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European Space Agency

Assessment of potential space suppliers in the Czech Republic

Presentation

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Added comment from Iguassu Software Systems :

Apart from this page, this is the original presentation from Nodal Consultants

The company referenced in the presentation as “Science Systems” (on slides number 6, 8, 12, 16, 18, 19, 21, 24) has now been renamed to

“IGUASSU SOFTWARE SYSTEMS A.S.”

Contents of the presentation

- **Aim, scope and study methodology**
- **Assessment of the Czech space industry**
  - **Czech space achievements**
  - **Space potential**
  - **Company characteristics**
  - **Summary assessment**
- **Recommendations**
  - **Space projects**
  - **Key success factors**
  - **Action plan**

Aim and scope of the study

- ESA needs an objective assessment of the possible role of the Czech Republic in the European space domain
- The aim of the study was to provide ESA with :
  - evidence of the potential of industrial and scientific space activities in the Czech Republic
  - recommendations for the development of the Czech space industry
    - Czech organisations most likely to participate in ESA programmes
    - key success factors and actions to be led
- The scope of the space activities includes industry as well as related service activities (according to the official ESA classification)

The study methodology involved contacts with 133 Czech companies and institutions

Describe the Czech Republic with macro-economic indicators

Document actual Czech achievements in space

Identify potential Czech space suppliers

- Mailing and e-mailing to 133 Czech companies and institutions
- 47 filled questionnaires received
- Selection of 17 companies to be visited

Interview potential Czech space suppliers

- 16 companies visited and interviewed in the Czech Republic

Present the results to a Czech audience

- Final report and validation by ESA
- Final presentation to a Czech Audience

Several Czech companies have been active in space projects

Company	Space projects
Anf Data	**SCOS 2000, Cokmas/Mister, ICC (ESA), Teseus (Eutelsat)**
BBT	**Prodex (ESA), CSK (DLR), Titus (Mir99), Magion 5, Cluster II**
CSRC	**Prodex (ESA), Integral, Smart, Cluster, Demeter, etc**
Gisat	**Prodex (Esa), Corine (EU), Mars 95 (JRC Ispra), Radarsat (CZ)**
Pramacom	**Inmarsat (Xantic)**
Reflex	**US/CZ projects, LE Angel Optics**
Iguassu Software Systems	**SCOS 2000 (ESOC), Envisat (ESA), Meteosat (Eumetsat), telescopte tracking (CZ Sciences Academy), Hispasat, Slick (SSSL)**
Space Devices	**Macek-SH04, XHRS, Mimosa (Astron. Inst.), Fireball (Ondrejov, UK)**
Tescan	**Fixed station interface, OBP**
Testcom	**Intelsat, Eutelsat, Inmarsat, Intersputnik, Viasat, Comsat**

Czech academic organisations and institutions have been involved in scientific space projects

Institution	Space projects
Center of Stress Research (CSR)	Prodex, Ecopsy
Czech Academy of Sciences, Institute of Atmospheric Physics	Magion 4&5, Prodex, Cluster II
Czech Academy of Sciences, Astronomical Institute	Prodex, Mimosa, XHRS, Magion 4
Charles University, Faculty of Mathematics and Physics, Space Plasma laboratory	Magion 4
Technical University of Brno, Faculty of Electrical Engineering and Computer sciences	Amsat-DL (Phase 3D), Magion

Examples of successful collaborations between Czech companies and Western companies

- **No case of "failures" has been detected during the study**
- **Two "success stories" have been described :**
  - **Demeter Project (CSRC/Institute of Atmospheric Physics/ESA)**
  - **Meteosat test tool package (Iguassu Software Systems / Science Systems UK)**
- **Advantages of working with Czech companies :**
  - **High technical competencies and quality level with present attractive costs**
  - **Good motivation, involvement and flexibility of the Czech teams**
- **Improvements and recommendations :**
  - **Adaptation to Western project management methods, vocabulary and standards**
  - **Better communication, regular project meetings and milestones**
  - **Preferably, fixed firm price contracts**

Out of the 36 questionnaires received from companies, 16 were visited, and 20 could be approached to assess their potential (1/2)

Company	Field
ATG, sro	Non-destructive testing systems
Avia Propeller, sro	Aircraft propeller design
Balony Kubicek, ltd	Hot air ballon design and development
Biopsys	Psycho-social analysis methods
Ceske Drahy, so	Railways R&D information systems
Cross Zlin, ltd	GIS / on line traffic information systems
EPA, as	Mechanical engineering
Frencken Brno, sro	Aircraft mechanical parts production
Joxima, ltd	Network control hardware and software
Kappa 77, sro	Aircraft component development
LOM Praha, sp	Aircraft repair and overhaul

Out of the 36 questionnaires received from companies, 16 were visited, and 20 could be approached to assess their potential (2/2)

Company	Field
LZ, as	Aircraft component production
MGE Data, sro	Software and data processing
NA Design, inc	Design, repair and production of composite parts
Optical Devel. Workshop	Optical systems design, production and services
Princip, as	GIS, GSM, GPRS
SVUM, as	R&D and NDT of plastic, metal and composite parts
Technometra Radotin	Hydraulic mechanical component production and painting
Tescan, ltd	Image processing software, precision mechanics, electronic hardware design and manufacturing
Testcom	Radiowave propagation research, satcom test systems

Several academic institutions could also be approached because of their place in the scientific and industrial Czech space network

Institution	Department / field
Center of Stress Research	Human Factor research
Czech Academy of Sciences	Astronomical Institute (space physics & astrophysics)
Czech Academy of Sciences	Institute of Atmospheric Physics (modelling, simulation)
Czech Technical University	Electrical engineering (control computer design) Electrical enginering /physics (plasma, X-Ray)
Czech Technical University	Electromagnetic fields (antenna, microwaves)
Czech Technical University	Transportation (control & telematics, software, GIS)
Technical University, Brno	Mechanical engineering (structure modelling)
Technical University, Brno	Control, measure, instrumentation (robotics, vision)
Technical University, Brno	Radio-electronics (RF microwaves, signal theory) Telecommunications (satcom, digital image, speech)
Technical University Ostrava	VSB (GIS and information systems)

Nodal visited and interviewed 16 Czech companies

Aeronautical Institute (VZLU)
Ateko
Anf Data, s.r.o.
BBT
CSRC*
Era a.s.
Gisat s.r.o.
LA Composite, s.r.o.
Meopta Prerov
Pramacom Prague
Ramet C.H.M. a.s.
Reflex s.r.o
Iguassu Software Systems
Space Devices
UniControls, a.s.
Unis, s.r.o.

* In Prague

The visits and interviews carried out by Nodal allowed to get a precise description of each company and of its strategy

- Company description
  - Name of the company
  - Financial structure (shareholders)
  - Products and services, activity
  - Applications markets and clients
  - Turnover and trend
  - Staff
  - International activity
- Strategy assessment
  - R&D efforts
  - Strengths and weaknesses
  - Competitive position
  - Ambition and strategy in the space domain
  - Expectations from ESA

Nodal's qualitative judgment

Nodal provided a qualitative assessment of the companies' general strengths & weaknesses under six categories

- **Categories**
  - **Technologies potentially transferable to Space**
  - **Company structure, quality organisation**
  - **Partners network (clients, suppliers, institutions)**
  - **Competitive position**
  - **Financial capacities**
  - **Human resources**
- **For the 6 categories, most companies are ranked at a « high » or « average » level**

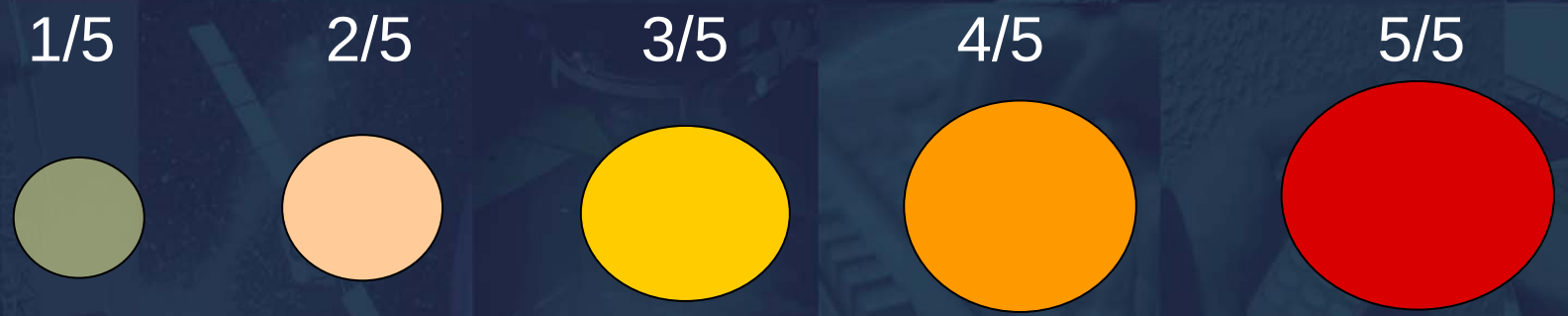
Global assessment of companies general strengths & weaknesses

Best ranking companies (indicative)

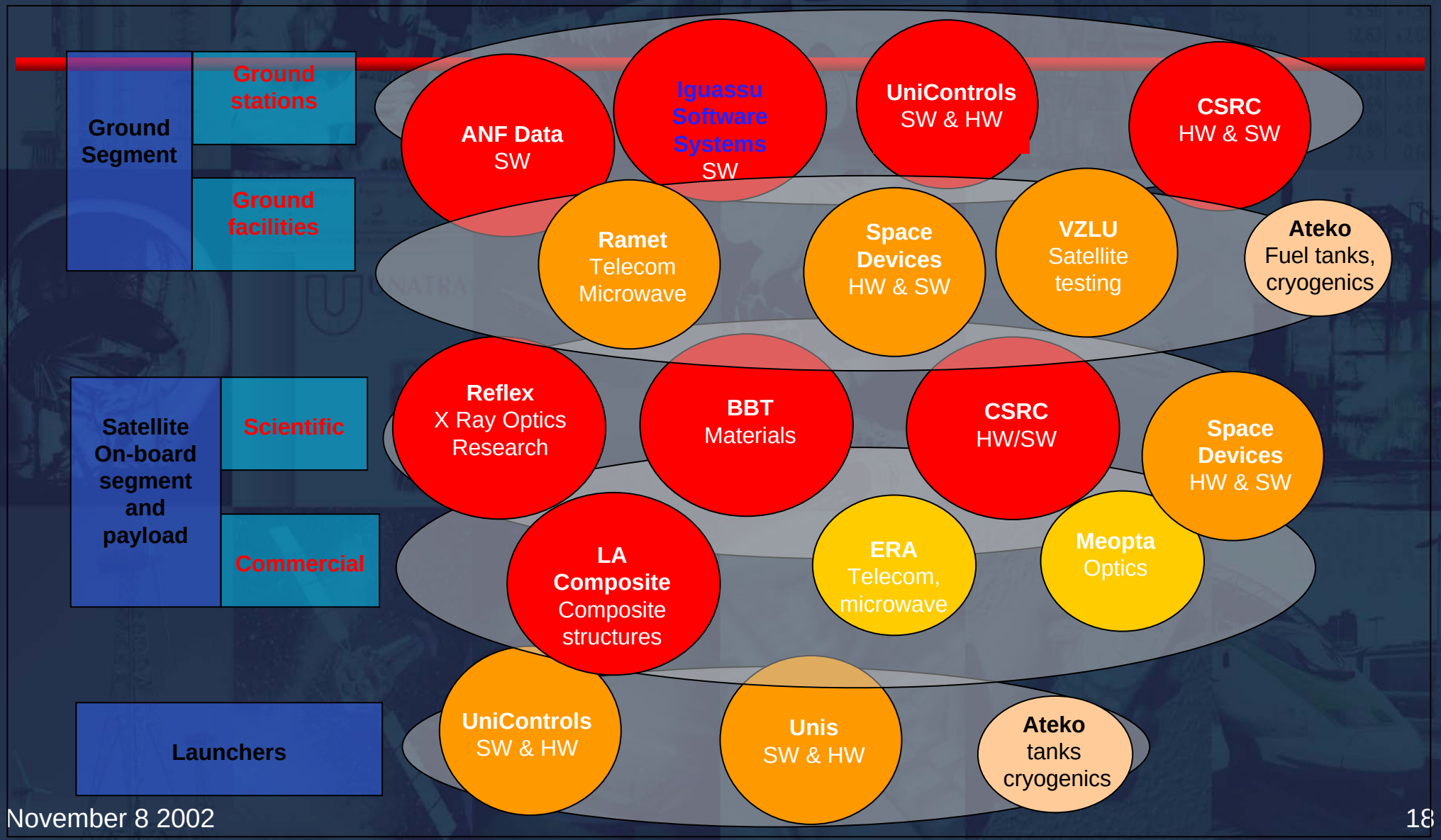
- **Technologies potentially transferable to space :**
  - **Anf Data, BBT, CSRC, Gisat, Reflex, Iguassu Softweare Systems, Space Devices, VZLU**
- **Structure, quality organisation**
  - **Anf Data, Gisat, Reflex, VZLU**
- **Partners network**
  - **BBT, CSRC, Gisat, Meopta, Iguassu Softweare Systems, VZLU**
- **Competitive position**
  - **Anf Data, BBT, CSRC, Gisat, Reflex, Space Devices**
- **Financial capacities**
  - **Anf Data, Reflex, VZLU**
- **Human resources**
  - **Anf Data, BBT, CSRC, Gisat, Reflex, Iguassu Software Systems**

The mapping of the Czech space industry is based on four main specific criteria

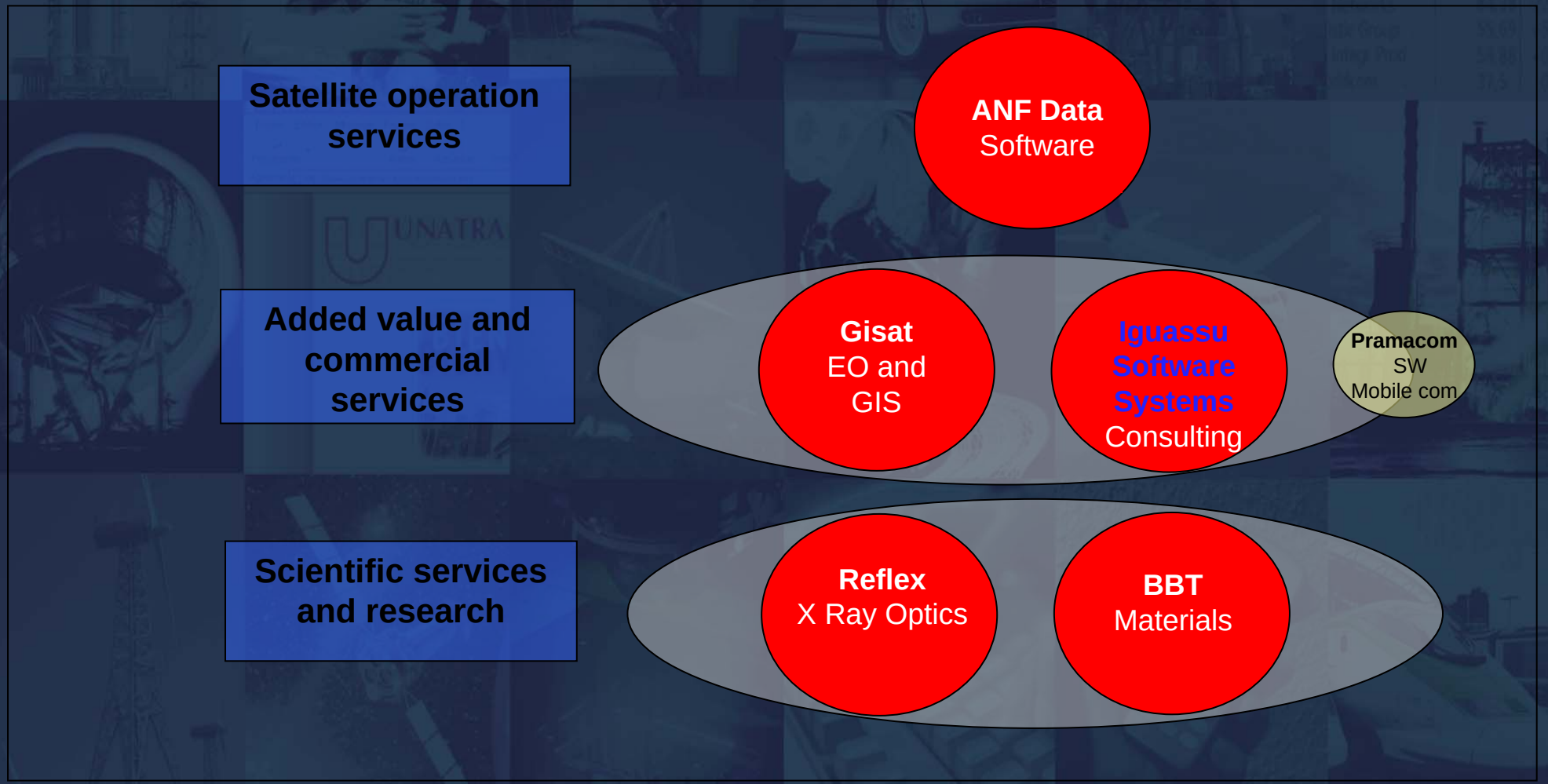
- 4 criteria representative of the potential involvement of the companies in short term space projects have been selected :
  - Space technological and technical level
  - Motivation for space development
  - Space industry experience
  - International experience and partnership
- Based on these criteria each visited companies has been graded from 1 to 5
- Each company has been placed on a graph showing their priority space activity



Most promising companies in space equipment design and manufacturing

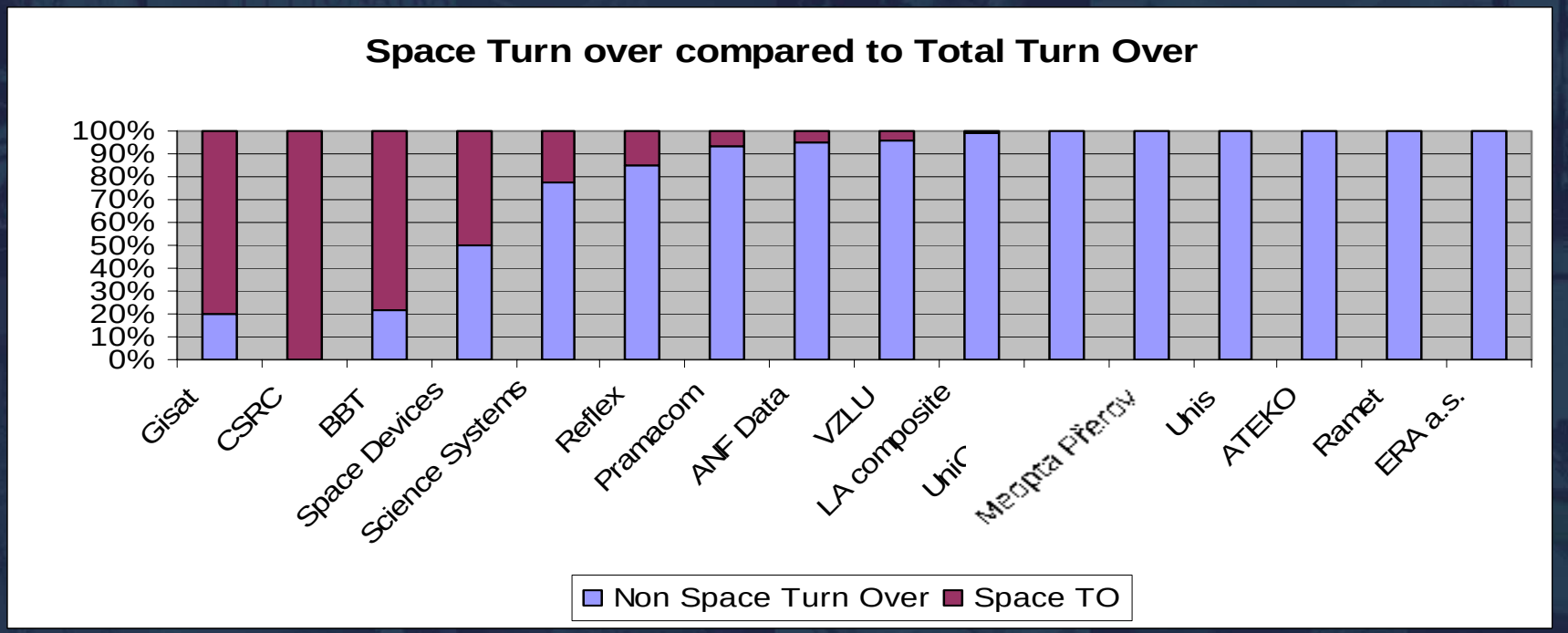


Five Czech companies can play a role in commercial and scientific space services



Half of the visited companies have a significant space activity

- CSRC, Gisat, BBT, Space Devices have the highest space turnover ratio
- CSRC, VZLU, Anf Data, Gisat, BBT have the highest space contribution in volume
- The cumulated total space turnover of these companies is 1.8 M € annually



The financial structure has an impact on the financial resources methods, and reactivity of the company

Capital structure	Shareholders	Examples	Consequences
Czech majority	-Several Czech individuals -One Czech individual -Czech indiv and Czech state -Czech individuals plus foreign company -Czech State plus foreign banks	- Space Devices, Ateko, LA composites, Unicontrols, CSRC, Unis -Gisat, BBT, Pramacom -Ramet (Omnipol) -ERA (Thales, plus Omnipol) Iguassu Software Systems -VZLU (Banks)	Lack of cash flow and investment resources Strong reactivity Strong national network Easier access to national market
Foreign majority	- Foreign company - Foreign company plus Czech individuals - Foreign individuals	-Reflex (Bedde) -Anf Data (Siemens) -Meopta	Financial resources Western methods and standard Easier international partnership?

The visited companies have a good personnel educational level

Educational level

High	2 Companies Total Staff : 57	2 Companies Total Staff : 301	4 Companies Total Staff : 48
	3 Companies Total Staff : 585	2 Companies Total Staff : 254	2 Companies Total Staff : 490
Low	0 Companies	0 Companies	0 Companies
	Low	***English language level***	**High**

The assessment showed a potential for the development of space activities in the Czech Republic

- Skills, know-how, industrial network and infrastructure are present :
  - high academic and technical competences
  - high quality standards (8 companies ISO 9001 out of 16 visited)
  - basic space domain experience in several key domains:
    - Software and hardware design and manufacture for the ground segment
    - On-board software and hardware, structures, optics design and manufacture
    - Research projects on materials and optics
    - Value-added services
- A high competitiveness level, due to a high quality / cost ratio
- This favorable situation makes possible future ESA contracts for the Czech companies in the short term

Four types of projects could be proposed to Czech industrial partners in the short term

- **Software and hardware projects for the ground segment :**
  - Iguassu Software Systems, Anf Data (software)
  - UniControls, Unis, CSRC (hardware and software)
  - VZLU (satellite testing)
- **On-board hardware, software, structure projects** :
  - CSRC, Space Devices (on-board hardware and software)
  - LA Composites (structures)
- **Scientific projects and research:**
  - BBT (materials)
  - Reflex, Space Devices (optics and astronomy)
- **Added-value services** :
  - Anf Data (software for satellite operation)
  - Gisat (GIS)
  - Iguassu Software Systems (consulting)

Four key success factors for the development of the Czech space industry

- The key success factors for the development of the space industry in the Czech Republic are linked to the improvement of the weaknesses detected :
  - « Market » culture
  - Training and human resources
  - Communication and increased information on space projects
  - Financial resources

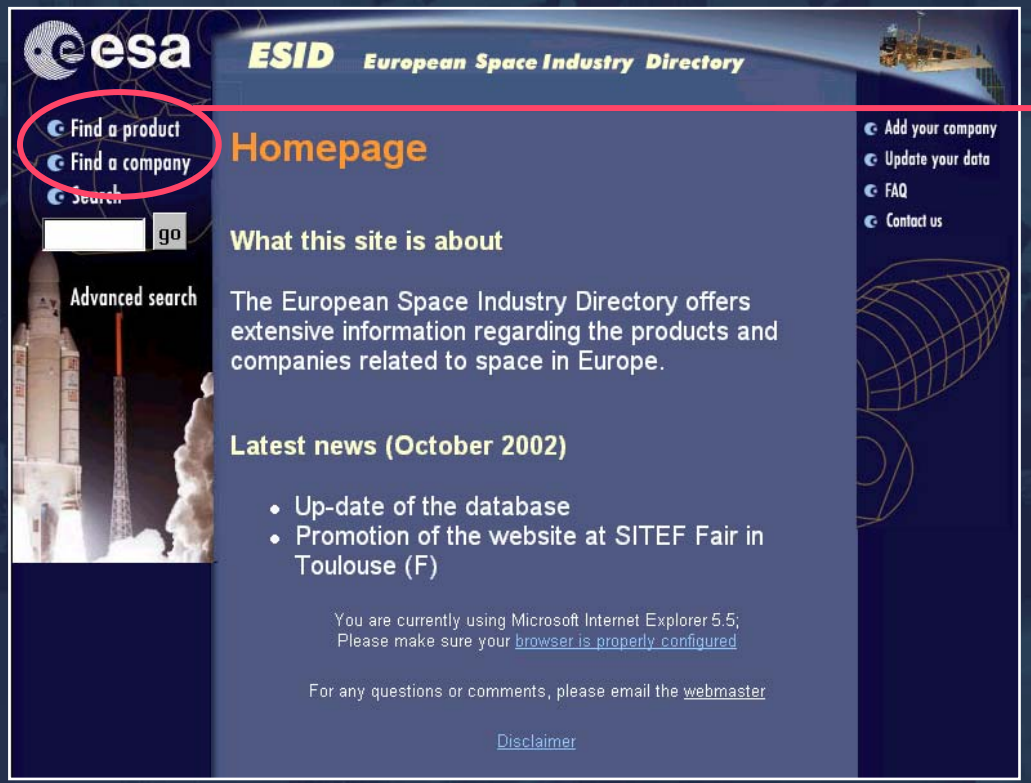
Communication actions toward Czech and Western companies

- **Communication actions towards Czech companies :**
  - Inform Czech companies with no idea on space projects they could be involved in
  - Use and promote European Space Industry Directory, ESID website
  - Prepare a list of Esa projects ordered by domains and competences needed
  - Organize an exchange forums in the Czech Republic with Western companies
- **Communication actions towards Western companies :**
  - Inform on opportunities and potential partners in the Czech Republic
  - Provide practical advices (cultural, professional, administrative)

Czech companies and organisations can use the ESID website for their search for space projects partners

- European Space Industry Directory is a ESA website available at : www.esidirectory.org
- ESID offers a detailed description of:
  - 400 Esa member state companies with space activities
  - 1 100 Products and services developed for space programmes
  - Contact persons for each company and/or product
- Products and services are ordered according to the ESA classification

The ESID website is easily accessible (www.esidirectory.org)



Proposed training actions

- ESA could provide Czech companies with training adapted from its existing SME programme
- Training sessions should be made available to Czech space company managers, in collaboration with the Ministry of Education, in particular in :
  - Language (English)
  - Marketing and commercial methods
  - Technical and management, for example:
    - ESA standards and vocabulary
    - Quality
    - Project management
    - ESA invitations to tender

Further studies

- In collaboration with the Czech Space Office, detect :
  - New potential space domains
  - New space market players
- Corresponding actions would be :
  - Contact subcontractors or suppliers of companies already visited
  - Visit and interview institutions and companies which answered the questionnaire
  - Follow-up on organisations which did not reply

The sucessful development of the Space industry will be the result of the actions of three players

- The Czech Government
- ESA
- And above all, the companies themselves

Thank you for your attention