ICT RTD Audit - Latvia

ICT Research capabilities in LATVIA

Prof. Imants Freibergs
Past president, LIKTA

bonita

LIKTA
Latvian Information
and Communications
Technology Association

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Agenda

- ☐ Latvian ICT sector
- ☐ Programmes supporting ICT research and innovation
- ☐ Success rate in EC Framework programmes FP6/FP7
- ☐ ICT RTD Centres of Excellence
- ☐ ICT research areas
- ☐ SWOT table
- ☐ Barriers
- ☐ Recommendations

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Main Objectives of the RTD Audit

- Identify the <u>barriers and obstacles</u> to successful participation of Latvian ICT organizations in EU research programs

- Identify the <u>centres of excellence</u> and centres with development potential per **Framework Program FP7 – ICT** Theme Challenges and Objectives

- <u>Propose actions</u> that need to be taken at national and European levels to increase the participation of organisations carrying out ICT RTD in both the private and public sector.

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ICT sector stakeholders in Latvia

- ☐ **Governmental sector**: important Ministries for R&D policies and support are
  - ◼ Ministry of Economics
    - ☐ Incl. Investment and Development Agency of Latvia - LIAA
  - ◼ Ministry of Education and Science
    responsible for the Academic sector
- ☐ **Academic sector**:
  - ◼ Latvian Academy of Science
  - ◼ Latvian Council of Science: distribution of funding and coordination of research activities, science policy
  - ◼ Research institutes and Universities (ICT sector is prioritary in research programs)
- ☐ **Private sector**
  - ◼ ICT business sector, mostly SMEs
  - ◼ ICT Industry associations (**LIKTA**, LEtERA, LIA)

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Latvian ICT sector indicators

Number of ICT companies	~3000
those with >50 employees	73
Number of employees in ICT sector	~25000
ICT sector turnover (M EUR)	3800
ICT manufacturing (incl. Software development)	3.4%
ICT services	9.3%
Electronic communications	21.9%
ICT wholesale trade	65.4%
ICT sector profit (M EUR)	383
ICT sector added value as part of national GDP	4.2%
Latvian IT Cluster: products and services for <u>export</u>	
Turnover MEUR (2009)	76.6
Export MEUR	30.4
Employees	1900

CSB data 2007

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ICT education

- **Primary and Secondary schools**
  - European Computer Driver's License (ECDL) program

- **ICT specialist education**
  - 13 institutions of higher education
  - 10 professional high schools
  - annually graduating **1300** ICT professionals
    20% with higher degrees

- **Continuous professional skills upgrading courses**
  - Assisted by the Ministry of Economics and EC
  - 70 companies, 1438 participants in 2008

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Programmes supporting ICT research & innovation

- Financed by EU Structural Funds – ESF, ERDF
  - Operational Programmes *"Human Resources and Employment"*, *"Entrepreneurship and Innovation"*, *"Infrastructure and services"*
  - Total ICT research support for 2010-2013 is **70 MEuros**
- Financed or co-financed by the Latvian state budget
  - ICT support for 2010/2011 is **1.85 Meuros per year**
- Other support instruments and programs
  Regional funds, private initiatives
- Time frame 2007-2013
- Due to current crisis budget constraints, support programs will be curtailed and/or postponed

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Programmes supporting ICT research & innovation - 1

Name of support programme	Source of funds	Time frame	Budget MEeuros
Operational Programme: Infrastructure and Services			
Priority 1 – Infrastructure for strengthening human capital (IT infrastructure of schools, research institutions, etc.)	ERDF National	2013	512 90
Priority 2 - ICT Infrastructure and Services (electronic services, Internet)	ERDF National	2013	511 90
Operational Programme: Human Resources and Employment Priority 1 - Higher education and Science Priority 2 – Education and skills Priority 3 - Promotion of employment and health at work Priority 4 – Promotion of social inclusion Priority 5 – Administrative capacity building	ESF National	2013	551 106
Operational Programme: Entrepreneurship and Innovations Priority 1 – Science and innovations	ERDF National, public/private	2013	736 104 243

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Programmes supporting ICT research & innovation - 2

| Name of support programme	Source of funds	Time frame	Budget MEeuros
Program for Promotion of Business Competitiveness and Innovation	ERDF, National	2008 – 2013	166.7
Support for Competence Centre Creation	EU, National	2008 – 2013	60.8
Investment in products with high added value	ESF, ERDF	2007 – 2013	28
Innovation centre and business incubator development program (ICBUDP)	National	2008+	28.7
INTERREG IVC (Regional development)	ERDF, National	2007-2013	411
Swiss confederation financial instruments (SCFI)	Swiss government	2009-2010	39
Development of novel multifunctional materials, signal processing and information technologies for competitive knowledge-based products (national programme)	National	2010 2011	1.4 1.5

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Success rate in EC Framework Programmes

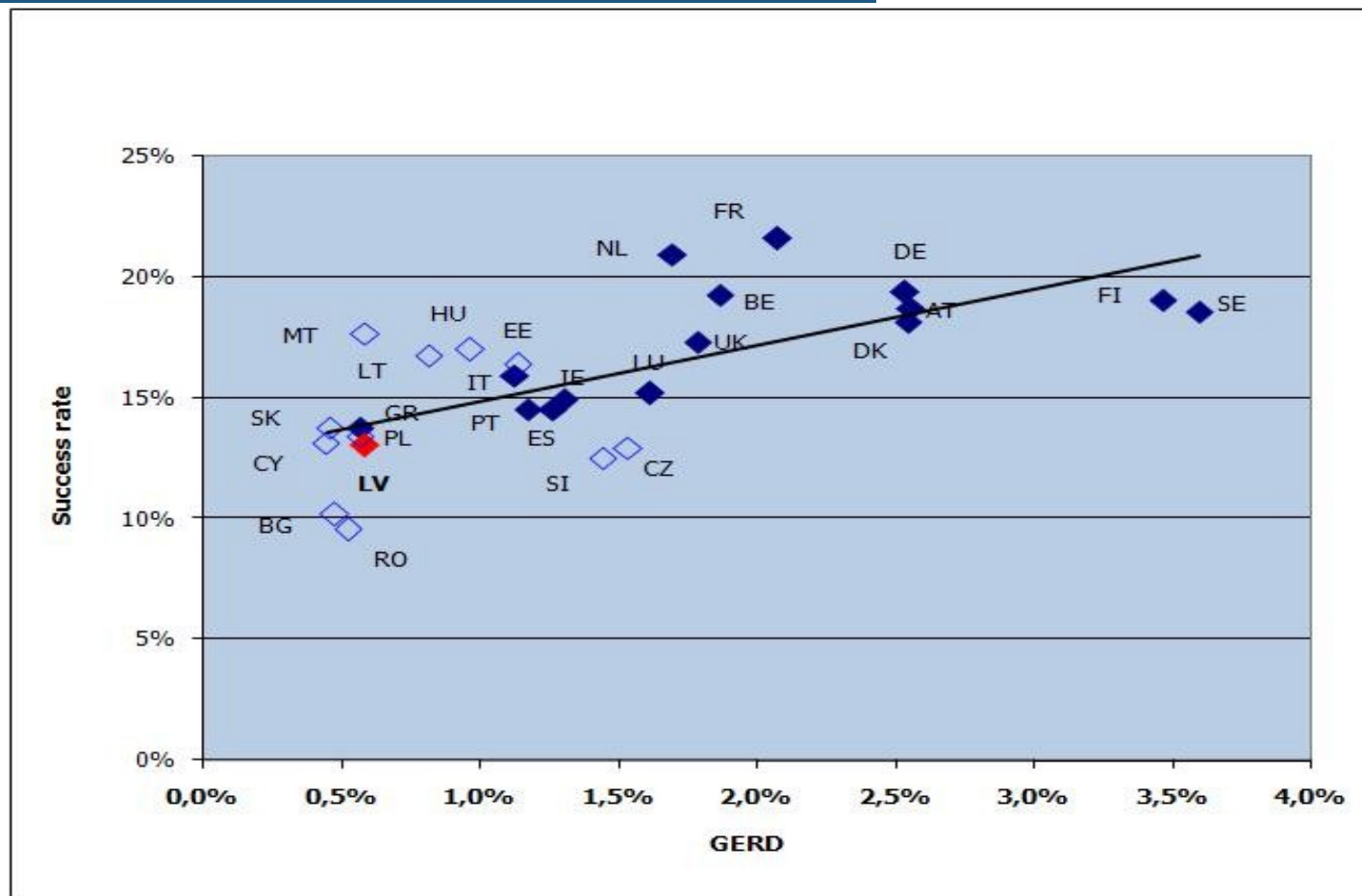|	EU Proposals		Latvian Proposals		Percentage of successful proposals	
	Total	Success	Total	Success	EU	Latvia
FP6 IST Priority	8383	1123	228	33	13.4%	**14.5%**
FP7 ICT Theme	4319	583	63	7	13.5%	**11.1%**

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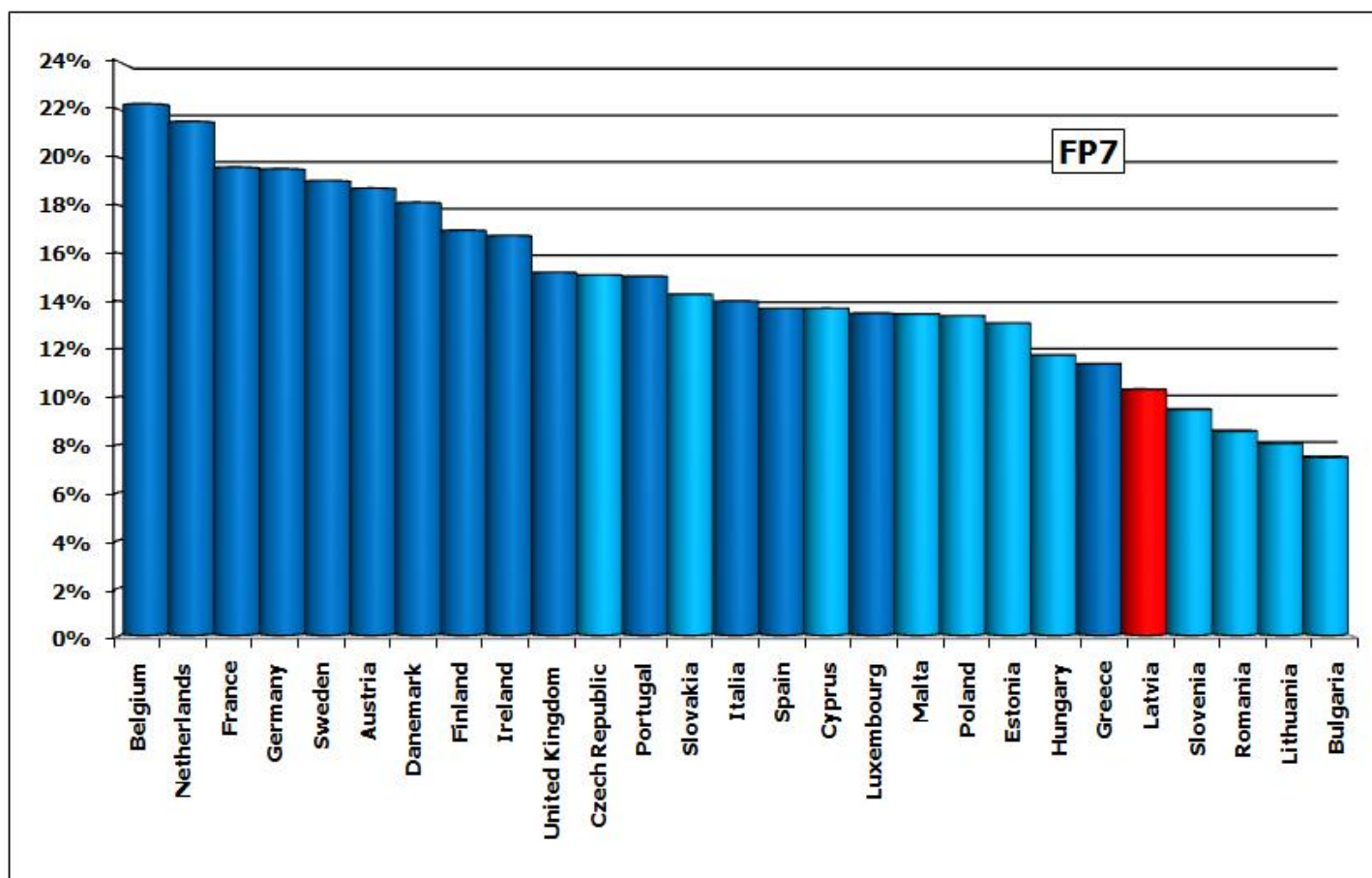# Success rate for the EU27 countries in FP6

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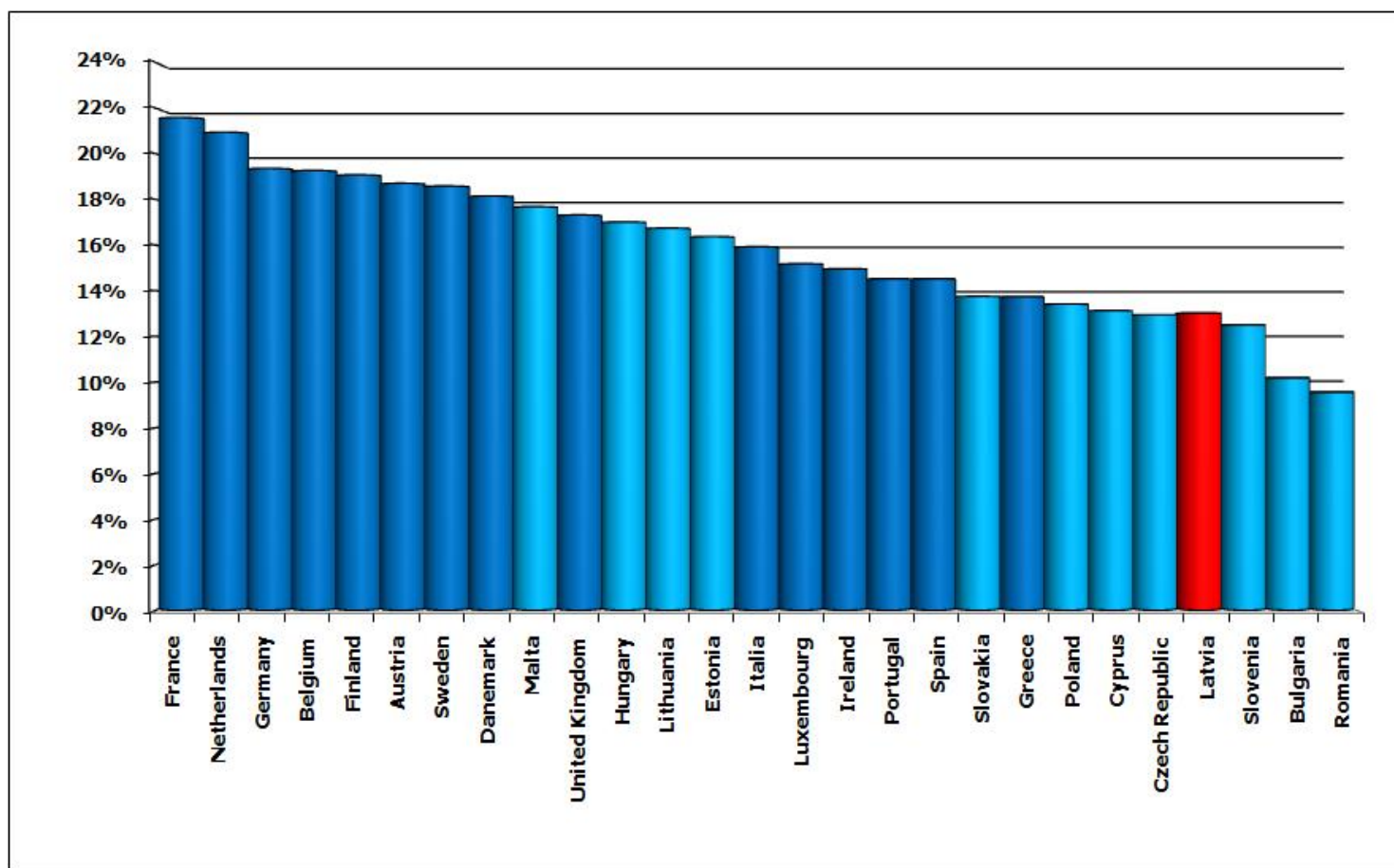
Percentage of GDP spent on R&D in Latvia
GERD

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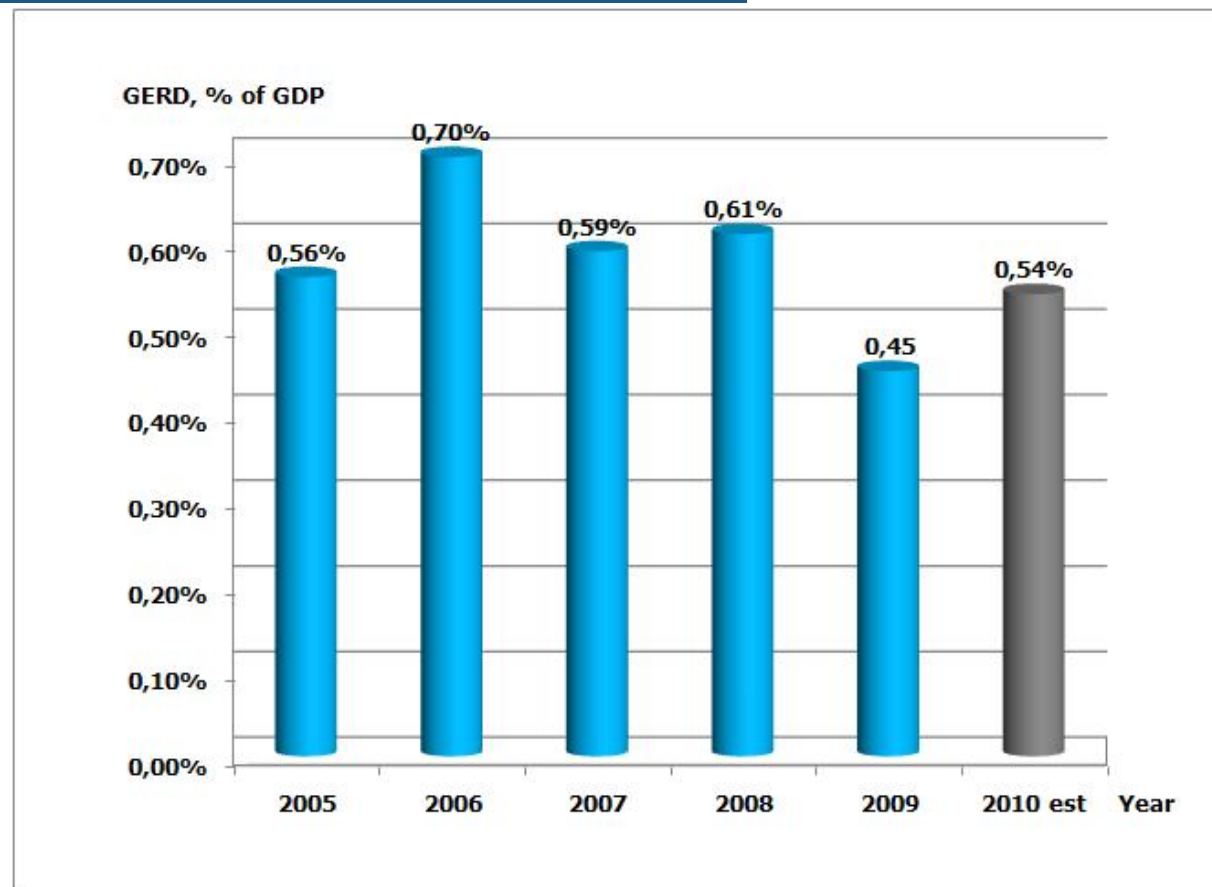
Success rate of FP6 IST proposals vs GERD for EU27 countries

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Success rate for the EU27 countries in FP7

FP6/FP7 Conclusions

- Latvia is not an active player in the European ICT research area as yet

- Latvia's contribution to the development of European ICT research does not fully correspond to its capabilities

- The Latvian government and the ICT community should take advantage of all opportunities available at the National and the EU levels

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Identification of ICT RTD Centres of Excellence

- The capabilities of Latvian ICT research organizations were evaluated with respect to their ability for integration into the FP7 – ICT Theme

- A total of 35 organisations have been identified

- Live interviews were carried out in order to assess RTD capabilities, technological expertise and human resources

- A consolidated list of 17 identified Centres of Excellence in Latvia with a proven track record was compiled

- A list of 18 potential Centres of Excellence was compiled

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Identified ICT RTD Centres of Excellence

Type of organization	Centres of excellence	Potential centres of excellence	Total number of organizations selected
Higher education and research institutions	12	5	17
Commercial organizations, including SMEs	5	11	16
Other organizations		2	2
Total number of organizations that completed Who is Who live interviews	17	18	**35**

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Centres of Excellence

- Department of Modelling and Simulation, Riga Technical University

- Distance Education Study Centre, Riga Technical University

- Faculty of Computing, University of Latvia

- Faculty of Electronics and Telecommunications, Riga Technical University

- Institute of Atomic Physics and Spectroscopy, University of Latvia

- Institute of Chemical Physics, University of Latvia

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Centres of Excellence (cont.)

- Institute of Electronics and Computer Science
- Institute of Mathematics and Computer Science, University of Latvia
- Institute of Polymer Mechanics, University of Latvia
- Institute of Solid State Physics, University of Latvia
- Priekuli Plant Breeding Institute
- Ventspils University College

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Centres of Excellence (cont. 2)

- **Ekodoma Ltd.**
Energy efficient buildings

- **Hanzas Elektronika Ltd.**
Electronic printed circuit boards, electromechanical components, subsystems, and complete systems

- **Lursoft IT Ltd.**

  National online register systems, full text search tools

- **Sidrabe Inc.**
Vacuum technological processes, development of deposition processes

- **Tilde Ltd.**
Language technologies, digital content, localization

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ICT Research areas

☐ **1. Digital content**

- ■ Technology-enhanced learning and access to cultural heritage
- ■ Semantic-based Knowledge and Content Systems
- ■ Access to and preservation of cultural and scientific resources
- ■ Digital libraries and technology-enhanced learning

  Intelligent content & semantics

☐ **2. Networked Business**

  Networked business and governments

  ICT for Networked Businesses

  Networked enterprise
  Applications and Services for the Mobile User and worker

☐ **3. Health**

  eHealth
  Integrated biomedical information for better health

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ICT Research areas (2)

☐ **4. Robotics**

> Embedded systems
> Advanced Robotics
> Cognitive systems, interaction, robotics

☐ **5. Networks**

> Broadband for all
> Secure networks
> Internet of the future

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The most appropriate FP7 Challenges

- Challenge 1. Pervasive and Trustworthy Network and Service Infrastructures
- Challenge 2. Cognitive Systems, Interaction, Robotics
- Challenge 3. Components, Systems, Engineering
- Challenge 4. Digital Libraries and Content

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SWOT table: Strengths

- S1. Policies and instruments exist supporting ICT RTD in Latvia
- S2. Organisations with strong ICT research background and international experience
- S3. Institutions with high level RTD expertise in areas related to ICT
- S4. Impressive number of SCI publications for some organisations
- S5. Good contacts with international partners for some organisations
- S6. Well organised ICT education system in higher education institutions
- S7. Well trained staff for programming and software development in research institutions and commercial organisations
- S8. Well established technological infrastructure for most of the organisations
- S9. Well-developed networking facilities
- S10. World-level expertise of researchers in some areas
- S11. Successful academic research activities in computing science, system modelling, quantum computing, etc.
- S12. Prospective investigations started in the areas of sensor networks, semantic web, computer linguistics, etc.
- S13. Established traditions and success of academic research in the areas of solid state physics, including nano-level physics

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SWOT table: Weaknesses

- W1. Fragmented instruments for ICT RTD support in Latvia, with excessive administrative overhead
- W2. No specific strategy for ICT RTD, nor for the ICT sector in general
- W3. Governmental strategic documents related to research, Information society and ICT lacking a European Dimension
- W4. Low level of cooperation for ICT RTD activities
- W5. Weak industry - academic relations
- W6. Low level of international cooperation of many organisations with plans to participate in FP projects
- W7. Lower quality of FP proposals with Latvian participants, compared to EU average
- W8. Insufficient experience in project coordination for FP6 and FP7
- W9. High average age of the leading researchers
- W10. Habitual and set ways of thinking and working
- W11. Poor knowledge of English in some organisations
- W12. Excessive workload of researchers in some organisations

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SWOT table: Opportunities

- O1. Prioritisation of e-education and ICT in government strategy documents
- O2. Stimulation of closer collaboration between academic institutions and the commercial sector
- O3. More active participation in various Framework programmes
- O4. Promotion of European science politics and European RTD cooperation
- O5. Development of the National Research and Education Network (NREN)
- O6. Joining the European Infrastructures
- O7. Regular infrastructure upgrading with the support of EU funds
- O8. Development of innovative ICT companies and research planning
- O9. Modernisation of training of ICT specialists

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SWOT table: Threats

- T1. Global economic crisis and its aftermath in Latvia
- T2. Importance of research not well understood by the public
- T3. Decreased funding for education and research
- T4. Little improvement of regulatory measures related to ICT research
- T5. Rise of competition on global and European scales
- T6. Brain-drain of scientists
- T7. Functional and moral depreciation of the existing ICT infrastructure
- T8. Regional inequality of infrastructure available to research institutions and companies

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General barriers for all types of organizations

Barrier	Actions level
No access to EU leading partnership networks	*National; EC*
No access to EU leading networks in specific (target) research areas	*National, EC*
No or minimal experience of participation in collaborative projects	*National*
No clear understanding about participation rules, conditions, financing schemes	*National, EC*
Not enough resources (staff, financial) to prepare qualitative project applications	*Internal, National*
Lack of necessary support to prepare projects (information, finances)	*National, Organizational*
Preparation, application and evaluation period too long.	*EC*

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Barriers specific to Academic sector and Higher education institutions

Barrier	*Action level*
Weak cooperation with industry sector in Latvia and abroad	*National, EC*
Participation in national projects (funded by EU funds) dominates over FP7 applications	*National*
Not enough (no dedicated) resources to follow up EU ICT research work programs and calls	*National*
Lack of orientation to research results and outcomes in national projects; this creates an inappropriate research project attitude/ culture	*National, EC*
Unclear future support for science, RTD and education in Latvia; this leads to low motivation to work on future projects	*National*
Brain-drain of young researchers	*National*
Some RES and HE can't find objectives and challenges in the current FP7 work program that would correspond to their main research priorities	*EC*

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Barriers specific to Industry and SME sector

Barrier	Action level
Companies do not have an RTD strategy or plans	*Organizational-Internal*
Participation in EU ICT research projects is not a target for company management	*Organizational-Internal*
Companies don't have clearly defined responsibilities for RTD and innovation	*National, Organizational*
Weak cooperation with academic sector inside Latvia and abroad	*National*
Strong focus only on obtaining financial support	*National, Organizational*
Importance of access to leading edge technologies and international experience underestimated	*Organizational, National*
Too much focus on short term goals and markets	*Organizational*
Development of services dominates over product and technology development	*Internal, National*
Advantages of registered patents and licenses questionable, practically no experience to register patents at EU level	*National, Organizational*
Insufficient participation in international / EU events and networking activities; this decreases opportunities to contact best consortiums.	*National, EC, Organizational*

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Recommendations at the Stakeholder/institutional level

- Identify strategic objectives of RTD
- Define clear responsibilities for ICT RTD
- Foster closer collaboration between commercial and academic sectors (e.g. BONITA project)
- Regularly follow latest information about ERA, FP7 work programme and calls
- Allocate resources for participation at ICT RTD international events

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Innovation transfer - BONITA project

- BONITA (Baltic Organization and Network of Innovation Transfer and Association)

- A mechanism of cooperation between the academic sector and ICT industry

- aims to foster <u>interregional development</u> by turning university research into business value

- Fosters knowledge and technology transfer

  - exchange of technical information between R&D workers

  - transmitting research findings, skills and competence

 - developing practical applications for scientific research

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BONITA – Mission

- ☐ analysis and adaptation of existing **transfer models**

- ☐ establishing **Showrooms** as a public window to research as implementation of the transfer model

- ☐ **transregional network** to link regional transfer structures on European level

- ☐ **training, education and staff exchange** to establish the transfer from science for regional development and to train the implementation of the model

- ☐ **communication** concepts and implementation to promote the value of science within a region and beyond

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BONITA Transfermodel

- ❑ Science institutions are structually not capable of the handling with the complex requirements of technology transfer.

- ❑ The Bonita Transfermodel brings together the institution's transfer capability with its structure.

- ❑ The Model is oriented towards the **ISO Standard 15504**

  - ■ International standard to perform assessments of business processes with emphasis on software development

  - ■ At present specific derivates of the standard arise in several domains (Automotive Spice, Enterprise Spice).

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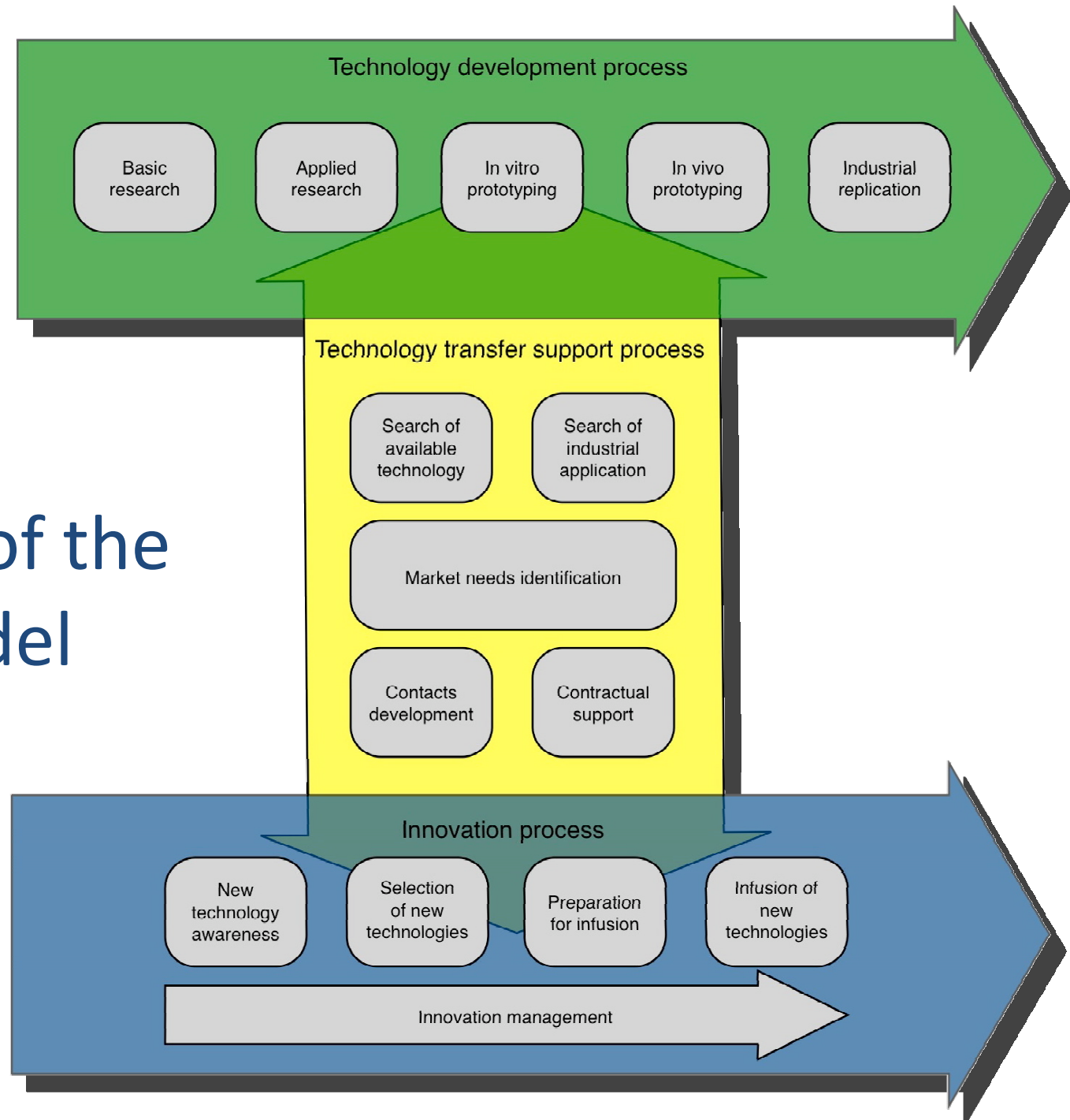
Recommendations at the National level

- Set education and science as top priorities
- Set ICT as a top priority
- Provide targeted and relevant information to potential proposal submitters
- Provide consultations on IPR, patents and licences
- Provide support for EU partner search
- Provide financial support for project proposal preparation
- Raise the awareness of ICT RTD achievements and excellence areas in Latvia and abroad

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Recommendations at the National level -2

- **Focus research efforts on specific promising areas**
  - ☐ Computing science, incl. <u>quantum computing</u> , system modelling
  - ☐ Development of <u>sensor networks</u>
  - ☐ Development of the semantic web and other research related to <u>computer linguistics</u>
- **Support research in some specific areas closely related to ICT**
  - ☐ solid state physics, including nano-level physics, and optical research

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Recommendations at the National level -3

- Promote Latvian ICT RTD excellence centres to leading EU partnership networks in relevant research areas
- Establish support mechanisms to stimulate industry-academic cooperation (such as BONITA, or the ICT Competence centre)
- Create a specialised course for PhD students and young scientists

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Recommendations at the EC level

- Introduce more possibilities for the organizations without previous experience
- Promote usage of completed FP project databases
- Provide targeted training
- Promote ICT RTD excellence centres from Latvia to leading EU partnership networks
- Include high competence areas of ICT RTD excellence centres of Latvia in FP7 future calls and in the next Framework programme

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Conclusions

- There are a number of organizations in Latvia with definite ICT research capabilities, adequate infrastructure, and experience in EU research projects
- Several domains of high ICT RTD competence should be emphasized, such as quantum computing, language processing and semantic analysis, and advanced digital signal processing, among others
- Targeted actions need to be taken at organizational, national and EU levels

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Conclusions (cont.)

■ The following <u>obstacles</u> are prevalent:

☐ Lack of clear long term and mid-term RTD strategy in many organisations;

☐ Low level of cooperation between the academic and industry sectors for ICT RTD;

☐ No clear understanding about Framework program participation rules, conditions, or funding schemes;

☐ Lack of resources (human, financial) for qualitative FP project application preparation;

☐ No access to EU leading partnership networks.

LIKTA contacts

http://www.likta.lv/EN

http://www.bonita-project.eu

Mara Jakobsone, Vice-president LIKTA
mara.j@dtmedia.lv

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LIKTA
Latvian Information
and Communications
Technology Association