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Report on the training course on Technology Management and Strategic Alliances (Ljubljana, 13.11.2000 – 17.11.2000 carried out by ICS/UNIDO and IER)

A five – day Course on Technology Management and Strategic Alliances took place on 13. November – 17. November 2000 at the Institute for Economic Research in Ljubljana. The course was carried out by Mr. Giovanni Abramo (Universitá di Roma – CNR), Mr. Marco Ferretti (Network consulting group – Universitá di Napoli), Mr. Raymond Tavares (ICS – UNIDO) and two Slovene consultants, Mr. Miro Urban (Welding Institute) and Mr. Uros Kravos (ISKRA Avtoelektrika Nova Gorica). There were 24 representatives of Slovene companies attending the seminar.

1. Profile of the participants

Table 1 presents the basic characteristics of the 24 participating companies.

Table 1: Annual sales turnover, exports per year, number of employees, type of a firm and ownership structure of the participating companies

	Name of the company	Annual sales turnover (v 000 SIT)	Exports per year (v 000 SIT)	Number of employ - ees	Branch	Ownership
1	O'KEN d.o.o.	6.000	0	1	Consulting	Private
2	Primc-Kranj, d.o.o.	30.000	0	4	Machinery	Private
3	Iskra Tela	650.000	330.000	100	Electronics &automation	Private&funds
4	MA-tisk d.d.	800.000	250.000	130	Printing	Private
5	Hipot-Hyb d.o.o.	1.100.000	800.000	130	Electronics, measurement systems	Private&funds
6	Iskra Zaščite d.o.o.	1.110.000	800.000	50	Electronics	Private
7	Chemistry Institut	1.248.040	10.294	186	R&D	State
8	Gradbeni inštitut ZRMK d.d.	1.390.753	9.080	76	Engineering Institute	Private
9	Mitol d.d.	2.000.000	8.000	96	Glue industry	Private&funds
10	Iskra Sysen d.d.	2.000.000	1.200.000	130	Electronics, measuring instruments	Private&funds
11	Konus-Konex d.o.o.	2.200.000	1.600.000	176	Production of power transmissions and conveyor belts	Private
12	Primat d.d.	2.342.002	1.246.072	292	Metallic industry	Private
13	Pinus tki, d.d.	2.561.217	753.579	150	Pesticide industry	Private
14	Aero Celje	3.673.474	2.165.841	468	Chemical, graphical & paper industry	Private&funds
15	Institut "Jožef Štefan"	4.816.719	109.775	700	Innovation Relay Centre	State
16	ETI elektroelement d.d.	7.471.678	5.902.625	1008	Electro industry	Private&funds
17	Elektronika Velenje d.d.	7.843.027	7.116.158	461	Electronics, TV sets	Private
18	Premogovnik Velenje d.d.	21.326.649	0	2822	Mining	State

19	SŽ ACRONI d.o.o.	24.441.524	14.815.602	1475	Steel	State
20	Iskratel	30.824.123	8.774.000	1036	Telecommunications	Private&funds
21	Lek d.d	41.664.000	33.331.200	2400	Pharmaceutical industry	Private&funds
22	Krka d.d.	50.900.000	38.000.000	3200	Pharmaceutical industry	Private&funds
23	Gorenje d.d.	78.000.000	71.400.000	4.280	Electric household appliances	Private&funds
24	IER			24	research	

The average annual sales turnover of these companies was 12.539.095.913 SIT (124.679.290 DEM[1]) in year 1999. The minimum annual sales turnover was 6.000.000 SIT (59.659 DEM) and the maximum 78.000.000.000 SIT (775.573.029 DEM).

The average annual sales turnover per employee was 13.050.656 SIT (129.766 DEM). Companies with the biggest sales turnover per employee are: Iskratel (telecommunications) with 29.753.014 SIT (295.841 DEM) per employee, Iskra Zaščite d.o.o. (electronics), Mitol (glue industry), Gorenje (electric household appliances) and Gradbeni inštitut ZRMK (engineering institute). On the other hand, companies with the lowest sales turnover per employee are: O'KEN (a one – person consulting company) with 6.000.000 SIT (59.659 DEM) per employee, Ma – Tisk (printing) and Iskra Tela (electronics and automation).

Table 2: Annual sales turnover and annual sales turnover per employee

	Average	Minimum	Maximum
Annual sales turnover	12.539.095.913 SIT (124.679.290 DEM)	6.000.000 SIT (59.659 DEM)	78.000.000.000 SIT (775.573.029 DEM)
Annual sales turnover per employee	13.050.656 SIT (129.766 DEM)	6.000.000 SIT (59.659 DEM)	29.753.014 SIT (295.841 DEM)

The average number of employees per company was 922 in year 1999. Six of these companies are small (0 – 125 employees), 9 are medium sized (125 – 500 employees) and 8 are big (500 and more employees) companies.

Table 3: Size distribution of the participating companies according to the number of employees

Company size	Number of companies	Average	Minimum	Maximum
Small (0 – 125 employees)	6	55	1	100
Medium size (126 – 500 employees)	9	265	130	468
Big (500 and more employees	8	2.115	700	4.280
Total	23	922	1	4.280

Among the participating companies 19 companies export their products to foreign markets. Average export of these companies was 9.431.111.300 SIT (93.775.841 DEM) in 1999, which

[1] The exchange rate is official exchange rate from the 30. December 1999 (1 DEM = 100,5708 SIT).

is on average 51 % of their annual sales turnover (if we exclude both research institutes and the engineering institute the average export is 59 %). Companies that got more than three quarters of their sales revenues from export are: Gorenje (electric household appliances) 92%, Elektronika Velenje d.d. (Electronics, TV sets) 91%, Lek d.d (a pharmaceutical company) 80%, ETI elektroelement d.d. (electro industry) 79% and Krka d.d. (a pharmaceutical company) 75%. The largest export markets for these firms are EU countries and Ex – Yugoslavian countries, then follow USA, East European Countries, Ex – Soviet Union and other.

According to the classification of companies by their activity (branch) the structure of participants is quite diverse. The most numerous are companies from the electronics industry. There are also two state research & development institutes.

2. Research activity

All of the companies, except two, have their own research department. The average expenditure per year for research is 1.044.269.882 SIT (10.383.430 DEM) per company i.e. 8,6 % of their annual sales turnover.[2] The maximum (absolute) amount of money was spent on research by Krka d.d., a pharmaceutical company, i.e. 5.599.000.000 SIT (55.672.222 DEM). Whereas the largest share of sales turnover allocated to research was 50 % in Primc Kranj, a small (4 employees) machinery company. Above average percent of resources has also been allocated to research by: Iskra Sysen (electronics, measuring instruments company), the telecommunication company and both pharmaceutical companies. The average share of employees working in research in these companies is 10 %, with the highest share in the telecommunication company (38,6 %), in Primc Kranj, which also has the highest sales turnover allocated to research and in electronics (Iskratel and Iskra Sysen).

Table 4: Absolute and relative expenditure for research and the share of employees working in research

	Average	Minimum	Maximum
Expenditure for research per year in sit (DEM)	1.044.269.882 (10.383.430)	6.057.000 (60.266)	5.599.000.000 (55.672.223)
Expenditure for research in annual sales turnover (%)	8,6 %	0,24 %	50,0 %
Percentage of employees in research (%)	10,1 %	1,5 %	38,6 %

3. Technology strategy

The most common source of technology of these companies is internal development of new products, followed by purchase of technology (licensing) and technology transfer from Western Europe and USA. Only one company mentioned the possession of a patent (machinery) and two the long term cooperation with R&D institutions. Among arrangements for technology upgrade companies mentioned internal and external R&D, the purchase of

[2] In the calculation of expenditures for research Institute Josef Stefan and Chemistry Institute, which are Research Institutes, are not included.

modern (new) equipment/elements, participation in fairs, seminars, education & training courses, interaction with customers and suppliers, etc.

The majority of the companies stated that they have their long – term corporate strategy and technology strategy (the later a few less).

Table 5: Corporate strategy and technology strategy

	Yes	Partially	No	Undefined
Corporate strategy	15	4	1	3
Technology strategy	12	5	3	3

The most common elements of technology strategy are: quality improvement, new product development and business alliances, followed by process improvement, acquiring new knowledge and product improvement. On the other hand, technology acquisition, competitive benchmarking, contract research, yield improvement and rapid sales growth are less frequently used.

Table 6: Elements of technology strategy

Elements of technology strategy	Number of companies	Percentage of companies
Technology acquisition	6	30 %
Product improvement	13	65 %
Process improvement	14	70 %
Quality improvement	15	75 %
Yield improvement	7	35 %
Waste reduction	9	45 %
New product development	15	75 %
Increase market share	11	55 %
Rapid sales growth	7	35 %
Increase export sales	10	50 %
Business alliances	15	75 %
Competitive benchmarking	6	30 %
Intensive skill development	11	55 %
Acquiring new knowledge	14	70 %
Contract research	6	30 %

4. Interaction with other departments

The interaction with other departments seems to be quite high, especially with production, R&D and marketing, whereas interaction with personnel is less frequent (when needed).

Table 7 presents the most frequent information that different departments provide.

Table 7: Kind of information that different departments provide to one another

Production	R&D	Marketing	Personnel
• Current problems/results, • Production capacity, • Production plan, • Production costs, • Feasibility of production, • Quality of products, • Development needs	• Development plan, • Improvements of existing products, • Undergone projects, • Incompatibilities, corrections, • Research methods, • Research results, • Technology development, • Transfer of know–how, • Strategic management, • New technologies, • Technological trends	• Market demand, trends, • Customers' remarks/claims of major customers, • Sales figures, • Conditions of sale, • Information about suppliers, • Sales forecast, • Competition, • Target market	• Personnel's management, • Specific demand for workers, • Availability of needed manpower, • Information about seminars and education, • New personnel,

5. Technology management

Only 15 companies answered the question about monitoring new technologies. Among them 9 companies – 60% - has arrangement(s) for monitoring new technologies. According to the size of a company (the criteria is number of employees) small and large companies are monitoring new technologies more often, i.e. 27% of companies monitors new technologies, whereas only one (7%) medium sized company has such arrangements.

Table 8: Companies that have an arrangement for monitoring new technologies according to the size of a company

Size of a company	Number of participating companies	Number of companies with monitoring NT	Percentage of companies
0 – 125 employees	6	4	66,7 %
126 – 500 employees	9	1	11 %
501 and more employees	8	4	50 %
Total	23	9	39 %

Among the four possible technology management tools companies most frequently use the SWOT analysis and secondly, technology forecasting (foresight). Technology audit and benchmarking are less common.

Table 9: Technology management tools

Technology management tools	Number of companies	Percentage of companies
Benchmarking	6	30 %
Technology audit	7	35 %
Strength and weakness analysis	15	75 %
Technology forecasting	9	45 %

6. Conclusions and follow up activities

The content of the seminar was new for practically all participants having predominantly technical educational background. They expressed their interest for the participation in the similar training courses. Because the majority of the participants came from companies from Central Slovenian region there is a potentially high demand for such courses in other Slovenian regions (Podravje, Coastal area).

The participants showed overall satisfaction with the training course. The weakness of the course was its duration, because most of the participants were not able to attend the course all five days. The duration of the course was also the barrier for other potential companies that expressed interest in the course but were not able to attend it because of its length.

IER will stay in close contacts with the participants of the seminar and companies in data base regarding the needs of organising similar training courses.

As regards the follow up activities there is a specific market "niche" for the companies (about 120) being under restructuring programme of Slovenian Development Agency. This Agency is going to privatise the companies and is looking for foreign strategic partners and investors. These companies need special training courses at all management levels. At the same time they have a necessity to engage "crisis managers" for restructuring and EU adjustment of the companies in the integrations process. One of the key problems is adjustment to environmental acquis communautaire. The participants proposed several other topics: **management of innovation** in SMEs (new generation of innovation processes, leverages and obstacles to innovation, **strategic outsourcing** (cost and performance, selection of providers), **industrial espionage, crisis management.**

The list of participants of training course »Technological Management and Strategic Allieances«

Ljubljana, November 13-17, 2000

	Company	Participants
1	O'KEN d.o.o.	Niko Osolnik
2	Primc-Kranj, d.o.o.	Niko Primc
3	Iskra Tela	Branko Cvetkovič
4	MA-tisk d.d.	Branko Piletič
5	Hipot-Hyb d.o.o.	Darko Belavič
6	Iskra Zaščite d.o.o.	Andrej Pirih, Borut Eržen, Žigo Hribar
7	Chemistry Institut	Mateja Jeras
8	Gradbeni inštitut ZRMK d.d.	Vladimir Gumilar
9	Mitol d.d.	Lilijana Kocjan Žorž
10	Iskra Sysen d.d.	Jurij Curk
11	Konus-Konex d.o.o.	Alenka Ribič
12	Primat d.d.	Beno Popovič
13	Pinus tki, d.d.	Branko Petrovič
14	Aero Celje	Ludvik Stepančič
15	Institut "Jožef Štefan"	Mirjana Oblak
16	ETI elektroelement d.d.	Mitja Koprivšek, Viktor Martinčič
17	Elektronika Velenje d.d.	Branko Mandelc
18	Premogovnik Velenje d.d.	Aleksander Trupej, Marijan Lipičnik
19	SŽ ACRONI d.o.o.	Boštjan Pirnar
20	Iskratel	Naim Maloku
21	Lek d.d	Tomaž Lagonder
22	Krka d.d.	Mihael Florjamič
23	Gorenje d.d.	Boro Jerabek
24	IER	Sonja Uršič