The Integral Satcom Initiative

SME Conference

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Rose vision

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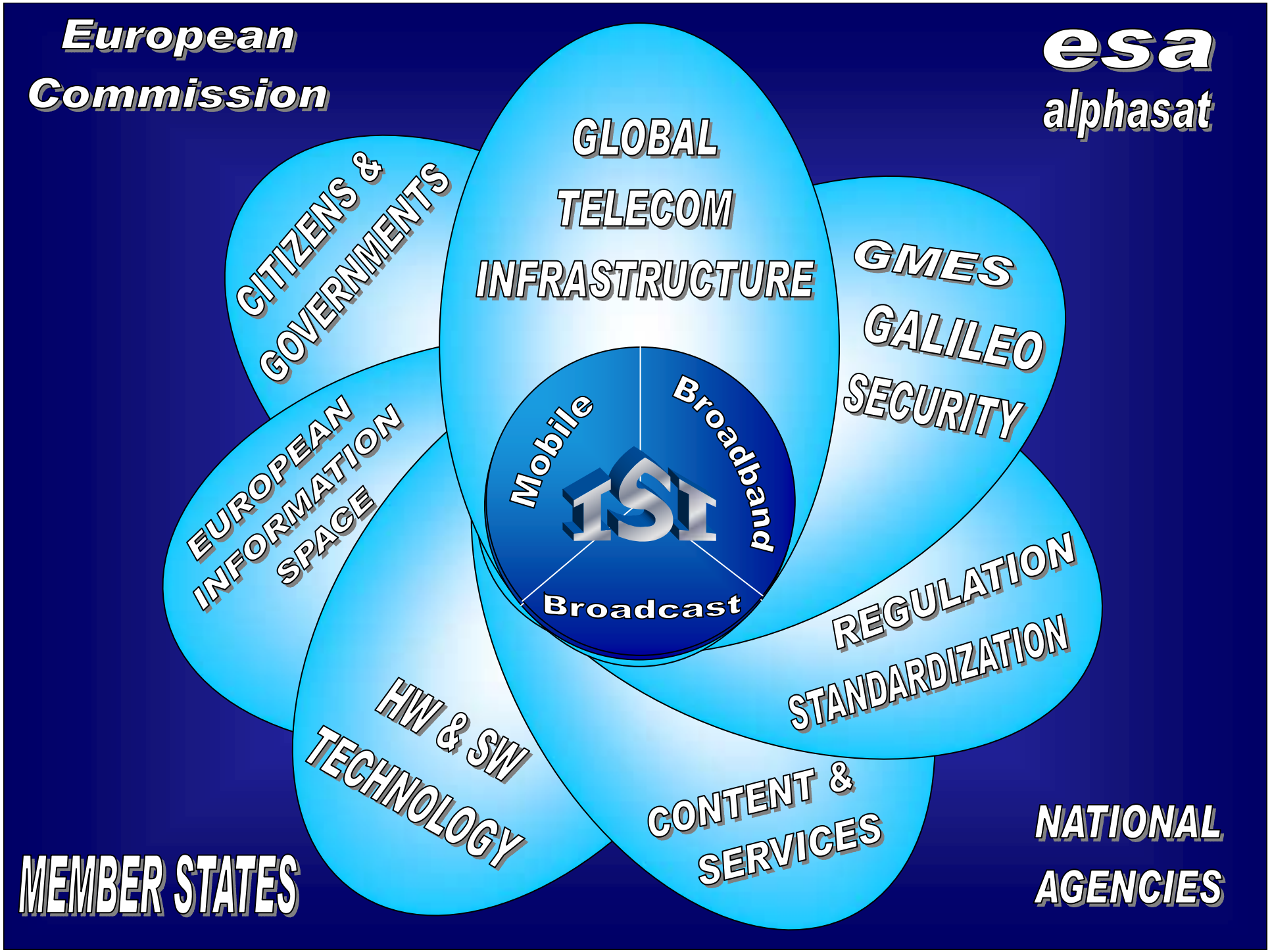
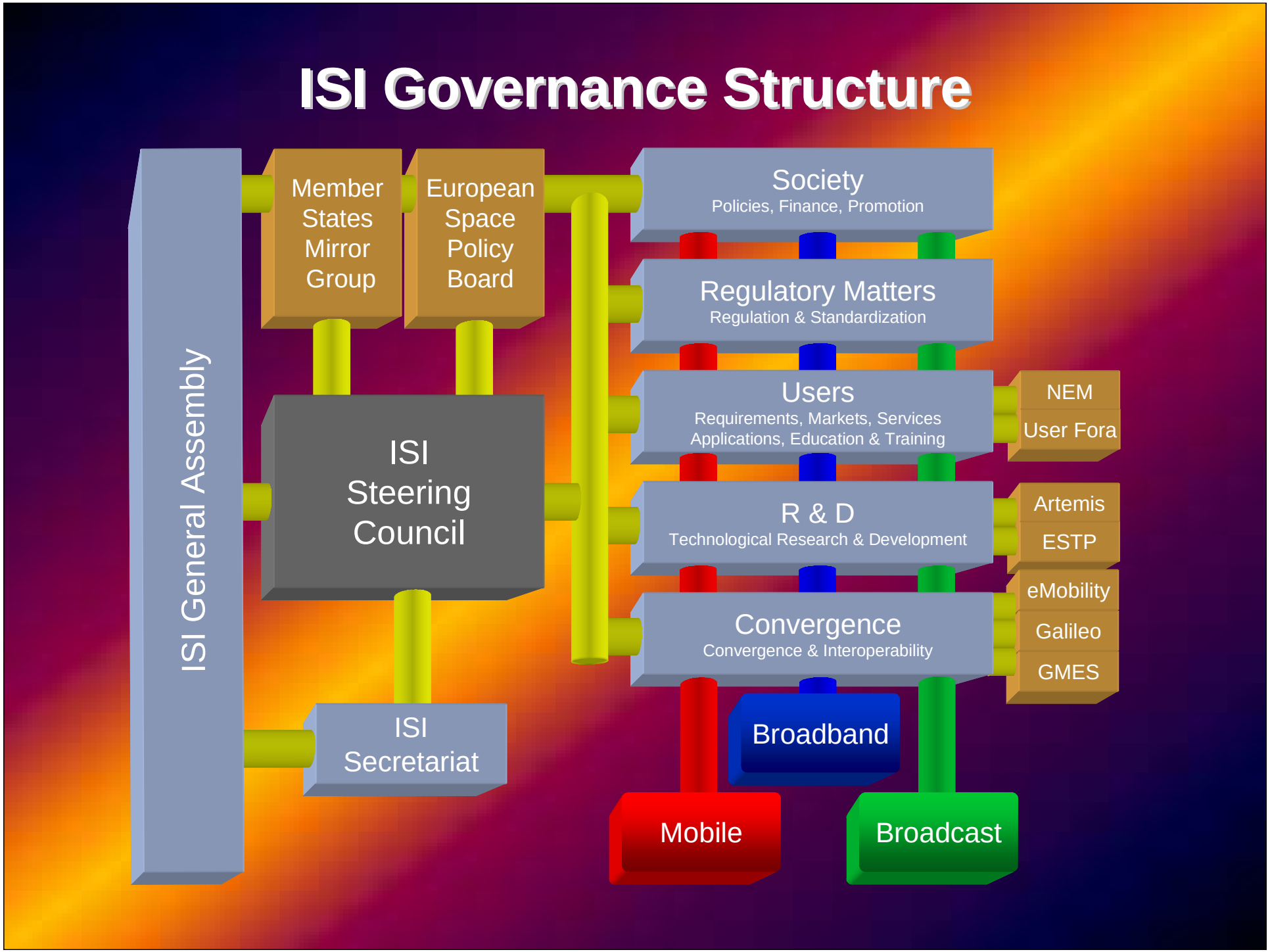

European Commission
esa
alphasat
GLOBAL TELECOM INFRASTRUCTURE
CITIZENS & GOVERNMENTS
GMES GALILEO SECURITY
EUROPEAN INFORMATION SPACE
REGULATION STANDARDIZATION
HW & SW TECHNOLOGY
CONTENT & SERVICES
Mobile
Broadband
Broadcast
ISI
MEMBER STATES
NATIONAL AGENCIES

ISI Key Concepts

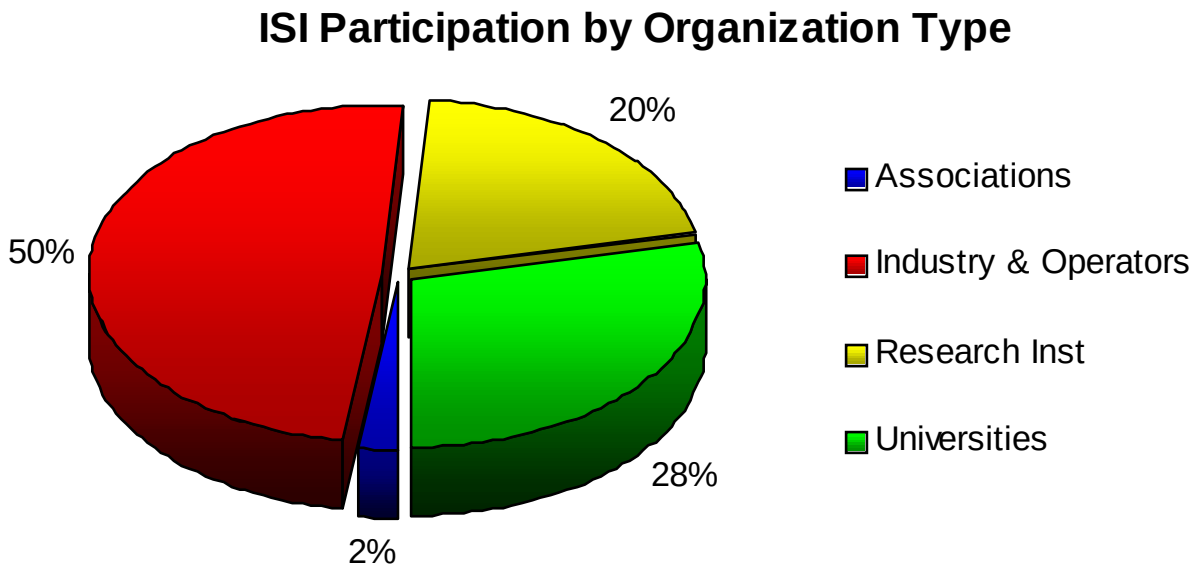
- Convergence: opportunities and threats
- Need for a healthy industry
  - Competitive Industry & Strategic Institutional assets
- International approach is both natural and necessary
- Open standards are the key to expanded markets
- Harmonized regulatory framework
- Challenges: architectural, technical, economical
- Focused R&D: innovation is a must
- Investments: public and private, FP7, ARTES, National programs


ISI Governance Structure
ISI General Assembly
Member States Mirror Group
European Space Policy Board
ISI Steering Council
ISI Secretariat
Society
Policies, Finance, Promotion
Regulatory Matters
Regulation & Standardization
Users
Requirements, Markets, Services
Applications, Education & Training
NEM
User Fora
R & D
Technological Research & Development
Artemis
ESTP
Convergence
Convergence & Interoperability
eMobility
Galileo
GMES
Broadband
Mobile
Broadcast

ISI Constituency

ISI Participants keep increasing. Presently, there are more than 110 institutions from 17 different Countries:

- Austria
- Belgium
- France
- Germany
- Greece
- Hungary
- Israel
- Italy
- Luxemburg
- Norway
- Russia
- Slovenia
- South Korea
- Spain
- Switzerland
- United Kingdom
- USA



ISI Constituency

The need of be organised is focused also in national levels:

- **The example of Spain that launched in February eISI**
- **Other Technological Platforms last year, like eNEM, eMOV, eSEC, …**
- **TP as a KEY European issue to build a competitive market.**

ISI Strategic Research Agenda

The ISI Working Groups:

1. SATELLITE BROADBAND
2. SATELLITE BROADCASTING
3. MOBILE SATELLITE SERVICES (MSS)
4. INTEROPERABILITY & INTERWORKING
5. SECURITY, INCLUDING DUAL USE
6. POSITIONING WITH RESPECT TO GALILEO & GMES

ISI Strategic Research Agenda

1. SATELLITE BROADBAND

System and Network Aspects

- It is of major importance that the strategic research elements for broadband satellite services have focus on **system solution and technologies that lead to satellite broadband systems with very high capacities**, and technologies that enhance the utilization of satellite links.

Space Segment Aspects

- One of the key elements in making broadband satellite services successful commercially is significantly **lower space segment costs relative to what is available today**. The overall capacity per satellite has to be significantly increased, and the space segment related research elements should have significant emphasis on technologies facilitating this. Exploration of satellite communication payload technologies utilising Ka-band (20-30 GHz), V-band (40-75 GHz) and W-band (80-110 GHz) is another important area for future research. The emphasis should be on new payload technologies leading to reduced payload mass and volume, hence reducing the overall spacecraft and launch costs.

ISI Strategic Research Agenda

1. SATELLITE BROADBAND

- **Ground Segment Aspects**
  - The ground segment typically includes both satellite access terminals and gateway stations, where the gateway stations also may include network control centres. It is an indisputable clue that focus has to be on research addressing **increased performance, high reliability, low costs, flexible, low-cost and easy-to-use satellite access terminals, and gateway stations capable of handling a very large number of users**.

- **Applications and Services**
  - **Broadband applications and services that could difference Satellite infrastructure.**

ISI Strategic Research Agenda

2. SATELLITE BROADCASTING

System and Network Aspects

- **Examples of the main strategic objectives:**
  - Quality of service mechanisms for multicast and broadcast systems.
  - Efficient resource management for satellite digital multimedia broadcasting (S-DMB).
  - Efficient Packet Scheduling mechanisms for QoS support in the presence of mixed traffic and fading satellite radio propagation channel.

Space Segment Aspects

- The most convenient feature of satellite is their inherent capabilities for information broadcasting. Broadcast satellites typically have a few, but large beams, covering very large geographical areas. At the same time, the radiated power in the beam should be sufficiently high in order to **allow small and low-cost satellite receivers**. Wide geographical beams with high radiation power will continue to be a highly desirable feature of broadcast satellites in the future. However, the new DVB-S2 standard introduces new modulation formats that lead to enhanced utilisation of the frequency spectrum allocated to broadcast satellites. This is particularly important for satellite broadcasting of HDTV, for which DVB-S2 is a powerful signal transmission technique. But, in order to benefit from the full effect of these new modulation formats, **the satellites must have much higher radiated power than today**. In addition, **the new modulation formats require that the satellite transponders be linearised**.

ISI Strategic Research Agenda

2. SATELLITE BROADCASTING

Applications, Services and Content

- **For a suitable development and management of content and services, it is necessary to adapt the available technologies and tools.**
  - **Research and development of authoring tools for content and open services**, including models which allow the aforementioned adaptation of content and services to the user context in every situation.
  - Study how **Web Services technologies**, automated code generation tools, XML-based data, interface and interaction description languages **should be enhanced to permit integration of platforms, services, access networks and devices**.
  - Design of simpler and more powerful **technologies for application development and test**, as well as validation **of scenarios through simulations and demonstration activities**.
  - …

ISI Strategic Research Agenda

3. MOBILE SATELLITE SERVICES (MSS)

- Thematic Priorities (TPs) **which focus on specific user application areas**. They are addressed in summary form in this assessment of MSS research issues, in the following order:
  - Mobile Broadband access
  - S-DMB: Satellite-Digital Multimedia Broadcasting
  - 2G and 3G service and coverage extension
  - Mobile broadcasting and multicasting
  - NAV-COM
  - Security and disaster relief
  - 4G Evolution
  - Ad-hoc networks
  - SatCom for Air Traffic Management

ISI Strategic Research Agenda

4. INTEROPERABILITY & INTERWORKING, (*including network management and quality of service issues*)

- As presented in ISI's Strategic Vision Document, the convergence moves in the telecom world set **several trends that satellite has to follow in order to develop its place for future telecom applications**. The main trends are:
  - Multiple services are offered on the same networks building upon IP technology.
  - Broadcast, multicast and unicast services are evolving with the introduction of new formats and new ways of service consumption.
  - Service continuity is maintained everywhere between different heterogeneous networks: wired and wireless, fixed and mobile.
  - Telecom networks are connected to the home networks.

ISI Strategic Research Agenda

5. SECURITY, INCLUDING DUAL USE

- Space is a strategic asset. Europe has always maintained an important presence in space. In this sense, space as strategic and multiple-use technology is a **key instrument for a comprehensive approach to security**. Improving security is one of the most important contributions which space technologies and services can offer.

ISI Strategic Research Agenda

5.- SECURITY, INCLUDING DUAL USE

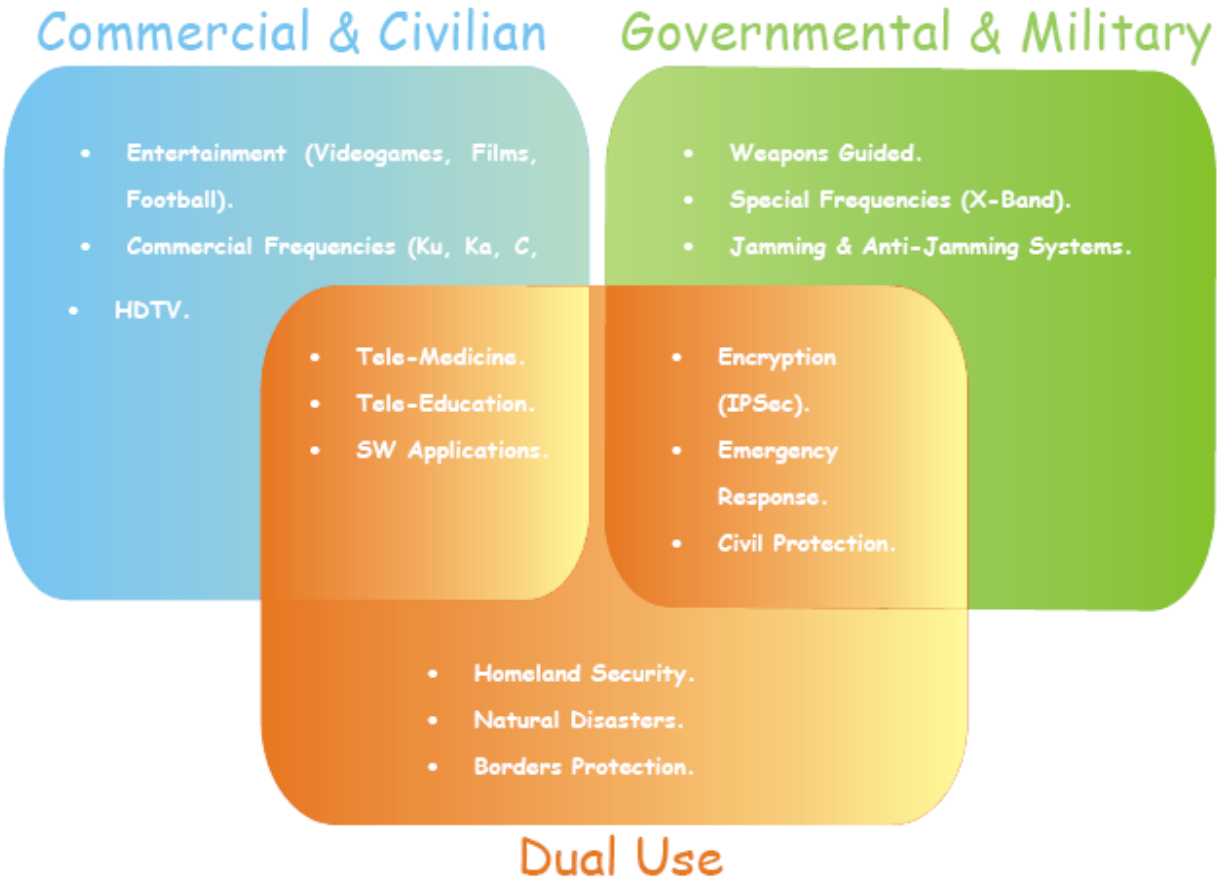


Figure 1. Typical Satellite Applications and Classification within "Commercial & Civilian", "Governmental & Military", and "Dual Use".

ISI Strategic Research Agenda

6.- POSITIONING WITH RESPECT TO GALILEO & GMES

- Satellite Telecommunication, Navigation and Observation Systems are the three fundamental space infrastructures that make possible the development of applications and the provision of integrated value-added services which fully meet the highly fragmented user demand
- SRA Key elements:
  - General concepts driving ISI's positioning in relation to Galileo and Gmes
  - Elements related to the ISI positioning with respect to Gmes
  - Elements related to the ISI positioning with respect to Galileo

ISI: Market Segments

In practical terms, a classification of satcom users into five macro-categories has been adopted

1. **Citizens and Governments: the CG institutional market**
   - **Security, public protection, disaster relief**
2. **Individual users and families in their Homes: the IH market**
   - **Enhanced and interactive Broadcasting, HDTV, 3DTV, IP-TV**
3. **Individual users on the Move: the IM market**
   - **4G, Mobile Broadcasting, Infomobility**
4. **User Groups in villages and Remote areas: the UGR market**
   - **Broadband direct access and backhaul connectivity**
5. **User Groups on the Move: the UGM**
   - **Mobile broadband for aero, maritime, railway, vehicular user platforms**

The key research themes of ISI:

1. Individual Spectrum availability with efficient spectrum use
2. Higher frequency bands
3. Flexible satellite missions
4. New satellite technologies, lower costs, faster deployment
5. Interworking with terrestrial networks
6. Urban and in-building coverage
7. Dual use
8. Interworking with Galileo and GMES
9. High performance with low cost
10. Open standards
11. Regulation

ISI Documents

- **ISI Vision Statement**
  - **approved**
  - **Signed by CEOs, Presidents, Directors, Rectors**
- **ISI Strategic Vision Document**
  - **approved**
- **ISI Strategic Research Agenda**
  - **Version 1.1 released**
- **All documents available on the ISI website**
  - **www.isi-initiative.eu.org**

SME Challenges

- Technology Platforms are a new tool to define the European Strategy Priorities
- There are some open windows waiting for your contributions
  - ISI, NEM, eMobility, NESSI, …
- Now you have voice to show where you can research
- TP are a good environment to see where the R&D is currently going
- TP as new opportunity to be involve in FP7 projects
- Please decide yourself: where are you going to research?
  - Inputs for SRA

SME Challenges

Vision is the art of see invisible things

(Jonathan Swift)

That’s easier because is so clear. Let’s go to build Europe.

(Diego Soro)

ISI Strategic Research Agenda

Thank you!

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Rose vision