R & D in ICT - Slovakia

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R & D in General

The Setting

R&D is in the portfolio of the Ministry of Education but other ministries have limited funds for financing research as well. There are three types of financing R&D from the public resources in Slovakia. First it is financing research "bottom up" via the Slovak Research and Development Agency (www.apvv.sk) established in 2002. The second type is financing research "top down" via Research Programs of the Slovak Government, also established in 2002. There were ten such programs, lead by Research Concils. One of them was the program 'Towards Information Society'. The Research Programs are supervised by the Ministry of Education. The third type of financing is via specific order by some ministry.

Main R&D institutions are institutes of the Slovak Academy of Sciences (66), close to 30 universities and several tenths of private R&D institutes which mostly stem from former research institutes established by various ministries to perform applied research in their area of interest.

Some statistics

The following tables bring statistics collected by the Statistical Office of Slovakia.

R&D Personel

Employee type	FTE [1)]					
	2000	2001	2002	2003	2004	2005
Total	15 221,0	14 422,5	13 631,3	13 353,6	14 328,9	14 403,60
Researchers	9 955,0	9 584,8	9 181,1	9 626,5	10 717,8	10 920,60
Technicians	3 596,8	3 323,2	3 032,2	2 483,3	2 402,5	2 244,80
Support personell	1 669,2	1 514,5	1 418,0	1 243,8	1 208,6	1 238,20

R&D expenses (in thousands of SKK)

R&D Spending	2000	2001	2002	2003	2004	2005
Total	6 085 506	6 466 807	6 332 656	7 016 275	6 965 430	7 503 386
Equipment	513 925	502 654	528 052	777 150	742 334	798 574
Other	5 571 581	5 964 153	5 804 604	6 239 125	6 223 096	6 704 812
Source of financing						
- public resources	2 592 146	2 667 989	2 792 813	3 566 858	3 978 389	4 540 597
- private resources	3 493 360	3 798 818	3 539 843	3 449 417	2 987 041	2 962 789
Fraction of GNP(%)	0,65	0,63	0,57	0,58	0,51	0,51

LICENCIES [1)]

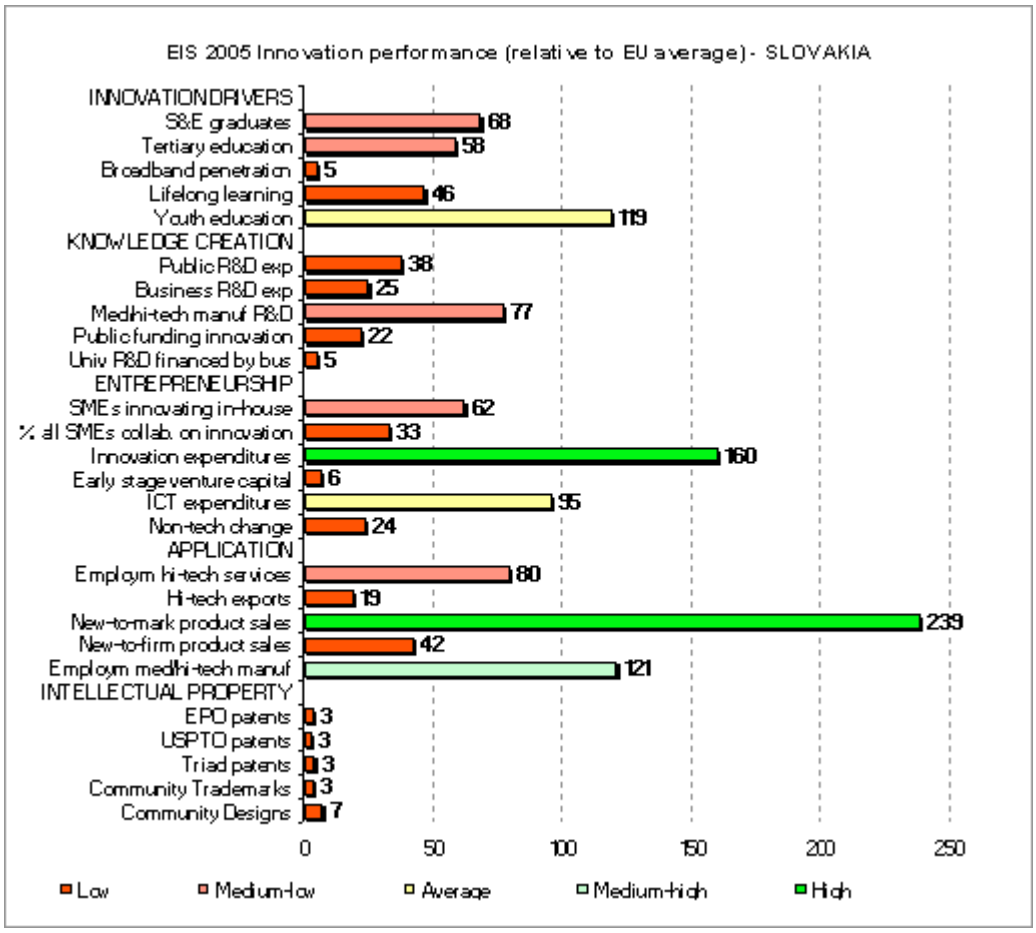
Indicator	2000	2001	2002	2003	2004
Number of new licence agreements					
Licences bought	36	46	49	47	56
Licences sold	4	13	5	6	11
Cost of licences (thousands SKK)	70 215	215 727	101 841	88 759	349 002
Profit from licences (thousands SKK)	1 222	11 097	5 382	1 929	8 404

INNOVATIONS

Indicator	2001	2003
Fraction of enterprises with innovations (in %)	19,5	19,4
Small enterprises (10-49 employees)	15,1	14,6
Medium enterprises (50-249 employees)	24,4	24,2
Large enterprises (250 and more employees)	46,8	47,5
Spending for innovations in %	5,7	3,6
Structure of spending for innovations in %		
Internal R&D	6,8	6,6
External R&D	2,5	2,8
Equipment	77,0	60,9
External know-how	4,7	22,1
Cost of starting production	9,0	7,6

According to the TrendChart of the Innovation Policy in Europe http://trendchart.cordis.lu
The indicators for Slovakia are as follows.

SK	Value	Rank	Out of no. EU countries
2005 EIS Summary Innovation Index (SII)	0.21	22	25
EIS Composite Index for Innovation drivers	0.26	20	25
EIS Composite Index for Knowledge creation	0.12	24	25
EIS Composite Index for Innovation & entrepreneurship	0.24	23	23
EIS Composite Index for Applications	0.43	12	25
EIS Composite Index for Intellectual Property	0.01	23	25
Index for domestic innovation demand	0.47	9	24
Index for innovation governance	0.30	21	22
Percent strategic innovators	3	15	19
Percent intermittent innovators	6	17	19
Percent technology modifiers	4	15	19
Percent technology adopters	7	13	19
Percent non-innovative firms	80	18	19



Main problem.
Slovakia ranks at the bottom of EU statistics on R&D in most of the indicators.

R & D in ICT

The Setting
The setting is the same as for R&D in general. In addition, the R&D policy could draw on the National Strategy for Information Society. In 2002 the Government approved the Research Program BIS (Towards Information Society) and its Research Board was formed. Initially the board started calls in five areas:

- Tools and methods for information society
- Informatization of education
- Knowledge management and intelligent interfaces
- Digital public administration
- Information and communication infrastructure and components
– Utilization of ICT and new generation network platforms in education
– Intelligent speech communication interface– Model of integrated e-services in public administration
– Open source infrastructure
– Convergence of ICT networks and services in communication infrastructure of SR

– Tools for acquisition, organization and maintenance of knowledge in environment of heterogeneous resources
– Tools for integration and distributed use of geospatial information
The last two are running till 2007. The first five already finished with very positive evaluation by the reviewers. Besides achieving good technical results the Research Council succeeded in bringing to cooperation main players in respective areas in Slovakia and thereby catalysed concentration of scattered research capacities.

Up to 20 projects in ICT were financed via the Slovak Research and Development Agency, mostly small and medium sized projects. Slovak participation in ICT in FP6 was discouraging.

Main players and key areas
The research capacity in ICT has decreased during the last 15 years, mainly due to brain drain. Many researchers went abroad and/or to IT companies. Only five of the Slovak universities have R&D in ICT (Comenius University and Slovak University of Technoilogy in Bratislava, Safarik University and University of Technology in Kosice, and University of Zilina). At te Slovak Academy of Science there is only one institute – Institute of Infomatics – having R&D in ICT. There is a number of smaller institutions with some ICT related R&D (mostly closer to the D than to the R).

Slovakia has a long history of research in theoretical computer science. In recent years research teams in other areas formed (computer graphics, artificial intelligence, security, software engineering). The tradition of hardware design was interrupted but microelectronics and chip design are revitalized. One can also recognize strength in the telecommunications area and industrial informatics. Grid computing and semantic web belong to the newly added areas of competence.

Main problems
The main problem of R&D in ICT can be seen from the statistics above. The R&D area is neglected and underfinanced for too many years by now. This lead to reduction in the number of researchers and brought many teams to critical numbers. The new instruments put in place in 2002 promised improvement but unfortunately were not fully implemented. In fact the Research Programs were practically stopped in 2004 and no new projects could be open. Many administrative changes resulted in the interruption/delay of the flow of finances to research teams. Plans of the new government to improve the situation by increasing the R&D spending to 0.8% by 2010 (including public, private and EU funding) does not give much hope. Additional problem is the lack of interest of local industry in research. Multinational companies tend to have the research done in their home countries. There is some hope however, that with the economy on the increase, the R&D funding in absolute numbers may increase.

Conclusion
The potential of IT STAR may be in facilitating cooperation and thus concentration of capacities in particular areas. This may lead to stronger teams with a better chance to succeed in solving problems and getting grants.