuption of fishes
>> CABRIVOLGA – risk assessment
>> NEXT – green machines
>> EUROPEAN LEUKEMIANET
>> PARADOX- antioxidants from red vines for functional foods
>> LowHeat- - heat energy from waste water
>>HOLOVISION
>>Az X3-NOISE – noise of airplanes in 2020.
>>SCIENCEDUC – developent of education
>> Healthgrain – impr. of nutritional functions of cereal based foods
>> MoniQA – development of analytical methods for food safety

Forrás:nkth.gov.hu

R+D activities at the universities – Some typical areas

>> Biotechnology
>> Material- and nano sciences
>> Health-related industries
>> Pharmasuetical industries
>> IST, and E-sciences
>> Food- and agricultural related areas
>> Advanced vehicles and vehicle controls
>> Environmental industries
>> Energy
>> Alternative energy sources
>> Mechatronical and logistical systems
>> Chemical industries
>>Mechanical engineering

Hungarian R+D activities – sources of R+D supports and related information (examples)

- *National Office for Research and Technology (www.nkth.gov.hu)*
- *Hungarian Scientific Research Found (www.otka.hu)*
- *National Development Agency (www.nfu.hu)*
- *Homepages of universities and research institutes*

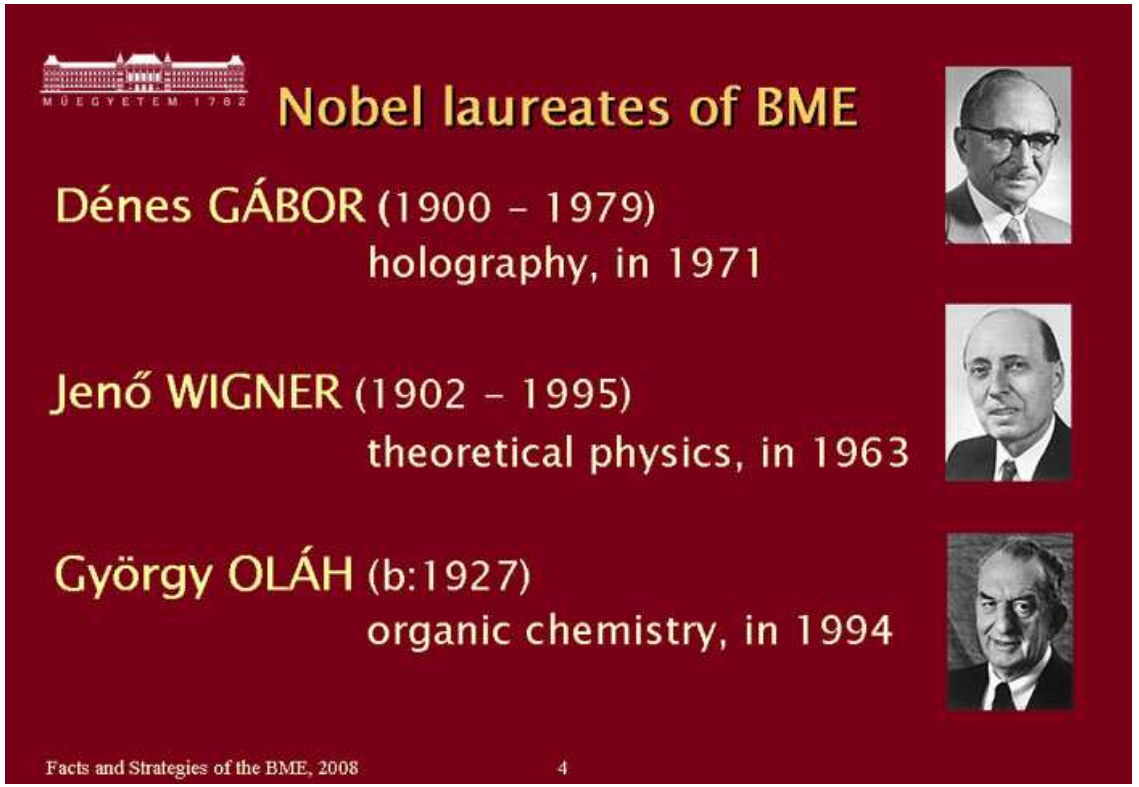
Other information sources, for example:

- *OECD Reviews of Innovation Policy: Hungary (www.nkth.gov.hu)*

Case study – BME

We have ….

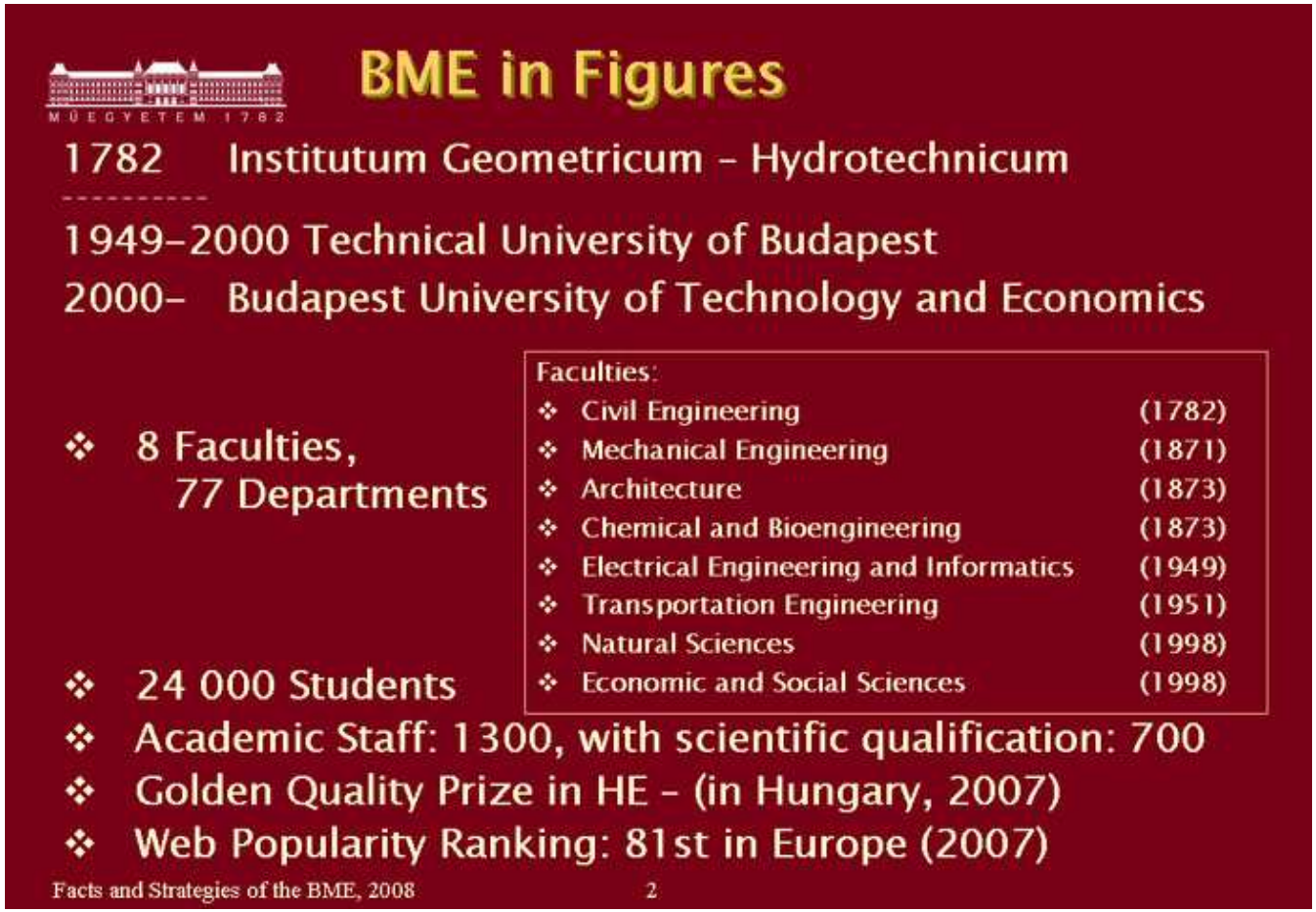
- Tradition from 1782.
  - ❖Institutum Geometricum –Hydrotechnicum
  - ❖World-renowned scientists



Case study – BME

We have ….

- Great human recources and structural background



Case study – BME

We have ….

- Compatible educational system

Education at the BME

- Traditional Dipl. Eng. Programs (MSc, 5 years) – in Hungarian
- From 2005/2006 two-cycle linear higher education system in Hungary (Bologna process). Engineering education in general:
  - 7 semester BSc programs (210 credits)
  - 4 semester MSc programs (120 credits)
- PhD Programs (3 years)
- BSc, MSc and PhD curricula in English, partly in German, French, Russian
- Since 1994 European Credit Transfer Scheme
- Programs are qualified by the Hungarian Accreditation Body (MAB)
- Continuing Engineering Education, postgraduate courses, MBA, etc.

Facts and Strategies of the BME, 2008 6

Case study – BME

We have ….

- Strong research activities

Case study – BME

We have ….

• Interesting and valuable scientific results and technological developments

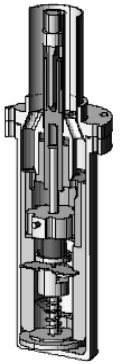
Superconductivity and its applications

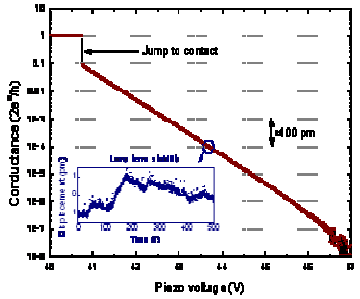
composits

Thermal Investigation of Integrated Circuits

Non-food application of cereal components

experimental solid state physics





Case study – BME

A suggestion from existing cooperation: *superconducting mini power plant*

The goal is to design, construct and test an all superconducting power complex (ASPC) realized in a superconducting (SC) mini power plant (MPP) model in the power rating range of 10 kW.

The system consists of a

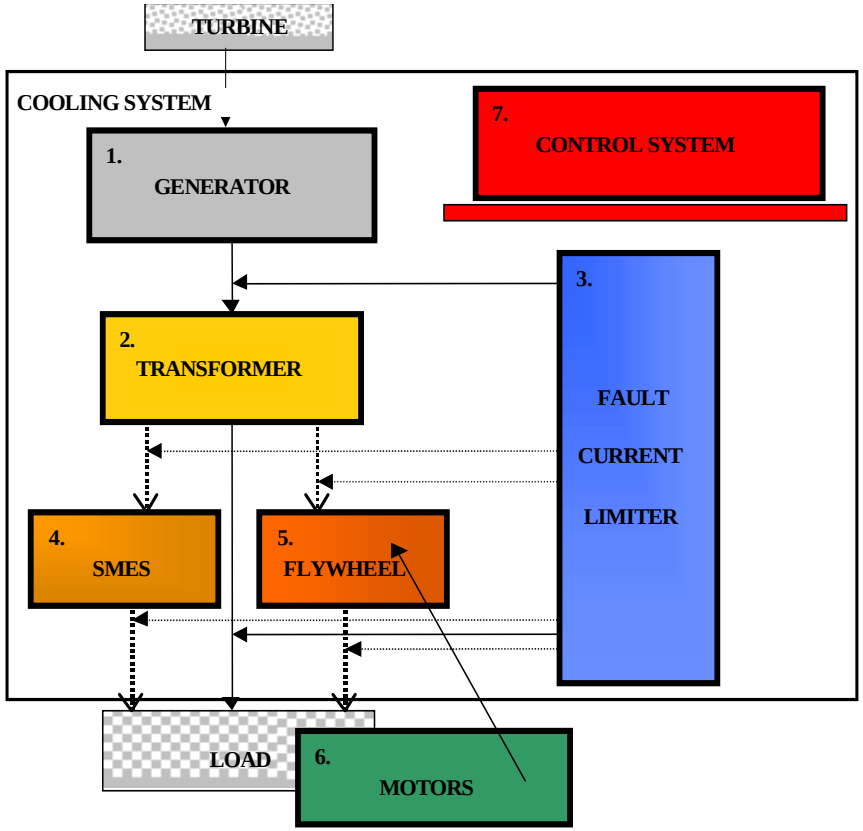
- superconducting generator,
- transformer,
- fault current limiter,
- motor and
- energy storage devices.

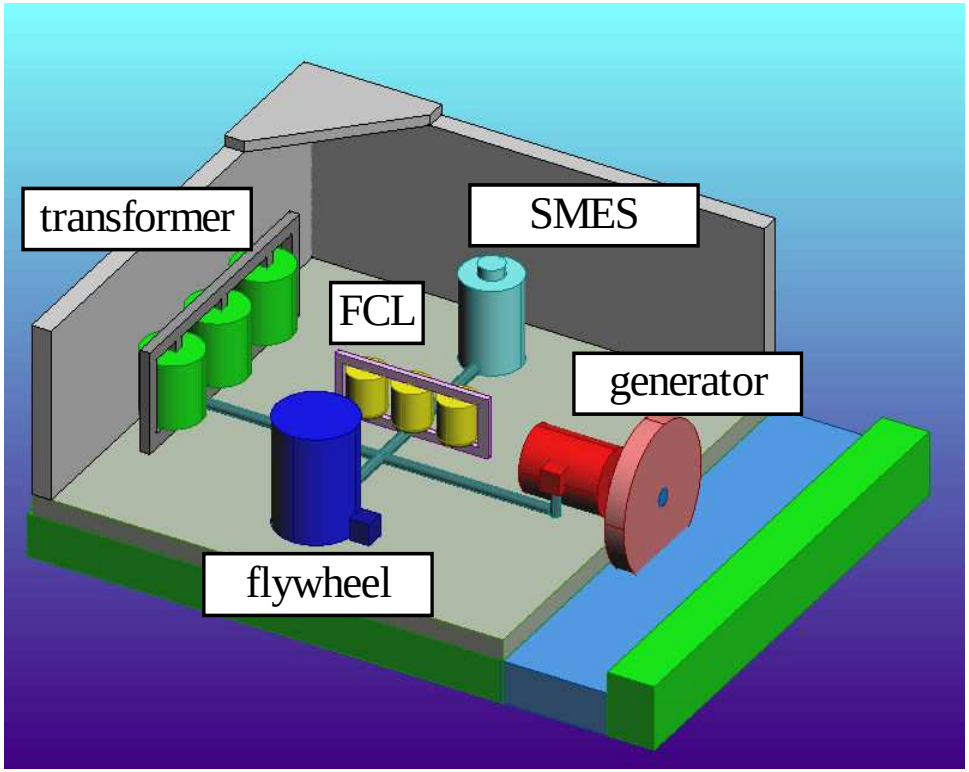
This system possesses substantial additional benefits compared to and exceeding those of the individual superconducting devices.

A whole superconducting plant can be introduced into the power system rather than individual superconducting devices.

Case study – BME

The conception of *superconducting mini power plant (MPP):*





Case study – BME

We have ….

- National and international relationships

Strategic relations – Multinational and *national* companies

- Alcoa
- Audi
- Bosch
- Budapest Gas Works
- Continental Temic
- E.ON
- Ericsson
- Flextronics
- General Electric
- Hewlett-Packard
- Hungarian Electric Works
- Hungarian Oil Co. (MOL)
- Hungarian Posts
- Hungarian Telekom
- IBM
- Intel
- Knorr-Bremse
- Mentor Graphics
- Microsoft
- Nokia
- Oracle
- Paks Nuclear Power Plant
- Pannon Mobile
- SAP
- Siemens
- Visteon

Facts and Strategies of the BME, 2008 19

Case study – BME

We have ….

- and midle-term strategy

The BME Strategic Objectives

A EUROPEAN CENTRE OF EXCELLENCE IN THE CREATION AND TRANSFER OF ENGINEERING AND BUSINESS KNOWLEDGE

- Strong basic education and differentiated, high quality master education, aiming at prestigious BSc/BA and MSc /BA degrees, resp.
- PhD education and scientific qualification in technical and natural sciences, partly in economic sciences
- High-level research, development and innovation in cooperation with academic and business partners, by contracts, agreements and participation in national and European projects;
- Training flexibility corresponding to changing social and professional needs, the extension of curricula in English
- Perceptible contribution to the technical development of Hungary
- To be a valuable member of the European Research and Higher Education Area, harmonising theory and practice.

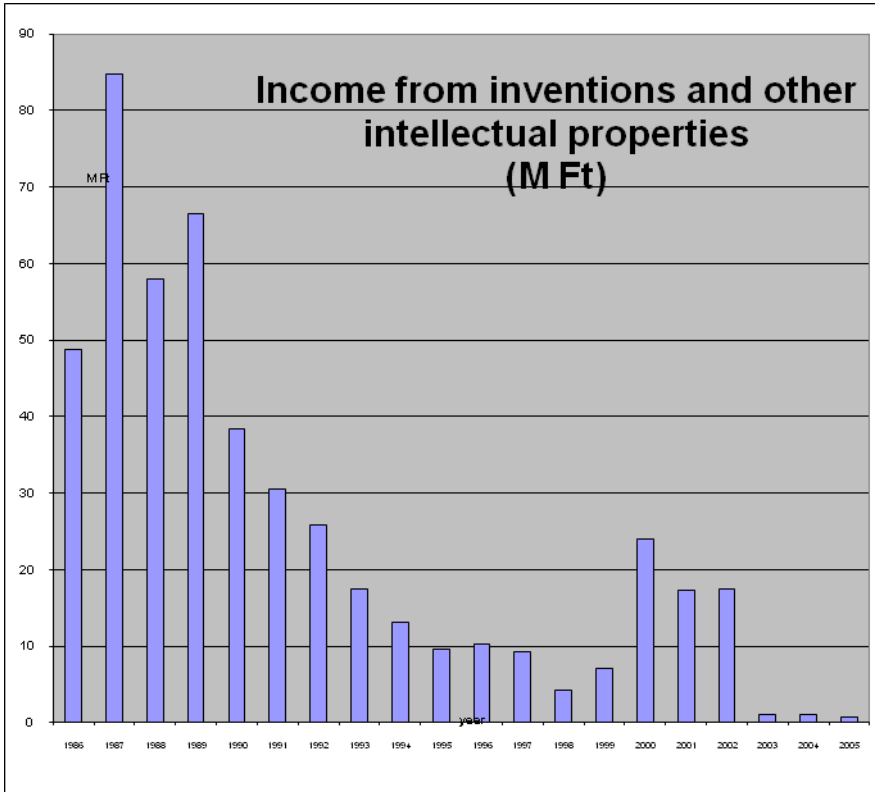
Facts and Strategies of the BME, 2008 24

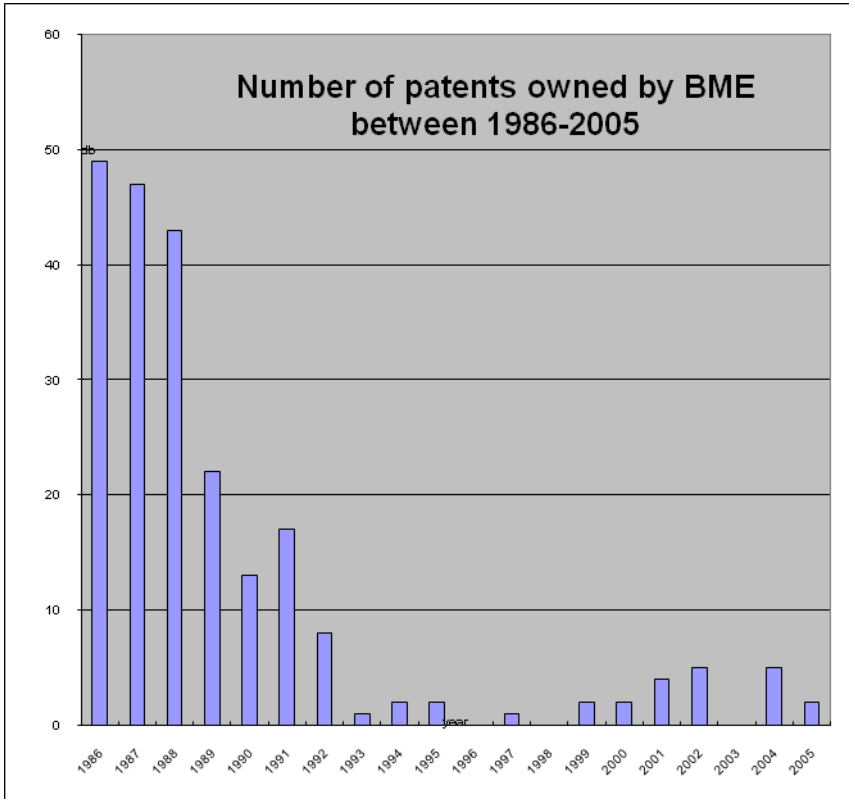
Case study – BME

✓Seems to be a really good background!

☹ Then where are the weaknesses?

Two negative facts…



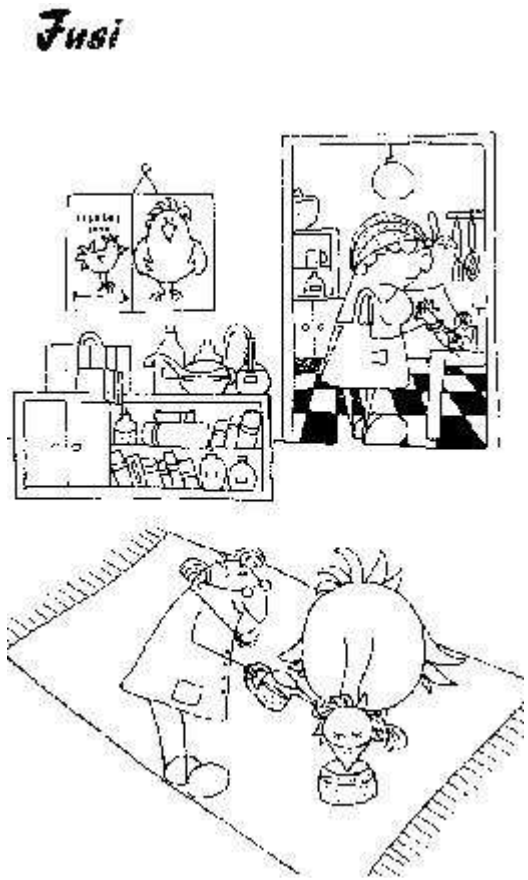


Case study – BME

✓Seems to be a really good background!

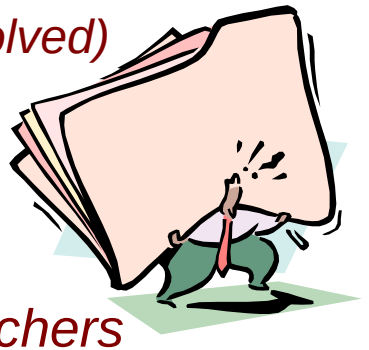
☹ Then where are the weaknesses?

- **CeSpin-out: Central European Spin-out system ☺☹:**
  - Because of the lack of RDI regulation and support system
  - the IPs are utilised in small Ltds (SMEs) partly owned by university's employees
  - positive effect: the utilisation of know-how
  - negative effects:
    - independently from the universities



Where are the weaknesses?

- *The economic environment today*
- *Low number of innovative firms, especially SMS-s*
- *Competitiveness, efficiency,*
- *Critical mass – small research groups, lack of the flexibility*
- *The basic question always: basic research vs applied research*
  - *who will finance them?*
  - *ratio between them?*
  - *profitable results: what are their values? (Money, publications, scientific carrier?)*
- *Ownership of the IPR*
- *Lack of a regular system for TT and incubation*
  - *different situations are existing on different research areas (at IT is OK, at more experimental-oriented research is unsolved)*
  - *lack of the approach and practice*
  - *lack of the effective service for scientists*
  - *way of thinking: What the goal is? To get research money for research or for results…*
- *Aging research staff – lack of the motivation for young researchers*
- *Red tape (bureaucracy) inside and outside*



How can we eliminate our weaknesses?

Have to build up and improve our innovation system with…

⇒*the collection of good practices for RDI systems and services*

⇒*the collection of needs of*

- ⇒*scientific staff and*
- ⇒*RDI partners*

⇒*the survey of*

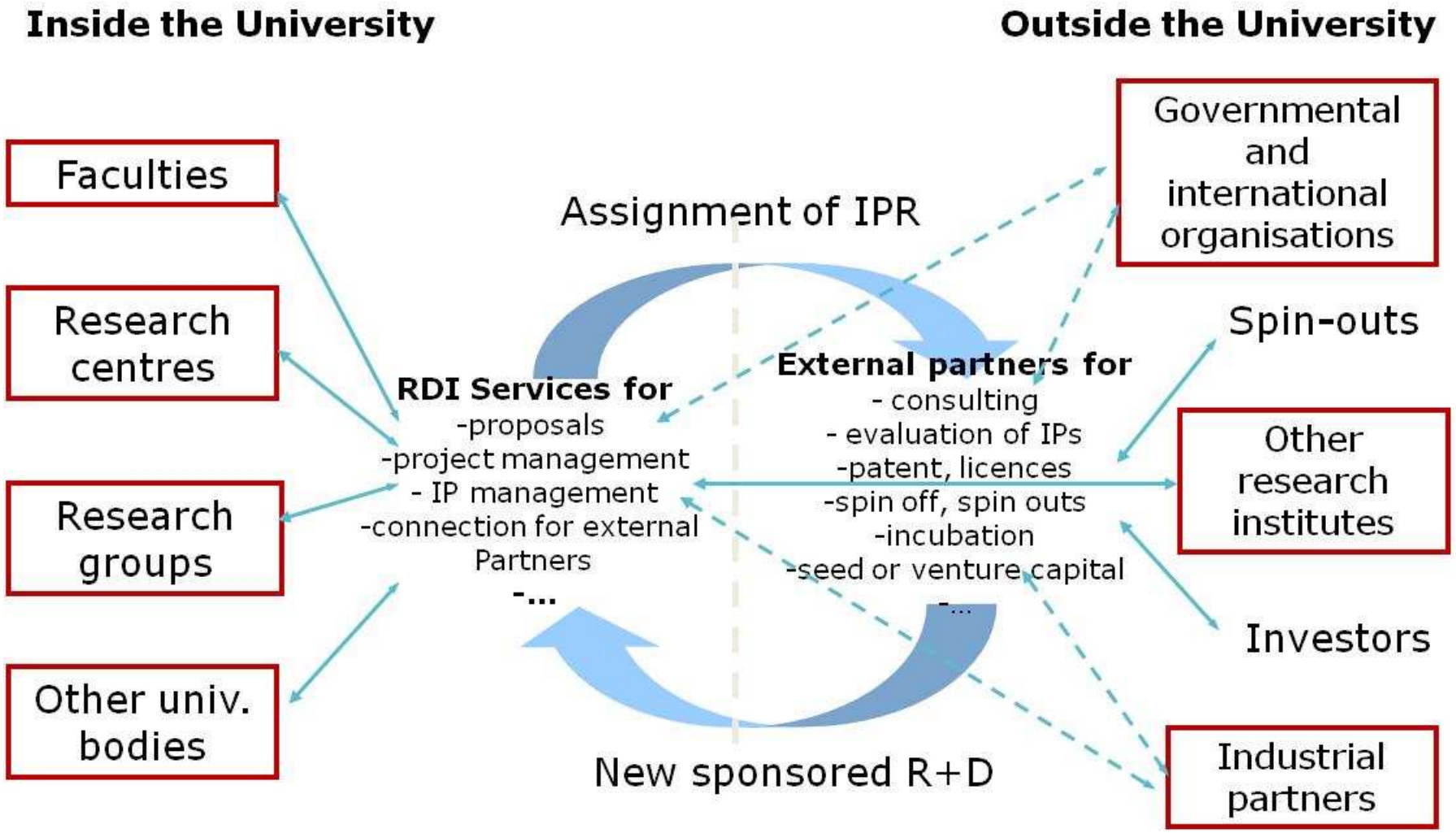
- ⇒*existed IP*
- ⇒*the potentially utilisable know-how, and*
- ⇒*the inovation potential of faculties, departments and research groups*
- ⇒*Comparing the needs with the possibilities*

↓

Forming our RDI system

The planned structure of new RDI system at BME

(„Harmony" of internal and external RDI network)



The main focuses of new RDI system at BME

⇒*IPR regulation, protection and service*

⇒*Utilization of R+D results*

⇒ *incubation (at or out of university)*

⇒*spin-off, spin out, etc.*

⇒*technology transfer (at or out of university)*

⇒ *More flexible partnership with industrial partners (SME-s?)*

⇒ *Service and market oriented RDIsupport (instead of overregulation)*

⇒*more effective help for researchers in the all step of the innovation chain*

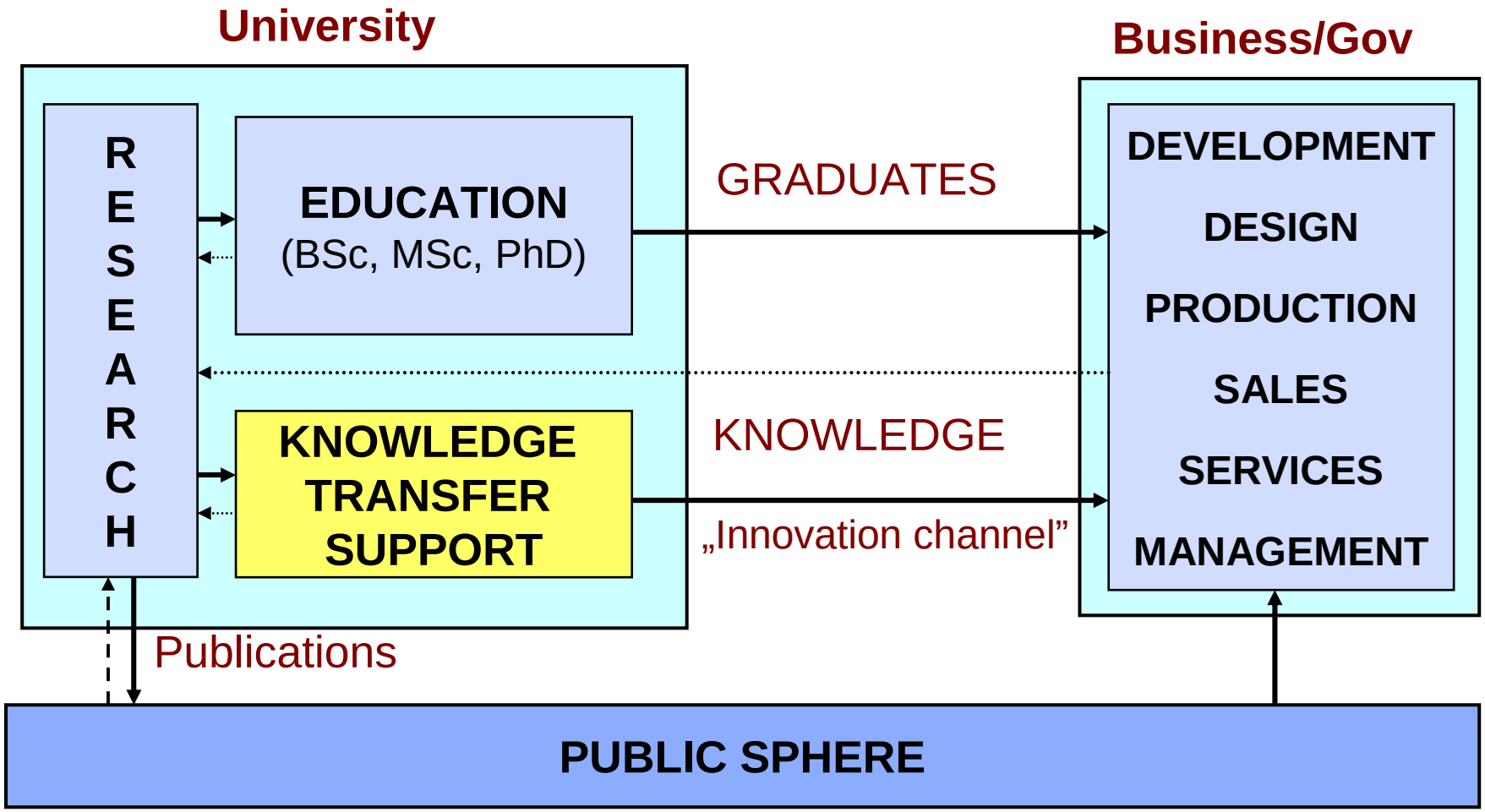
⇒*Involving young scientists into the whole RDI processes*

⇒ *Forming the culture of innovation and/or attitude at the university*

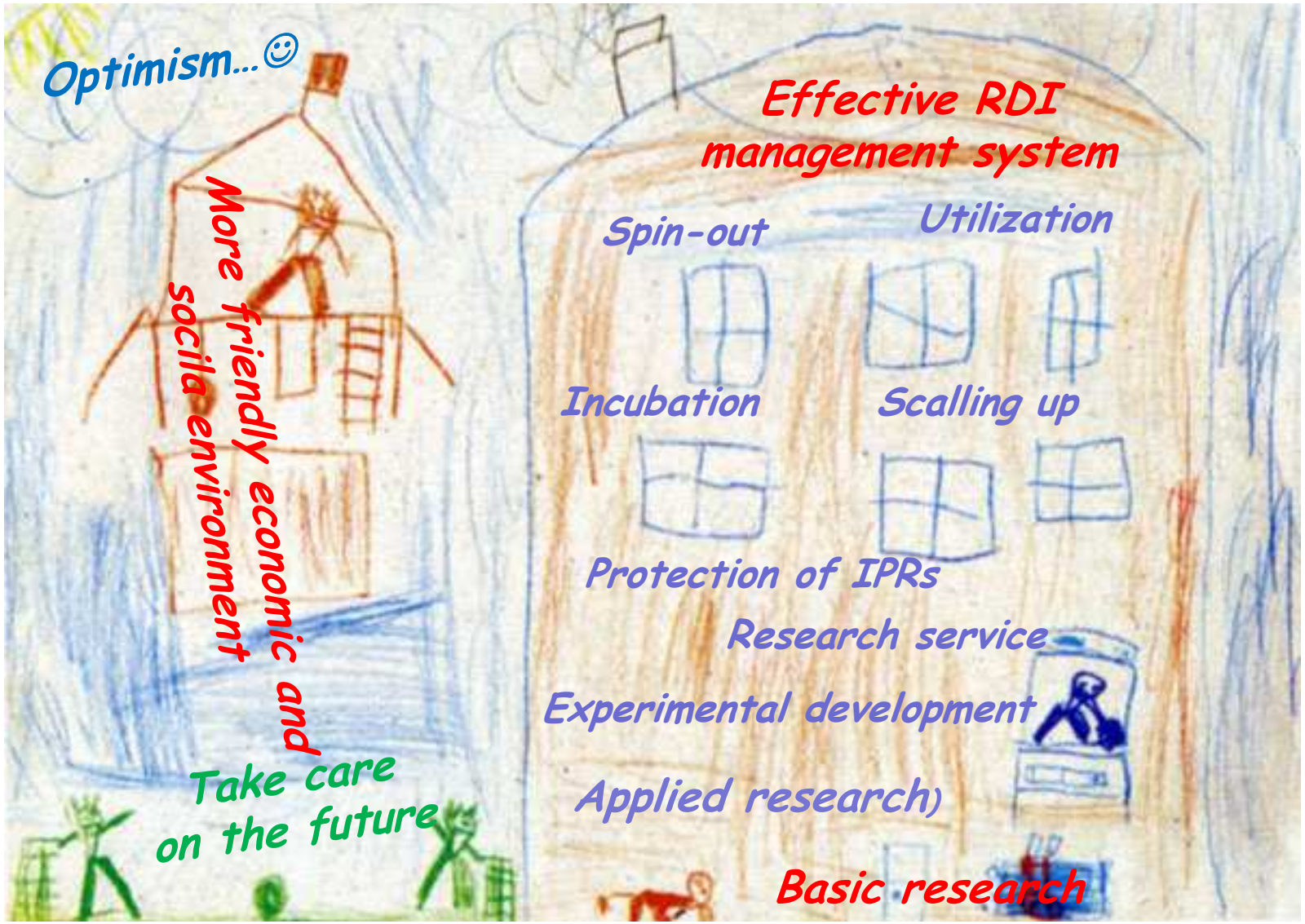
!!! More professional (and financial) support is needed in the beginning phase!!

TÁMOP-4.2.1/08/1/KMR *supported by National Development Agency*

Knowledge Transfer Model



(Instead of) Summary



Rajz forrása:gyerekrajz-pályázat