MŰEGYETEM 1782

THE FIRST THREE YEARS OF BME (IT)^2 AND HOW TO GO ON?

(Models in law – a multidisciplinary project in the second cycle R&D program of the BME Innovation and Knowledge Centre of Information Technology)

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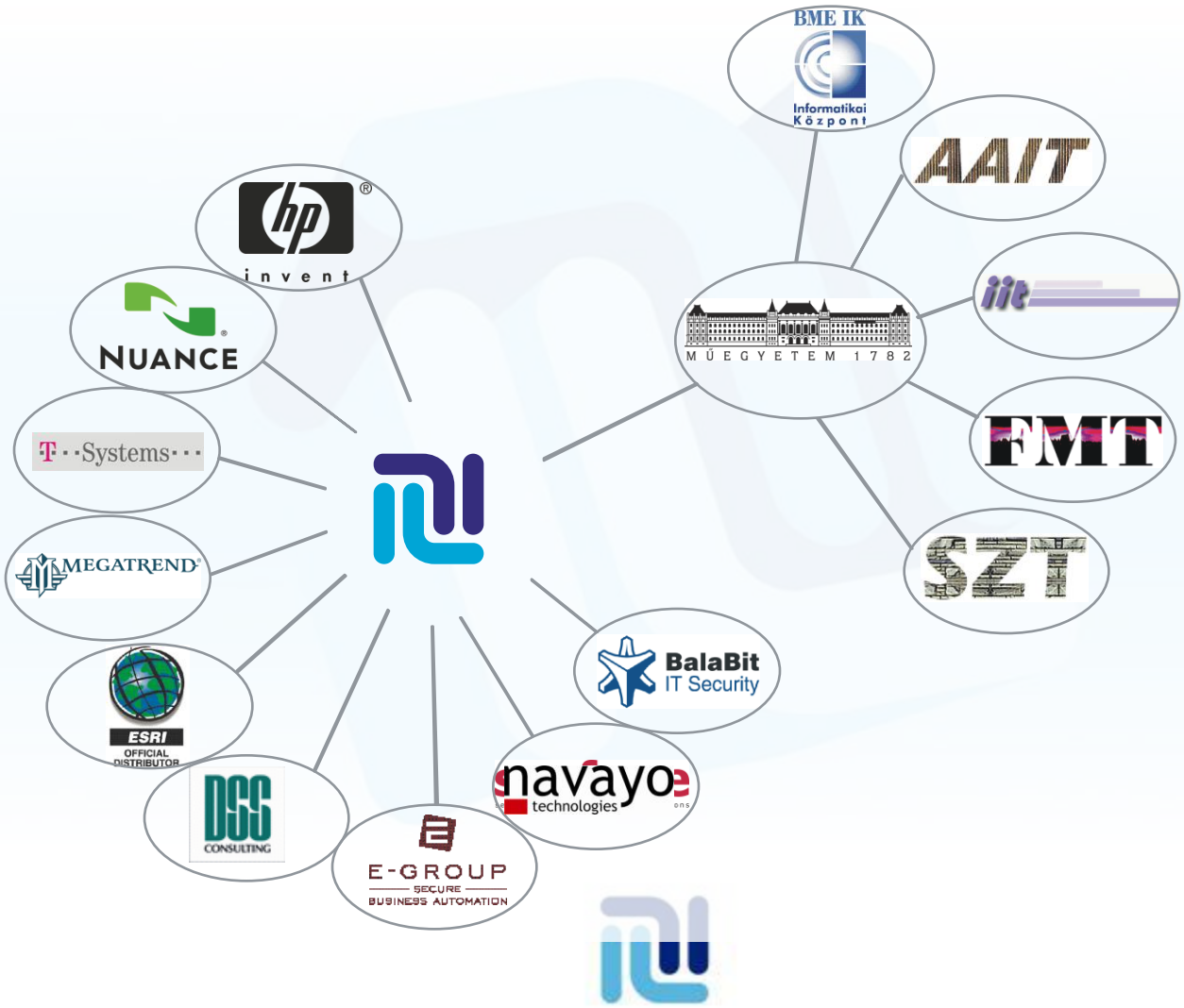
ECSS 2009 Paris, 8 October

BME INNOVATION AND KNOWLEDGE CENTRE OF INFORMATION TECHNOLOGY

What is BME $(IT)^2$

- A Hungarian **Innovation** and Knowledge Centre (2005)
- Consortium of 9 enterprises and 5 departments
- Hosted by Budapest University of Technology and Economics

FOUNDER CONSORTIUM MEMBERS (2005)



BME in Figures

1782 Institutum Geometricum -Hydrotechnicum

2000 Budapest University of Technology and *Economics*

90 Departments

24 000 Students, incl. 834 PhD students

18 BSc and 17 Master Programs,

15 Doctorate Schools

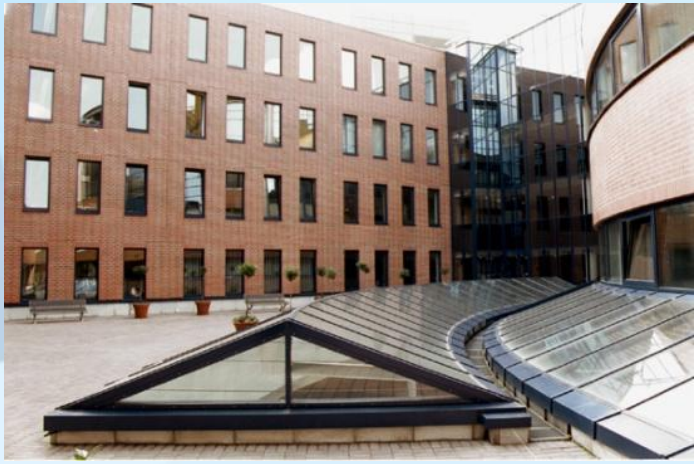
Academic Staff: 1314,

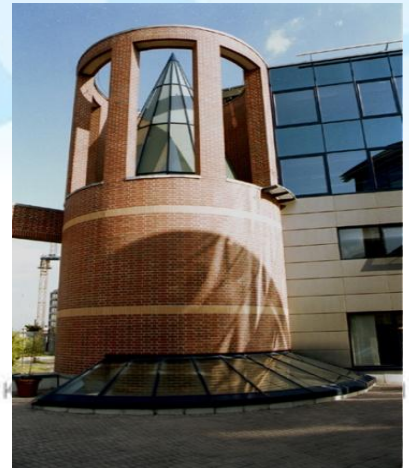
with scientific qualification: 680

8 Faculties:

- **Civil Engineering (1782)**
- **Mechanical Engineering (1871)**
- **Architecture (1873)**
- **Chemical Engineering (1873)**
- **Electrical Engineering (1949) and *Informatics* (1992)**
- **Transportation Engineering (1951)**
- **Natural Sciences (1998)**
- **Economic and Social Sciences (1998)**

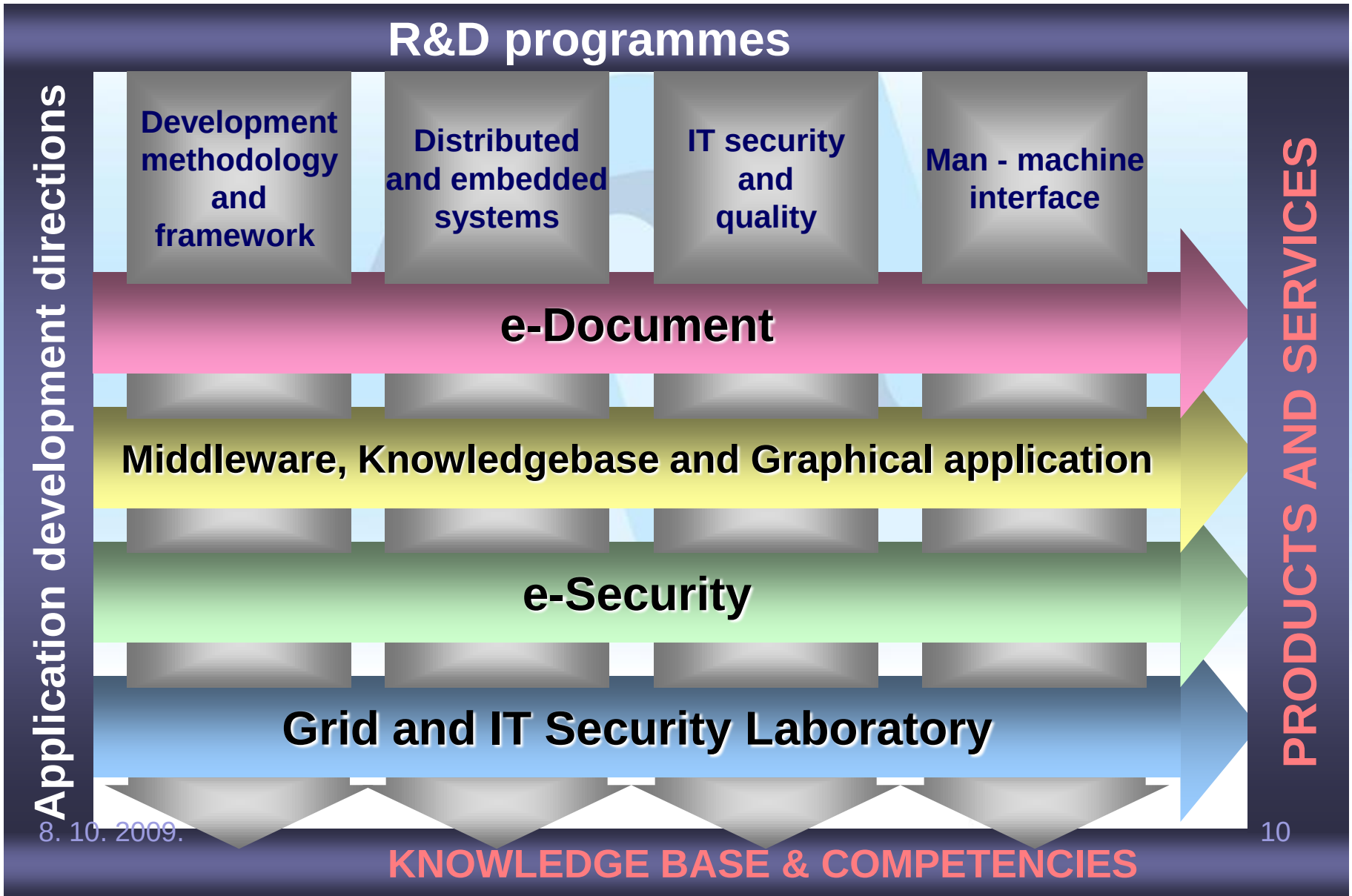

Building G
Building E
Building D
Building I
Building C
Building B





Outline

- **First 3 years**
  - Project structure
  - Embedded in the UNI
  - Infrastructure
  - Highlights
- **Side-effects**
  - e-Government framework
  - NESSI-Hungary
- **How to go on?**
  - Conditions
  - New interdisciplinary projects
    - SOA-based integration and its application in e-government
    - Models in Law

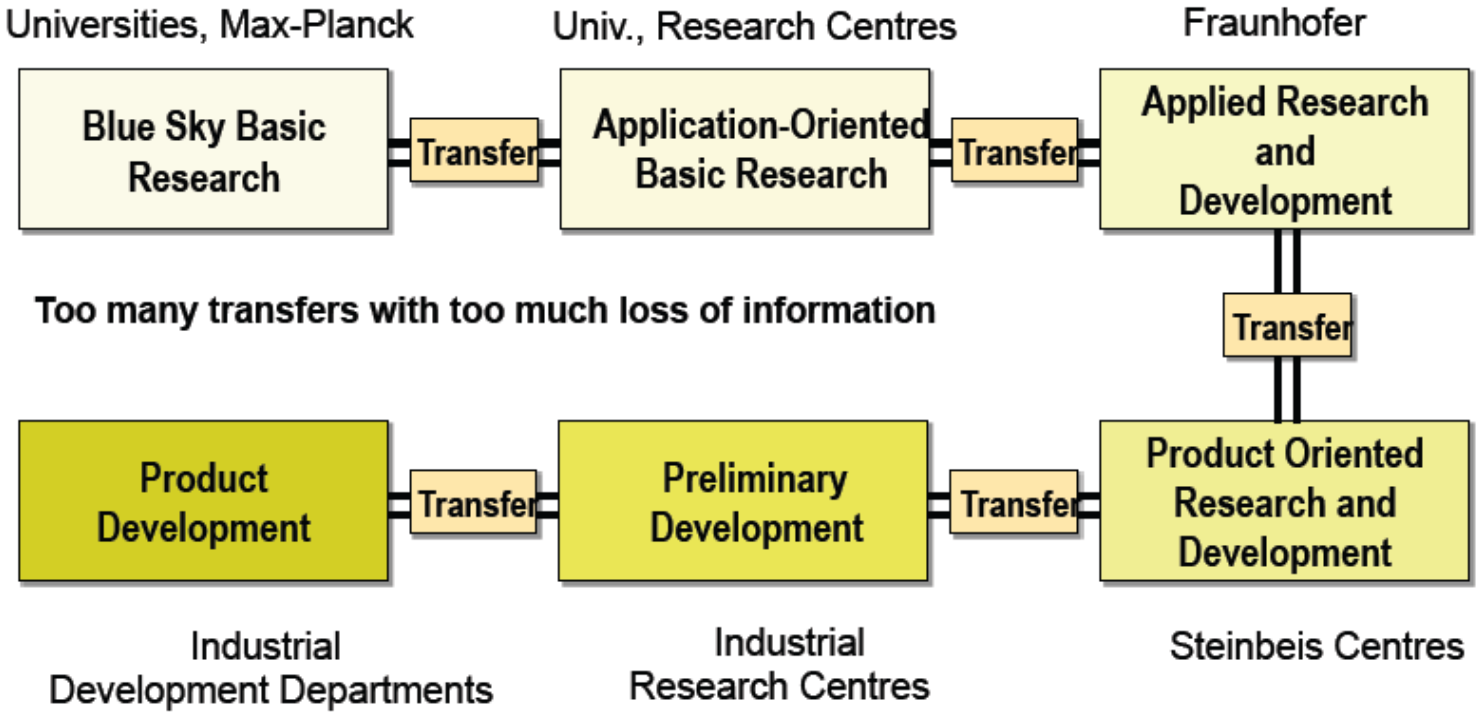

R&D programmes
Development methodology and framework
Distributed and embedded systems
IT security and quality
Man - machine interface
e-Document
Middleware, Knowledgebase and Graphical application
e-Security
Grid and IT Security Laboratory
Application development directions
PRODUCTS AND SERVICES
KNOWLEDGE BASE & COMPETENCIES

Why matrix ?

- Bidirectional direct transfer in nodes
  - application of research-results
  - generating new problems
  - more exactly: repeat rows as columns vice versa
- Hierarchy
  - Strict management in project
  - Coordinative management in research
  - Quality management - certified
- See:

  Wolfgang Wahlster: ICT 2020, The Research Program for Boosting Germany's Innovation Motor No. 1; ECSS 2008, Slides 16-17.

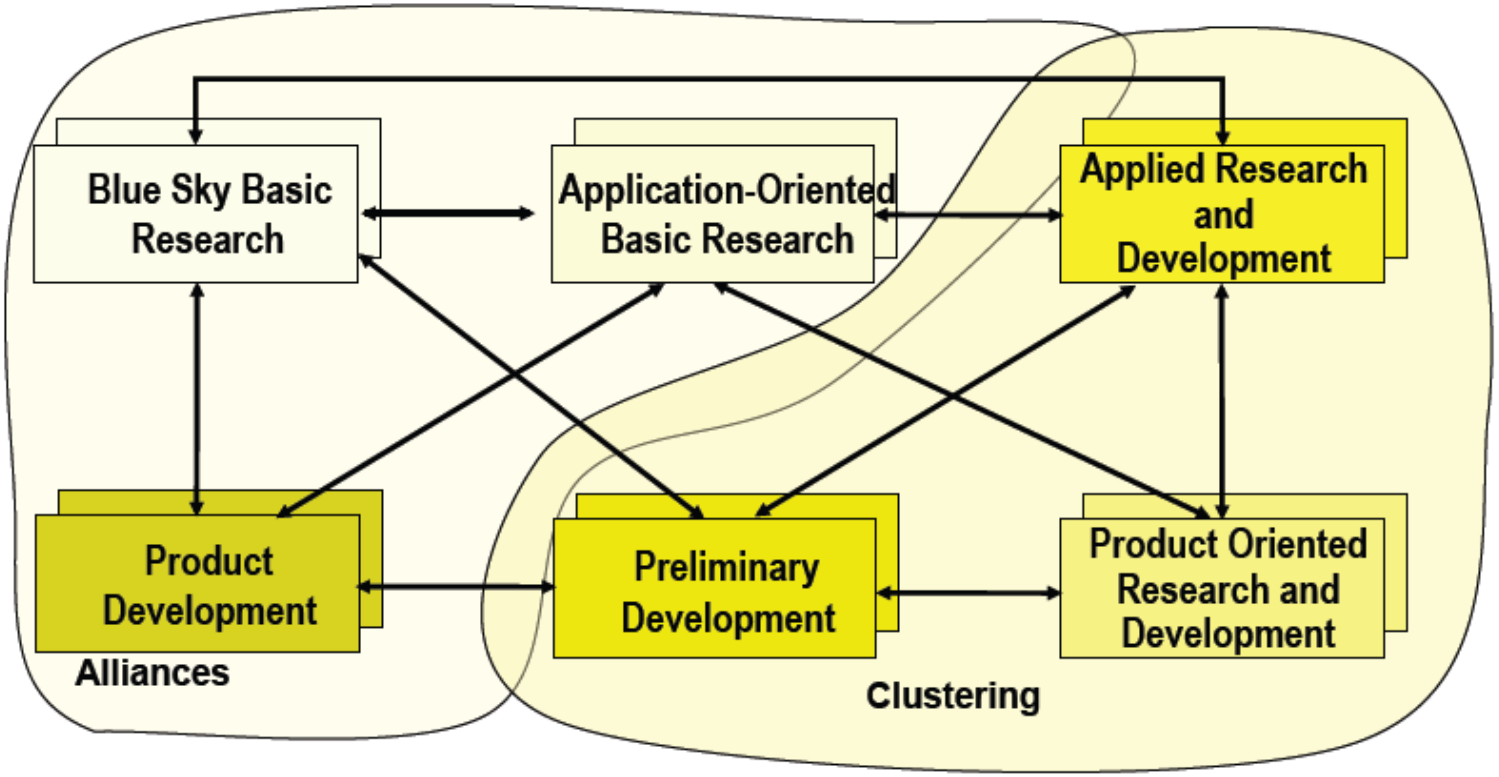
The Traditional Research Pipeline is a Roadblocker to High-Speed Innovation



1300 German Transfer Centers serve only as Contact and Marketing Centres

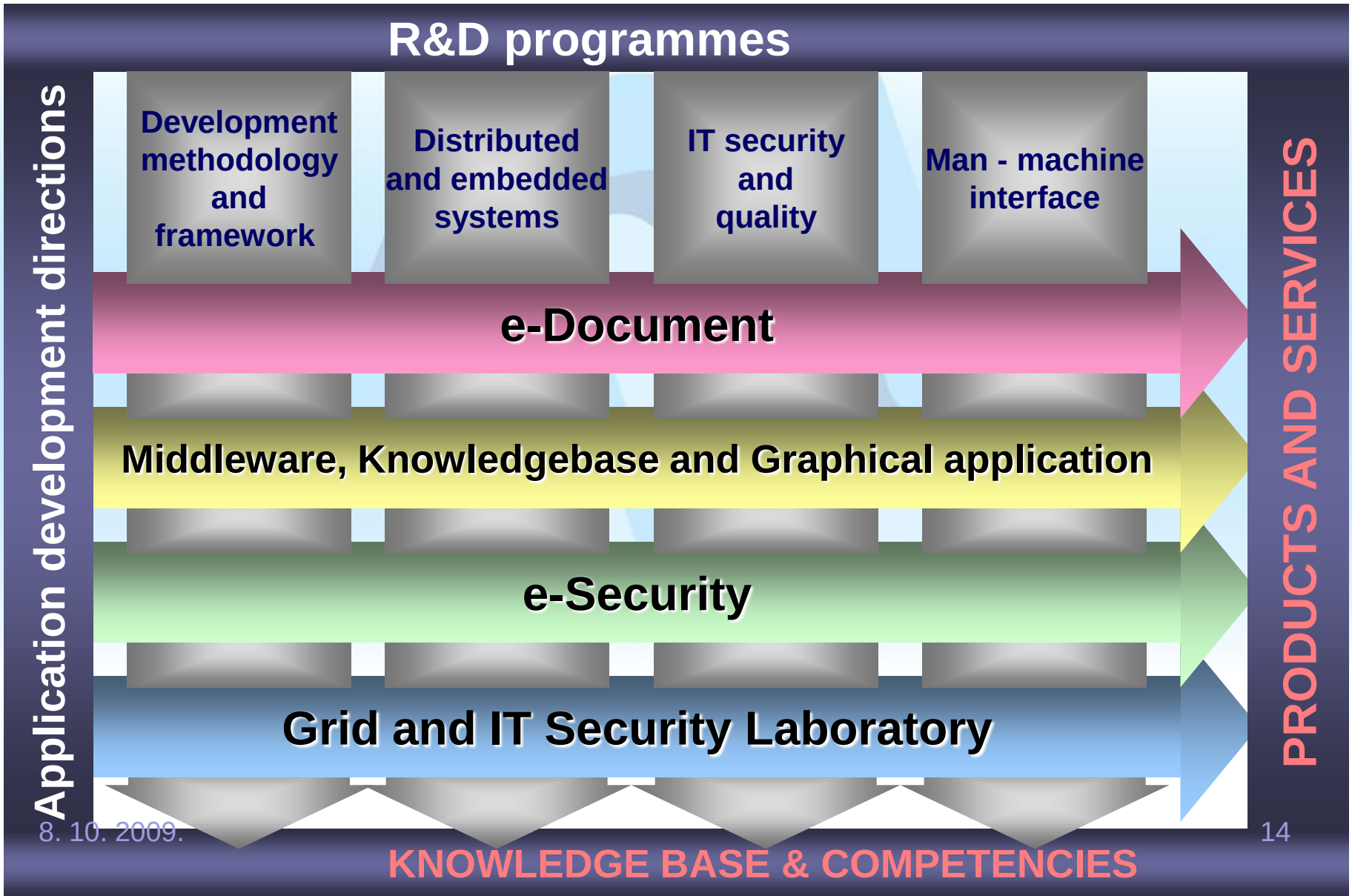
From: Wolfgang Wahlster: ICT 2020, The Research Program for Boosting Germany's Innovation Motor No. 1; ECSS 2008

Dynamic Innovation Networks
Minimize the Time-to-Market Factor



Combining basic and applied research with application development

From: Wolfgang Wahlster: ICT 2020, The Research Program for Boosting Germany's Innovation Motor No. 1; ECSS 2008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Embedded in the UNI

- People from departments – where is department's interest, what is the logo
- Complicated financial administration within UNI – how to implement department's interest
- IP management
- Very sensitive balance of interests

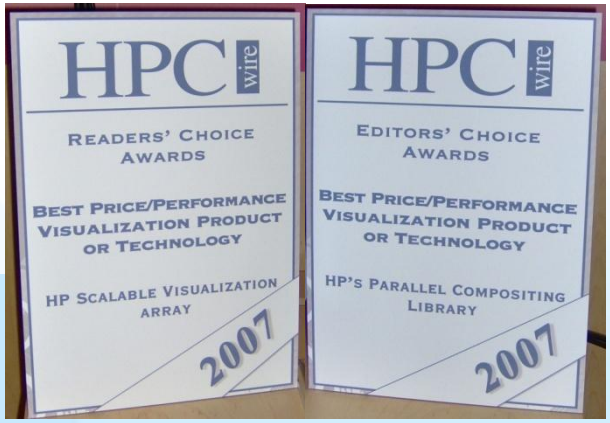
Infrastructure

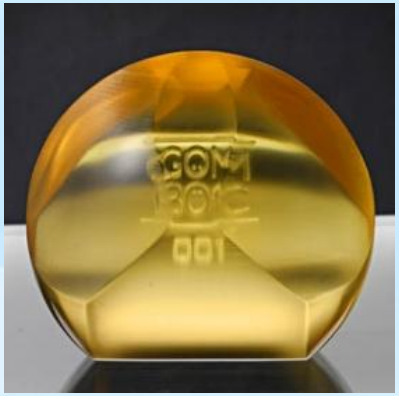
- Mostly at the beginning
- Building – only renewing with some changes: *project lab*
- Equipments, software
- Special equipments as partners' contributions (e.g. HP

Project lab

Highlights

- Dragon Medical with Nuance
  - technology for workflow
- Computer graphics with HP
  - 3D real time volume visualization
- GRID application in Architecture
  - in cooperation with ”Gomboc” inventor prof. G. Domonkos
  - estimation of the torsion of extremely large concrete beams
- SOA-based integration
  - semantic and higher level interoperability
  - need for multidisciplinarity
  - complex model-based technology





Side effects

- e-Government framework
  - THE NEW HUNGARY DEVELOPMENT PLAN 2007-13, Priority 6: **State reform**
  - Connectivity of autonomous sections
  - Similar to SAGA and others
- NESSI-HUNGARY
  - National Platform for Software & Services
  - ~ 90 organizations
  - Vision Document
  - Strategic Research Agenda

How to go on?

- Supported period finished
- Self-sustaining - not a reality yet
- Further support with higher percent from industry – promised by government
- Unfortunately
  - Crisis
  - Election in Hungary (next Spring)
  - Moving from University level to Faculty level

SOA-based integration

- State of the Art
  - Enterprise-level toolkits – different vendors
  - ESB
  - BPEL, BPMN
  - Ontology
- To develop
  - Common metamodels
  - Managing long-term processes
  - Complex test methodology and technology
  - Ontology-technology

Models in Law

- Are citizens able to keep in mind all the rules they ought to follow in their everyday life?
- Is the legal language understandable for the man in the street?
- Is the free text representation of the law exact enough to avoid multiple understanding?
- Is the legal system coherent and free from contradictions?

Models in Law (cont.)

- Formal representation
- Model checking
- Ontology (within a single Act at first)
- Generated text
- Language technology (future)
- **NO JUDGING MACHINE**

Summary

- Fastening the innovation chain – with more feedback
- Most problems in implementation of complex systems are not ICT-problems
  - need for multidisciplinary
  - need to penetrate other domains with IT, most fundamentally with model-based approach
- More and more complex systems
  - need for open architectures and open standards
  - users (society) must claim
  - cooperative vs. competitive behavior

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Thanks for your kind attention!

Péter Pázmány programme

Established by the support of the National Office for Research and Technology.