



# bavAIRia

Europe's heart of aerospace  
and navigation

# The Bavarian Aerospace & Satellite Navigation Clusters

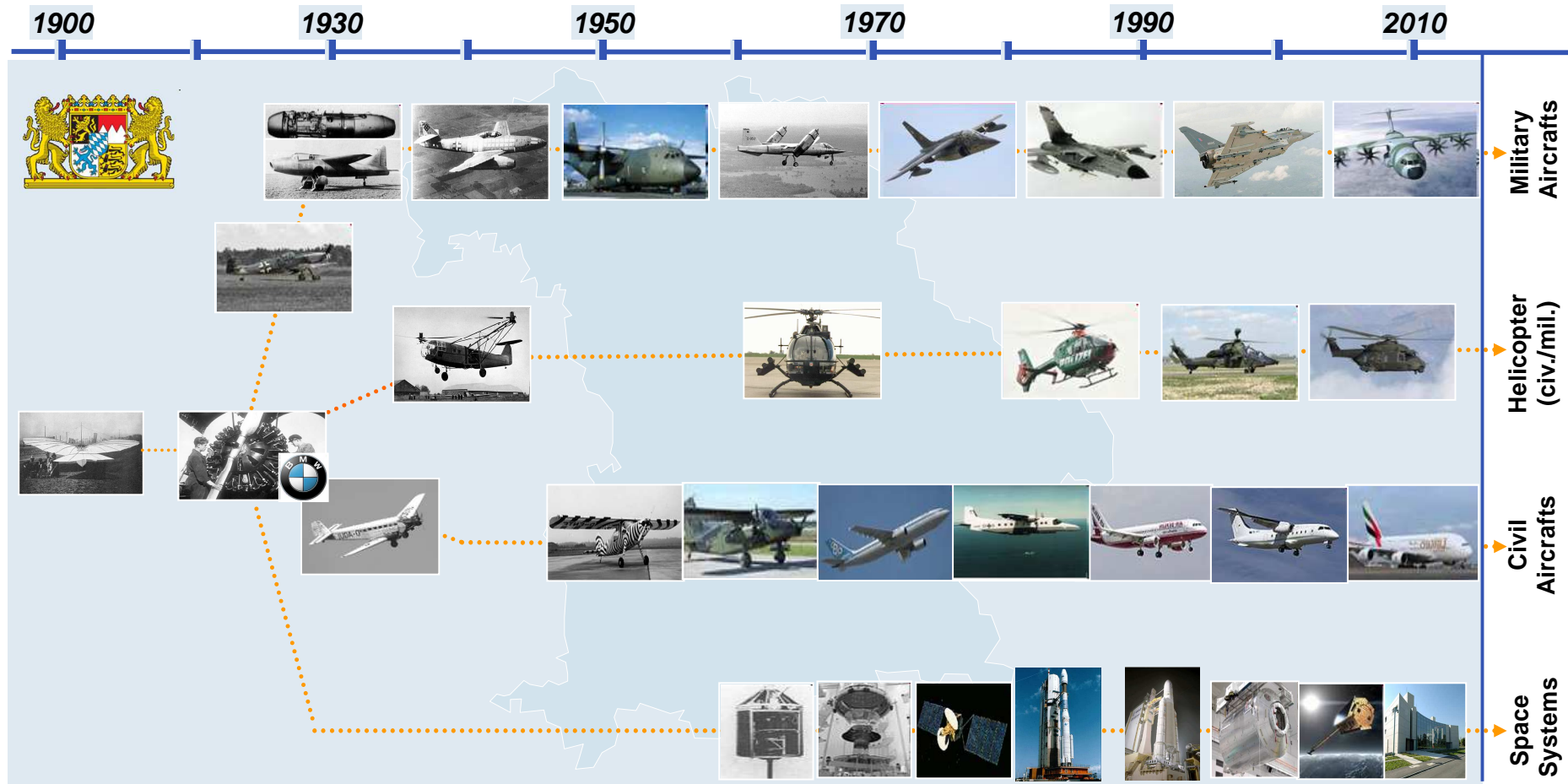
NEREUS GNSS WORKING GROUP

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Brussels, March 2010

# Aerospace has a long tradition in Bavaria. Since 1901 „Made in Bavaria“ stands for High Tech, Innovation, Quality and Reliability



## Bavaria is a genuine Aerospace and SatNav Cluster – almost complete Aerospace and SatNav value chains are located here

### THE BAVARIAN CLUSTER

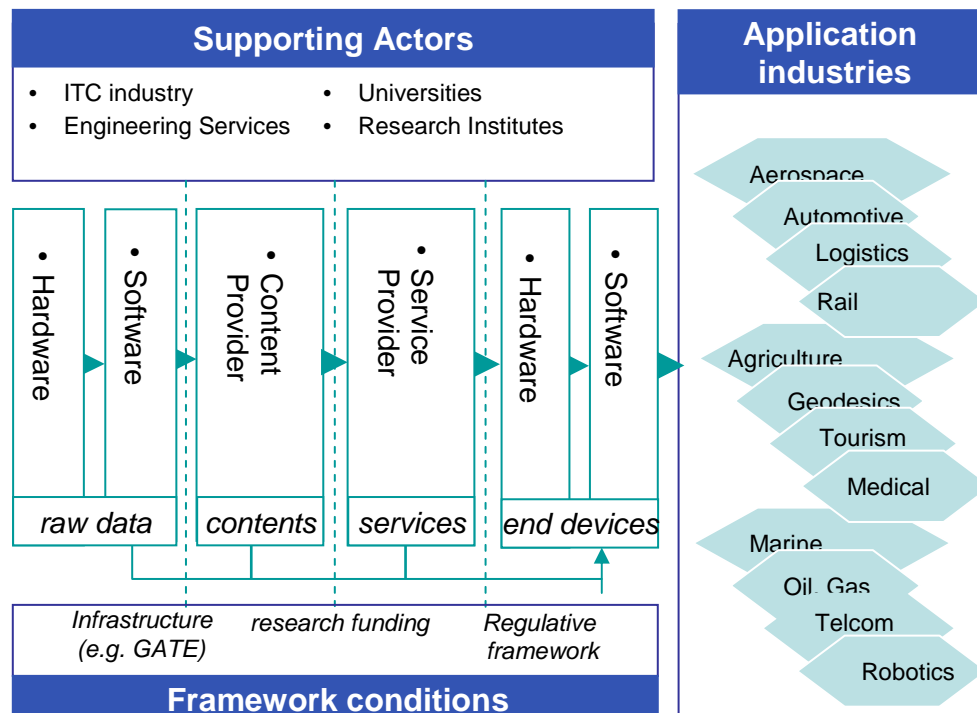


### REMARKS

- In total, **over 55,000** people work in the Bavarian Aerospace industry, generating revenues of approx. **6.9 Bn Euros**. The focus of aerospace activities is the Munich metropolitan region
- **Prime contractors** are EADS (Astrium, Defence, Eurocopter), MTU Aero Engines, **important first tier equipment suppliers** are e.g. Diehl, Liebherr, important parts suppliers are e.g. Leistritz, Aerotech Peissenberg and FAG Aerospace
- **8 universities and 6 research institutes** (DLR, Fraunhofer- and Max-Planck institutes) do research in Bavaria in the field of aerospace and satellite navigation
- **World class infrastructure** (e.g. GCC, GSOC, GATE, ESA BIC, ZKI, airports, etc.)
- Products and aerospace systems of world renown: Eurofighter, Eurojet, Eurocopter Tiger, Eurocopter NH 90, Airbus, A 400M, Tornado, Alpha Jet, Dornier 228 and Dornier 328, Ariane V, TerraSAR-X, Satcom BW, Galileo

## A genuine Satellite Navigation cluster – the entire value chain from raw data up to application industries is located in Bavaria

### THE BAVARIAN CLUSTER



### REMARKS

- More than **150 SatNav companies** with over **1,500 employees** generate **more than 350 Mio. EUR revenues** in SatNav applications
- prominent players are e.g. EADS Astrium, ESG, Garmin, IABG, NavTech, Siemens, T-Systems
- **8 universities and 6 research institutes** (DLR, Fraunhofer and Max-Planck institutes) do research in Bavaria in the field of aerospace and satellite navigation
- **World class infrastructure** (e.g. GSOC, GATE, Galileo Control Center, AZO, ESA BIC, etc.)
- Munich Satellite Navigation Summit, Systems, Transport & Logistic, GNSS Symposia, e.g. Advanced Driver Assistance Systems 2008, Legal and Regulatory Aspects of GNSS 2009
- „Geotelematics & Navigation Bachelor“ and „Geoinformatics and Satellite Positioning“ studies at University of Munich

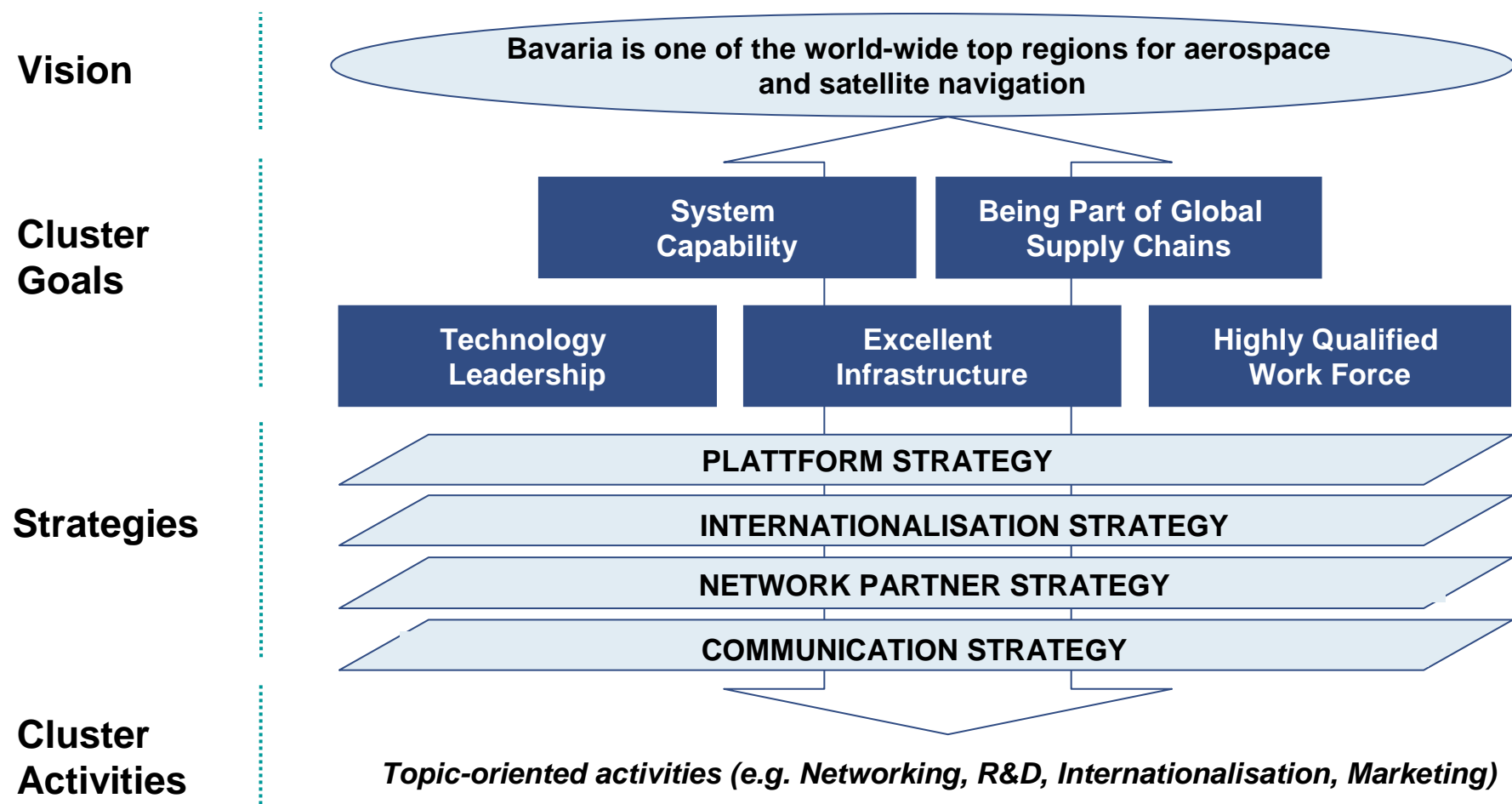
## bavAIRia e.V. represents the aerospace as well as the satellite navigation in Bavaria

- bavAIRia is commissioned by the **Bavarian State Government** with the management of the **aerospace cluster as well as the satellite navigation cluster** and therefore has undertaken the tasks from the Bavarian 7-point-work program.
- bavAIRia is an **association** of entrepreneurs, universities and research facilities from the aerospace, satellite navigation sector in Bavaria that currently comprises **> 150 members**.
- Dr.-Ing. Martin Haunschild, executive board of bavAIRia e.V., is **presenter of aviation, aerospace, satellite navigation**, a mandate of the Bavarian State government of economics, infrastructure, transport and technology (Bay. StMWIVT)

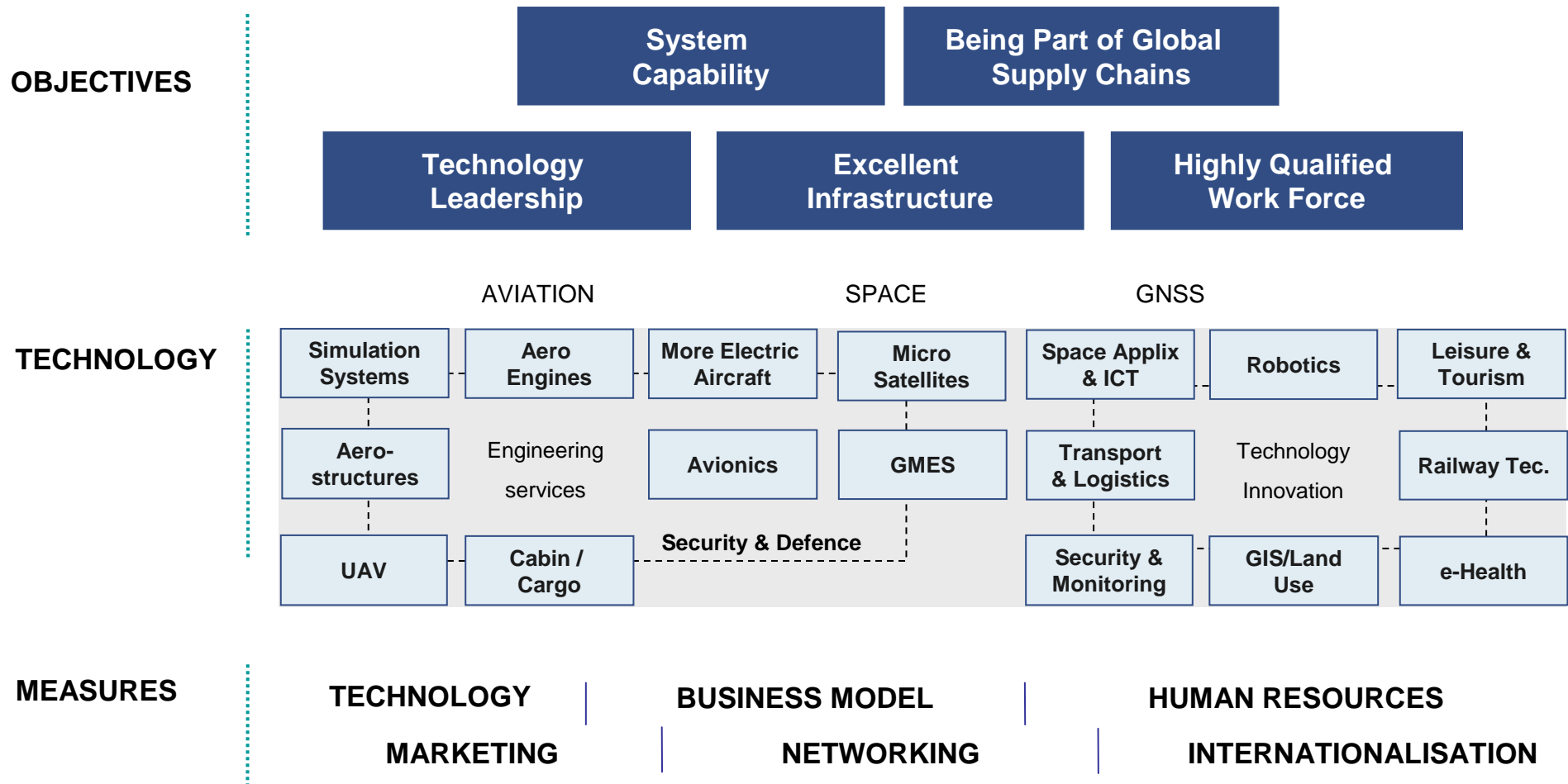
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**bavAIRia is a neutral mediator:** in close collaboration with industry, research and politics, actions and projects are developed and supported for the strengthening of the aviation, aerospace and satellite navigation. For technology projects the stated aim is to transform inventions in the market area into successful innovations.

bavAIRia aims at further strengthening the cluster to develop Bavaria into one of the worlds aerospace top regions



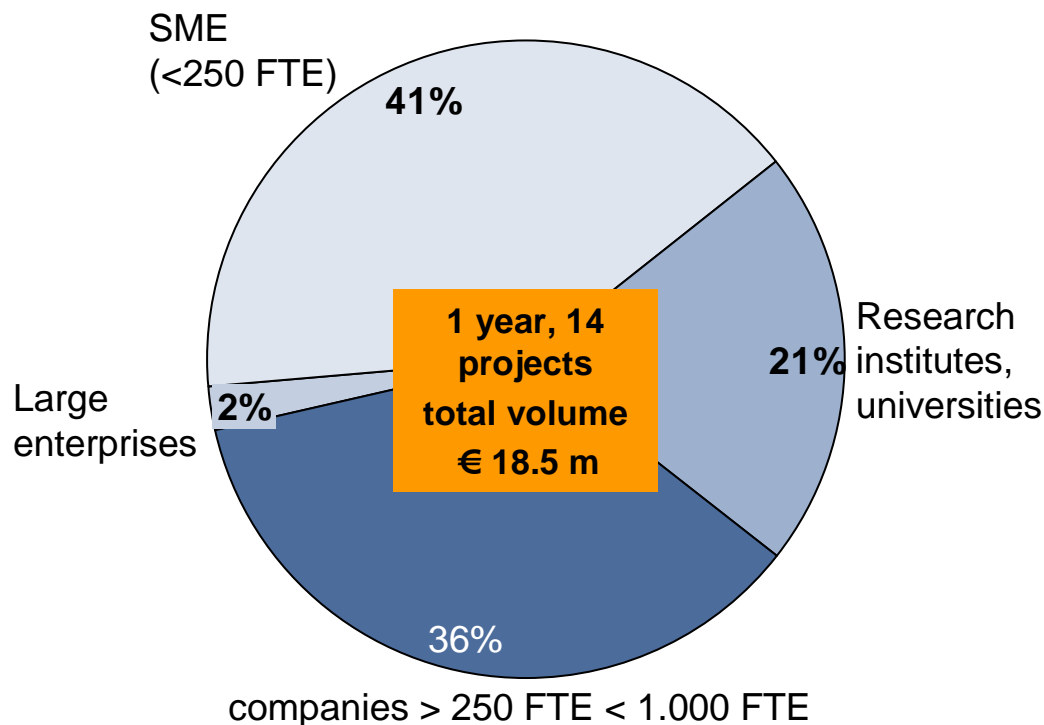
bavAIRia aims at securing the cluster companies an important role in global supply chains





## Innovation requires technology development: bavAIRia initiates a substantial volume of SME R&D projects

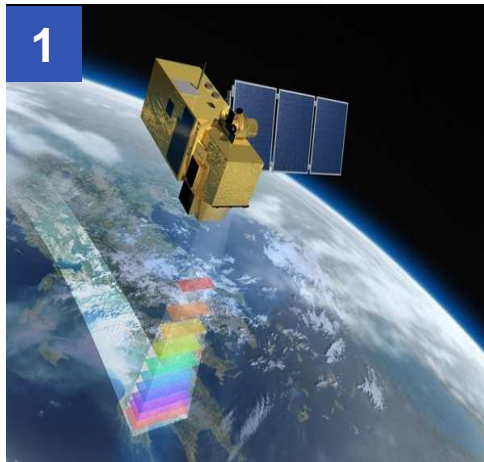
### DISTRIBUTION OF PROJECT VOLUME SME PROJECTS (Period Jul 08 – Jul 09)



- Between July '08 and July '09 14 aerospace & satnav R&D projects were initiated
- 42 companies, 19 universities and research institutes involved
- Total project volume: € 18.5 m [€ 9.8 m funded by government]
- Projects within technology fields: "aero engines", "more electric aircraft", "avionics", "aerostructures", "security [satnav]", "logistics" [satnav]

## Aerospace applications also focused by project work

### Survey of classical aerospace applications



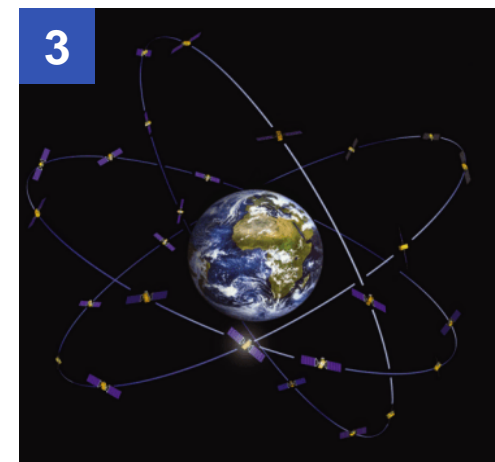
**Earth observation (EO)**

Registration, allocation, preparation and utilization of geo-data via satellite-based and air-launched systems.



**Satellite communication**

Bidirectional exchange and transmission of informations via satellite-based communication systems



**Satellite navigation**

Determination of position and navigation via satellite signal and complementary pseudolite systems

Bavarian user forums bring together the actors from different stages of the value chain, resulting in creative ideas & projects

BAVARIAN SATNAV SECTORS & USER FORUMS



3 Space Applix/ ICT



4 Security



5 Robotics



6 Transport



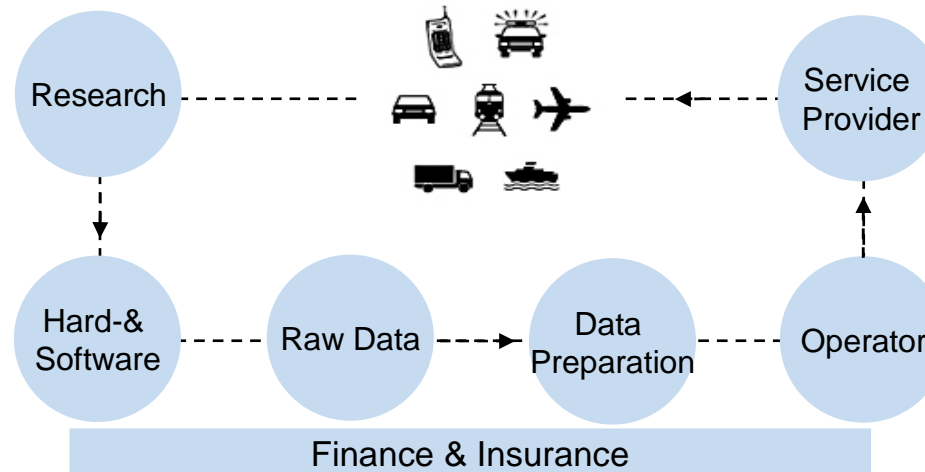
7 Railway Tec.



2 Tourism & Leisure



1 e-Health/ Telemedicine



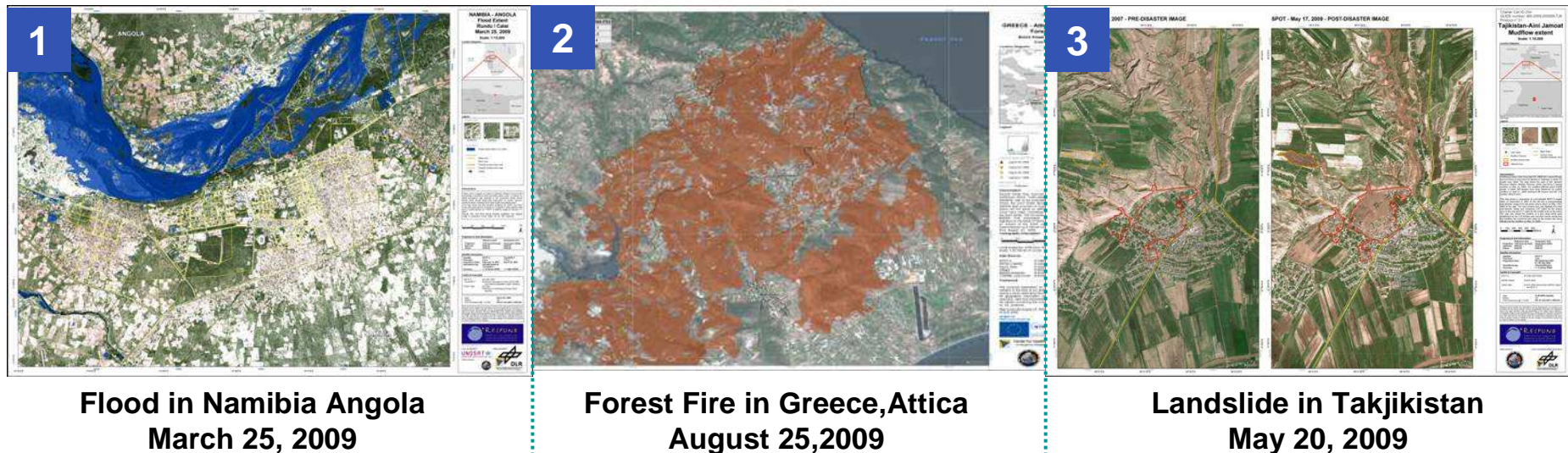
8 GIS/ Land Use



9 Regional forums Nürnberg & BGL

# Global Monitoring For Environment and Security - bavAIRia's GMES Office concentrates EO Competence in Bavaria

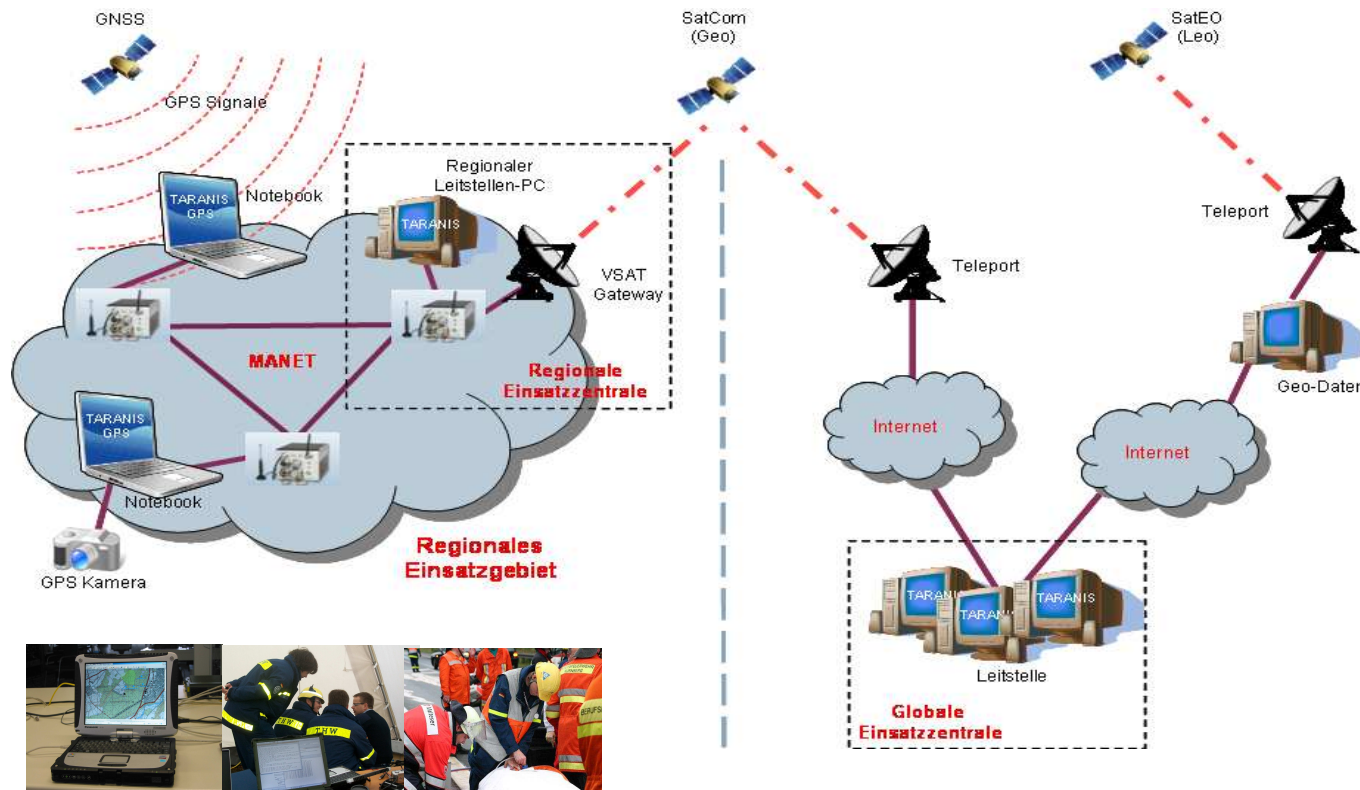
## Geoinfo products for crisis management



The GMES Office has identified relevant Bavarian expertise and has established networks of industry, research and public authorities which assure the effective use of GMES for environmental and security applications.

# bavAIRia and the State of Bavaria support innovative networks to realise their innovative (integrated) ideas in concrete projects

Example: BAYSAT KRISIS – Bavarian Satellite Based Crisis Information System

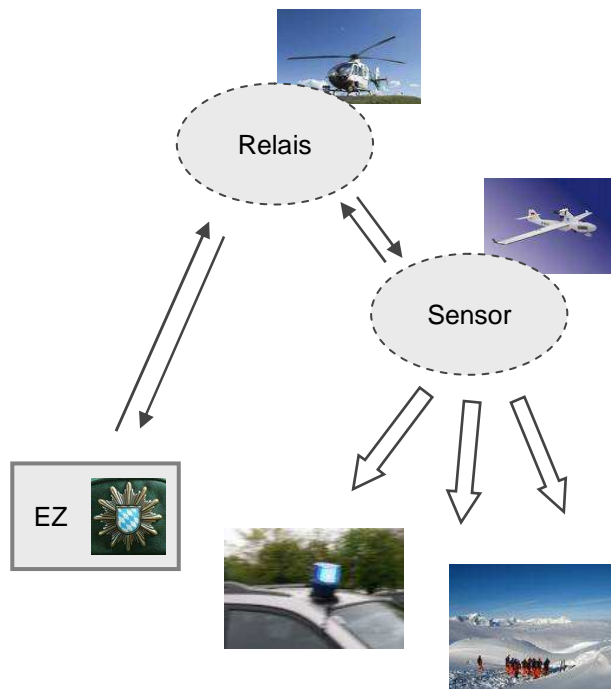


# Fostering the civil (dual) use of UAV and development of relevant technologies, e.g. sensors, mission control and autonomy

## UNMANNED AERIAL VEHICLES



Simplified schematic example without integration of satellite communication (satellite data relays)

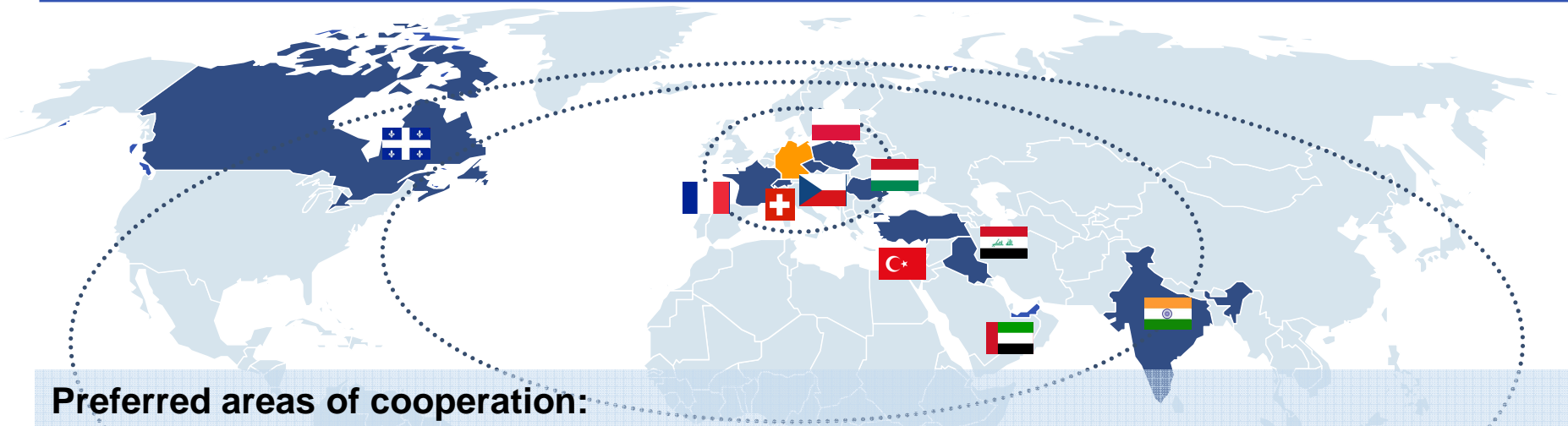


## Remarks

- The bavAIRia innovation platform “CIVIL UAV” is a **co-operational aerospace cluster project**, it integrates system companies, sme’s, universities, research institutes and users – DEMUEB is funded by Bavarian Ministry of Economics, Infrastructure, Transport & Technology
- The **objective** is to optimize technology (e.g. sensor technology like EO, IR, multi-spectral) for civil use and to integrate new technology and competencies into civil organizations and civil procedures (e.g. Bavarian and Federal Police Forces, Alpine Rescue Organizations)
- Successful **flight demonstration** on 30th June 2009 in Manching and initiation of project’s part III
- New partners have joined the consortium in late 2009, e.g. German Aerospace Center (DLR) - Institute for Robotics and Mechatronics - and German Air Traffic Control for questions of UAV air traffic insertion
- **Communication** of the State of Bavaria as Center for Excellence for Civil UAV Technology

bavAIRia cooperates with other aerospace and satellite navigation clusters and supports companies in the field of internationalisation

## INTERNATIONALISATION



### Preferred areas of cooperation:

- R&D projects (e.g. partly public funding)
- Engineering services (e.g. subcontractor networks, transnational work packages , etc.)
- Human Resources (training programmes, internship exchange programmes)

# With participation in EU projects, bavAIRia aims at fostering European networks and at increased regional cooperation

## EU-PROJECTS



**KIS4SAT** – supports innovation to develop knowledge-intensive SatNav services, networking of 25 regional clusters in Europe, voucher project



**INNOFIT** – project of the 7th framework programme, aims at improving the network between industry and science



**SIDEREUS** – aims at closer cooperation between Europe and Asia, focus on GALILEO, COMPASS and IRNSS applications



**INFOMOBILITY Center** – establishing a certification and standardisation organisation

**ENCADRE ASSOCIATION** – network of european clusters – establishing direct access to EC DG ENTR, EC DG TREN, GSA, ESA – 3 international working com, 2 Encadre offices (Munich and Nice)



**NEREUS** – Network of European Regions Using Space Technologies

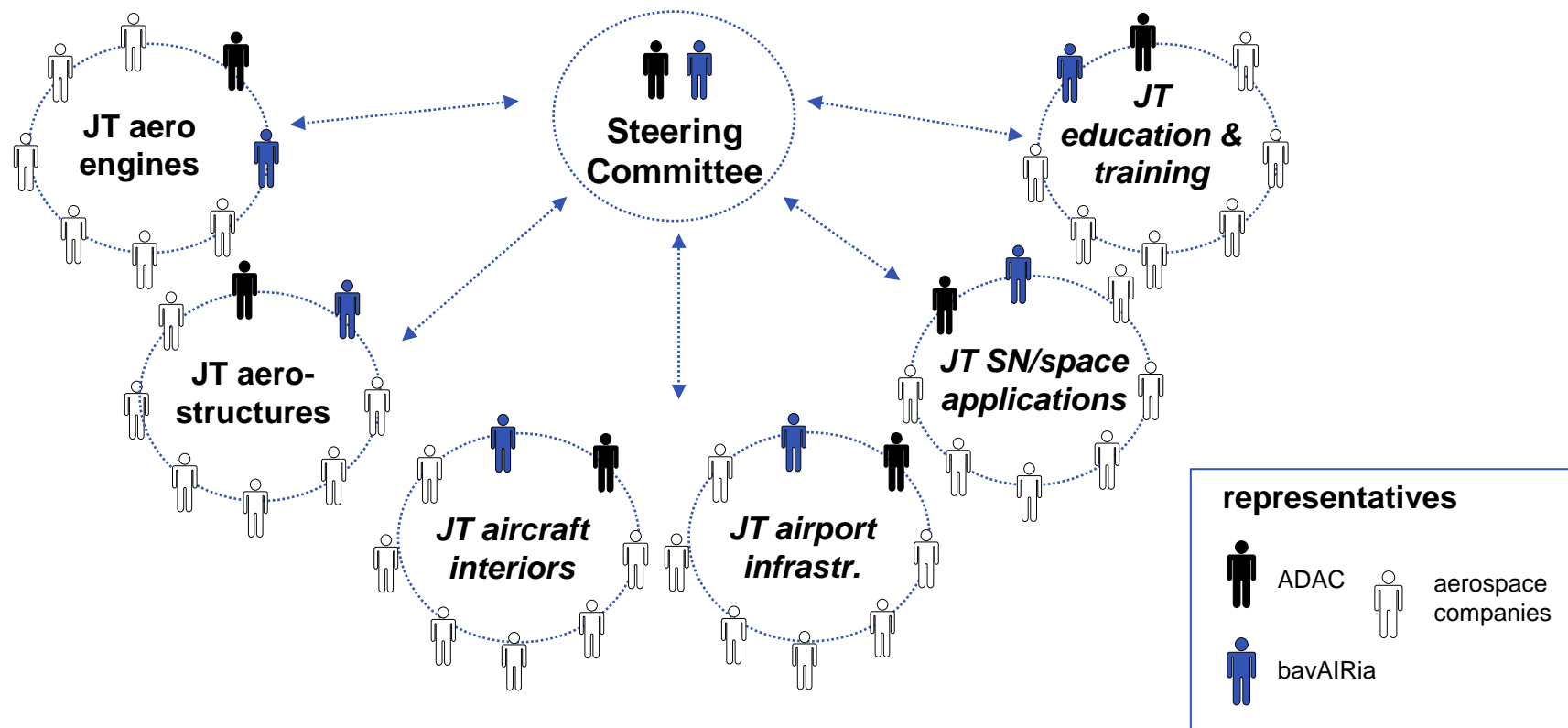
## REMARKS

- Standardisation is key to successfully industrialise SatNav applications. To realise standardisation, partners from industry, science and politics have to be won, international cooperations established, e.g. via partnerships in cluster activities of the European Union, e.g. Europe Innova, ENCADRE, CASTLE, Infomobility Center
- With participaton in EU projects, bavAIRia aims at:
  - Fostering networks to the EC, ESA, GSA with Bavarian SMEs, as well as aligning EU activities with the needs of industry and science
  - Fostering technology transfer between regions, strategy development and activities to stimulate demand for SatNav applications in a variety of application industries
  - Ensuring Bavarian impact on European cluster development strategy papers and measures, e.g. DG Research Joint Action Plan on Demand Creation in the field of GNSS (Innofit), GNSS Regional Advisory Board, GMES Munich Office



# Together with partners in Abu Dhabi bavAIRia has initiated 'Joint Team Work' to discuss business opportunities

The „Twin Cluster Agreement“.



# Satellite Navigation is still a young industry - the Galileo Roadshow aims at creating awareness for SatNav in a broader public

## GALILEO ROADSHOW

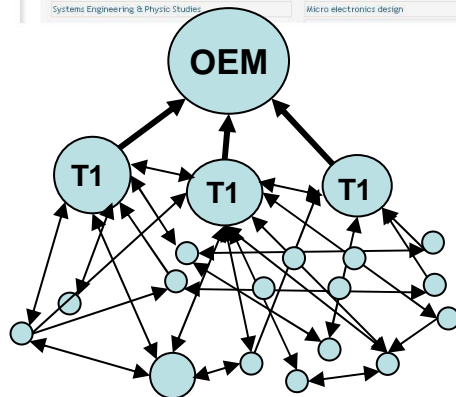


## REMARKS

- Galileo, the future European Satellite Navigation Systems is after Airbus the second largest EU technology project so far
- SatNav applications are a market worth billions, and offer a job potential of up to 10,000 in Bavaria (see McKinsey-Study in 2003)
- The Galileo roadshow was initiated in 2005 to create awareness for Galileo in a broader public, but also to motivate SMEs to develop applications for Galileo and to use SatNav applications
- The roadshow was initiated by Dr. Haunschild, today cluster speaker Satellite Navigation
- In 2008 the roadshow will be extended into regions outside bavAIRia, nationally and internationally
- 2010: University of Munich integrating the faculty for tourism, Berlin, Konstanz, Berchtesgaden, Vienna

# ACCESS aeronautics is an information, procurement and sales tool specifically for aerospace engineering services

## ENGINEERING SERVICES PORTAL



## REMARKS

- engineering services suppliers present their competencies to customers in a very detailed yet simply accessible way
- International scope:
  - English language only
  - Engineering services providers and OEMs worldwide can participate
- USP and main difference to existing portals:
  - Focus exclusively on aerospace engineering services
  - Search via E2S-activities and ATA-chapters (e.g. Fatigue Analysis – ATA 53 Fuselage) and additional company information (e.g. certifications, standards, tools)
  - ACCESS depicts the process steps „searching for a specialist supplier for a certain task“, „comparing specialists“ and „send an RFI email to a selected list of recipients“
- Neutral platform: Initiated and operated by aerospace cluster organisation(s)/associations

## bavAIRia Showroom at Munich airport - SME companies present themselves to a large public audience

### SHOWROOM

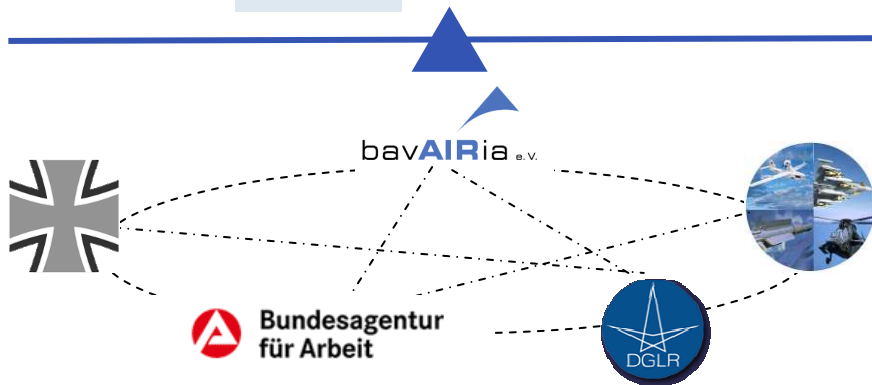
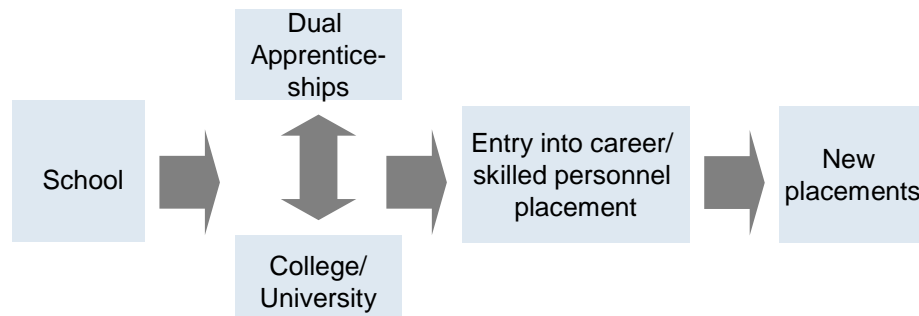


### REMARKS

- The area has a size of about 115 m<sup>2</sup> and is located at Pier North between the shopping zone and the gates
- The exhibition is planned to last a minimum of 1 year
- The entire showroom or parts of it can be leased for a minimum of one month

The basis for innovation are humans – bavAIRia and its partners offer an integrated package of human resources activities

## EDUCATION PROCESS



*Partners are aerospace companies, universities, associations, ministries/agencies, and the Armed Forces*

## REMARKS

- School partnerships & school road shows with companies
- Initiating partner of skyfuture programme **SKYFUTURE.de**
- Initiatives for further education for college dropouts and ex-soldiers
- Initiation of a Master programme in Satellite Navigation
- Initiation of endowed chairs at technical universities **jobcluster**
- Job fairs / graduate fairs
- Job cluster portal

## Next to bavAIRia, the activities of a number of additional organisations support satellite navigation cluster development

### ORGANISATIONS, ACTIVITIES



- 8 active user forums
- EU-Projects
- Symposia
- Galileo Roadshow



- Galileo Masters Competition
- Incubator for Start-ups (ESA BIC)
- EU-Projects

Bavarian SatNav activities of additional organisations

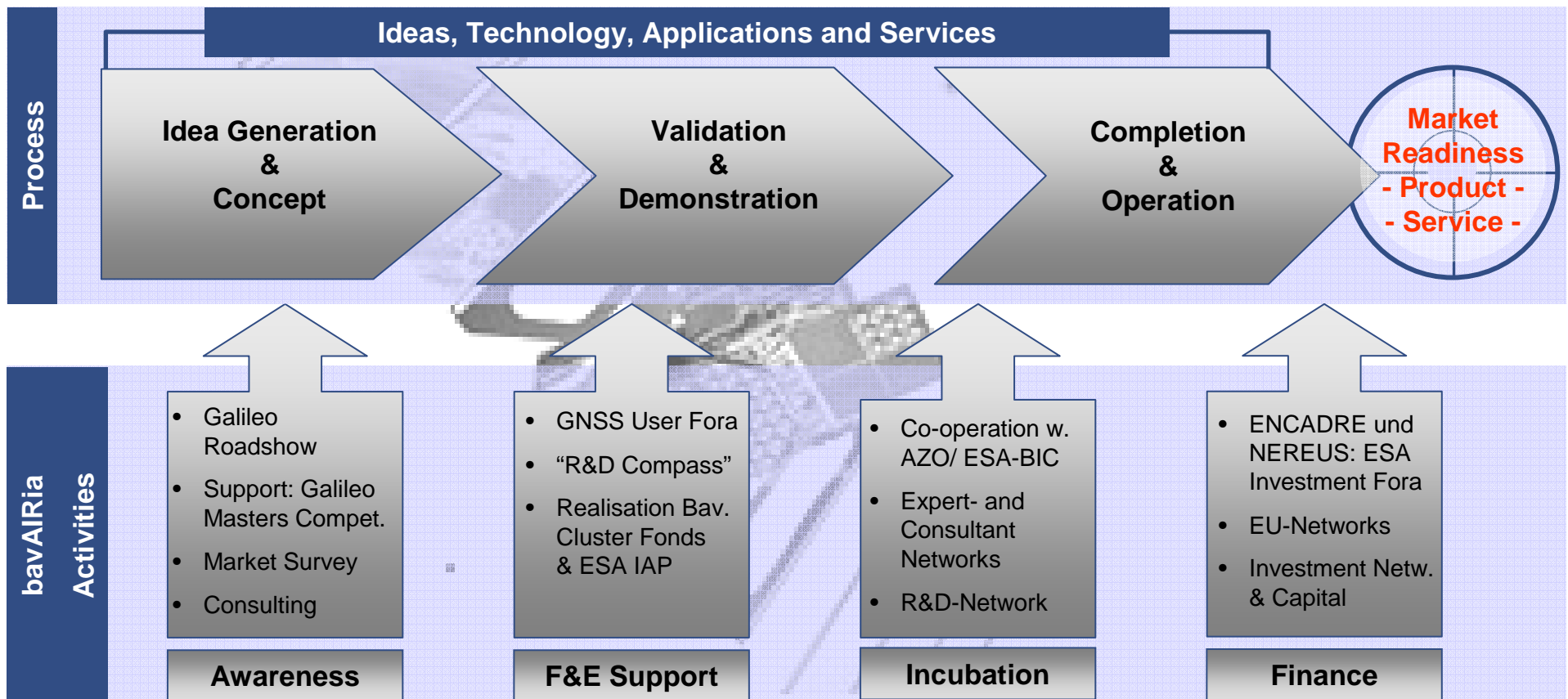


### REMARKS

- Next to the activities of the focal organisations bavAIRia and AZO the activities of additional organisations play an important role in cluster development:
  - the Munich Satellite Navigation Summit, organised by the University of Federal Armed Forces Munich (UniBW), is the most important conference for SatNav applications worldwide, next to the ION in Texas
  - Munich SatNav Summer School, initiated by UniBW Munich is the only international SatNav summer school worldwide
  - A number of international trade fairs in Munich have set up SatNav areas: Transport & Logistik, Systems GNSS Area
  - IHK Nürnberg (trade chamber) with SatNav user club
  - Initiative SatNav Berchtesgadener Land (close to GATE Testbed)

# Companion of entrepreneurs with innovative ideas via R&D towards market ready GNSS products and services

## TECHNOLOGY INNOVATION PROCESS GNSS



## Contact

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