

Smart Agriculture: The challenge of integration



Final Workshop - January, 20th 2016



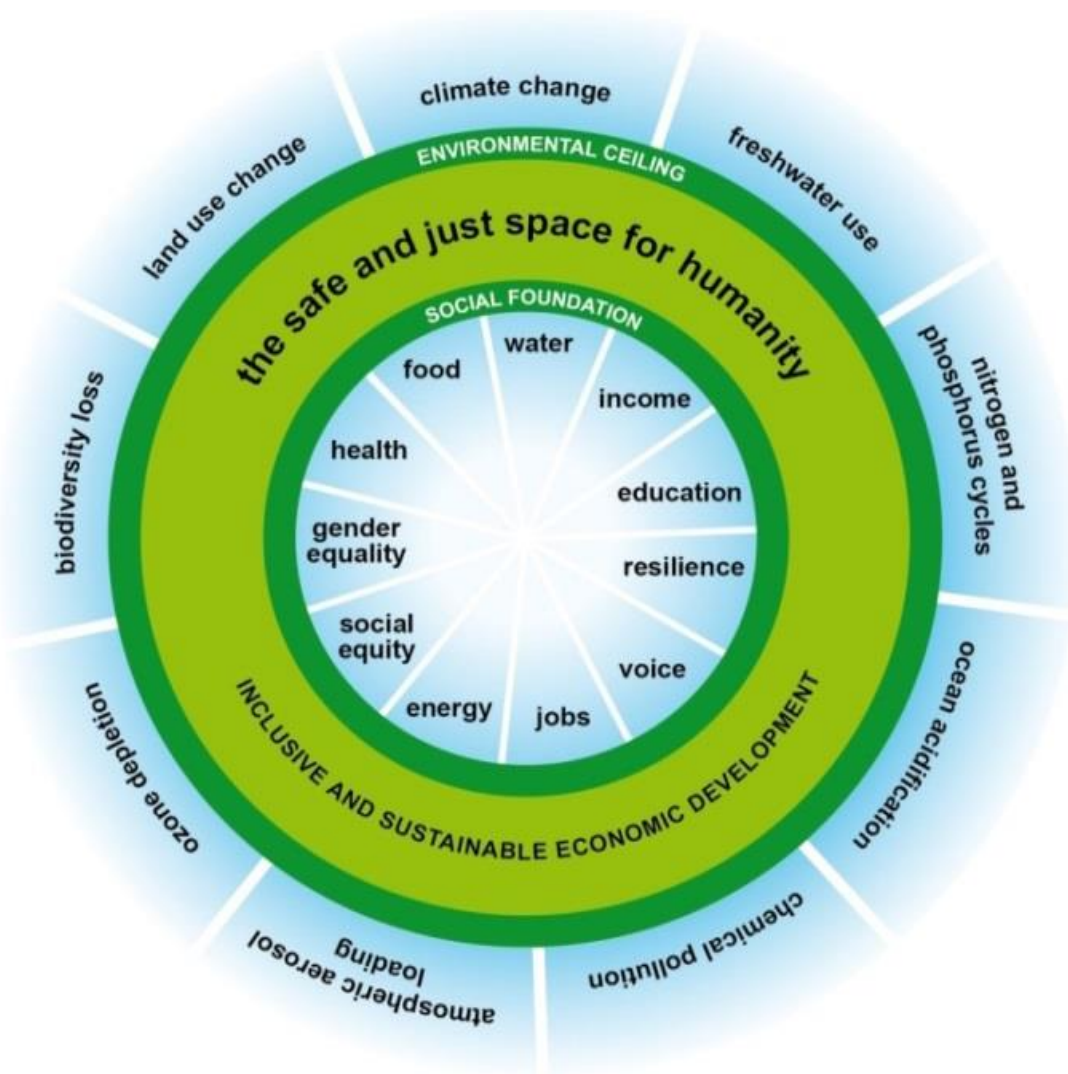
SPACE
ENGINEERING

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The oral report is complementary to the following pages, which therefore do not make up the presentation by themselves

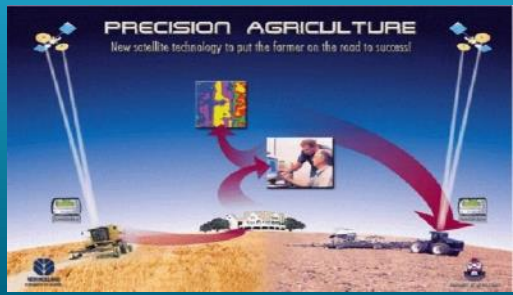
SOCIAL PRIORITIES



Analysis of present agricultural situation reveals 11 social priorities, which can be grouped into three clusters, focused on enabling people to be:

- ✓ **Well:** through food security, adequate income, improved water and sanitation, and health care;
- ✓ **Productive:** through education, decent work, modern energy services, and resilience to shocks;
- ✓ **Empowered:** through gender equality, social equity, and having political voice.

FROM GREEN REVOLUTION TO SMART AGRICULTURE



Food security after the World War 2 ... the importance of group activities in rural communities: 1-haymaking, 2-reaping, 3-grape harvest, 4-olive picking



che colgono olive verdi da posta in una sola pianta. 1896. (Fototeca Georgofili - Fondo R.E.D.A.)

SMART AGRICULTURE IS A HUGE UNIVERSE

FOOD SECURITY where, how much, how to manage it, how to increase it, how to make it profitable [i.e. auto-steer= + 10%];

WATER AVAILABILITY “rates of water extraction for irrigation are exceeding rates of many places”;

SOIL QUALITY “soil quality is a critical factor globally” [i.e. erosion, salinization];

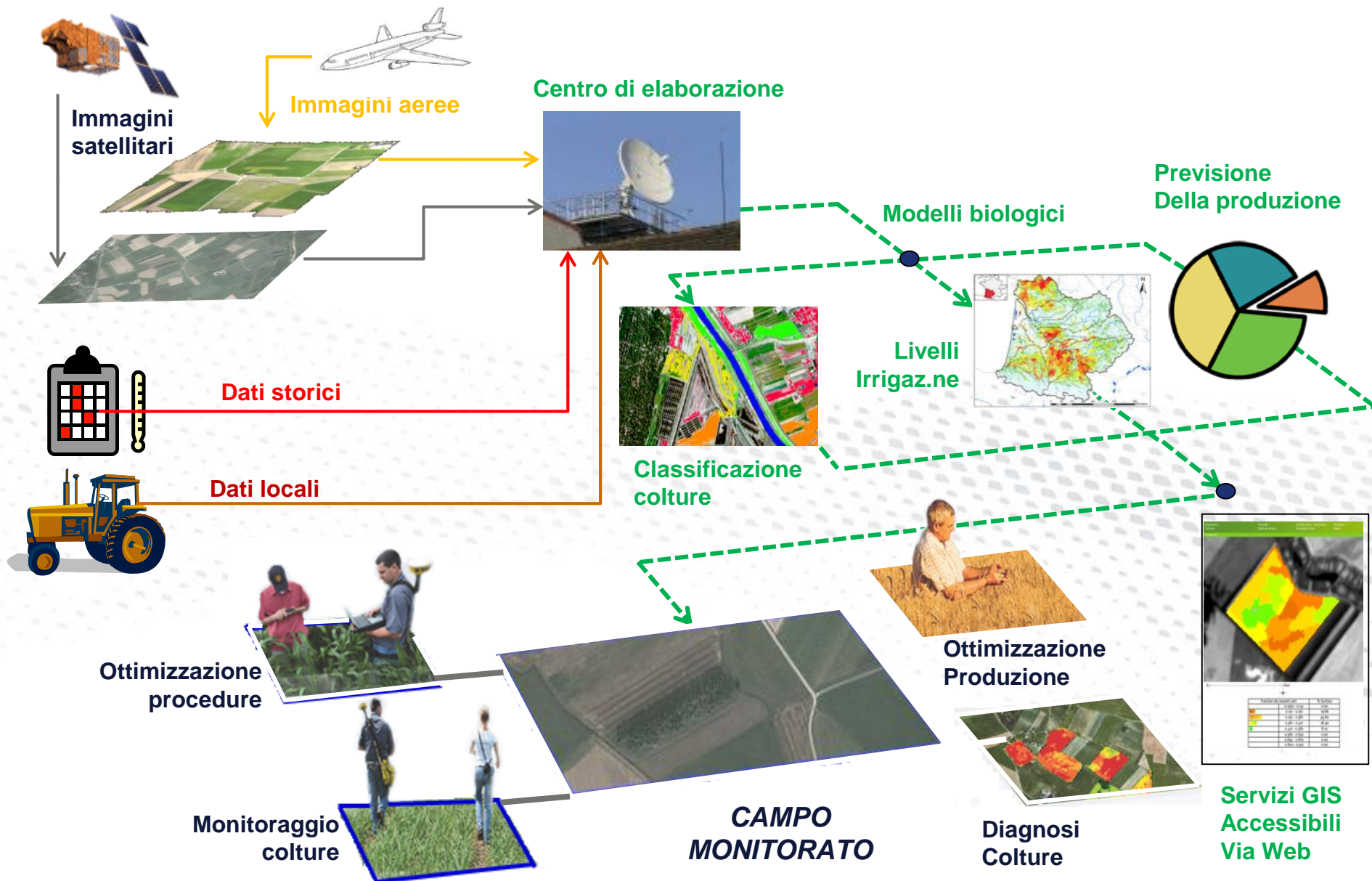
LAND AVAILABILITY “the global crop land availability is in decline”;

PESTICIDE-HERBICIDE WASTE AND RESISTANCE “growing number of cases of herbicide resistance” but more increasing technologies to detect disease [i.e. the scab disease];

ENERGY COST AND AVAILABILITY “energy demand could be double between now and 2050”. Precision farming increases yield by 16% reduces fertilizer input - 5%, herbicide - 65%, fuel - 27;

ENVIRONMENTAL PROTECTION: “many of the current approaches will continue to degrade the environment and compromise the world capacity to produce food in the future”

INTEGRATION: THE CORE OF A NEW APPROACH



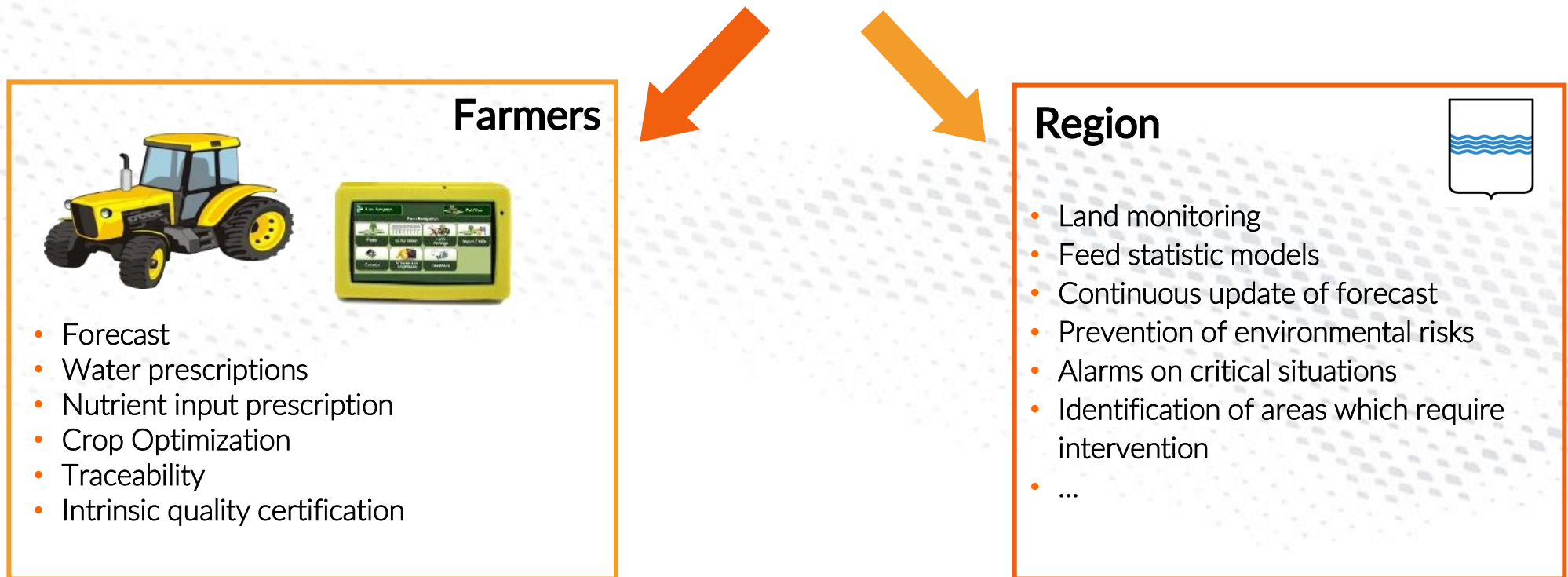
REGIONAL PLATFORMS: AN OPPORTUNITY

Smart Agriculture comprises a huge universe of techniques and technologies

In general, it is not profitable to use one single application.

This is even more evident for Small Family Farms

A common regional platform can offer low-cost services for decision support to a wide range of farmers as well as to the regional government



SMART AGRICULTURE REGIONAL PLATFORM

A Smart Agriculture Regional Platform will integrate terrestrial and space technologies to provide Smart Agriculture Tools and Services

A Smart Agriculture Regional Platform will on one hand serve agri-food companies in order to optimize production and provide automatic tracking and certification of products, and on the other will be used by Regional Governments to obtain reports and data on the usage of resources and the state of the environment

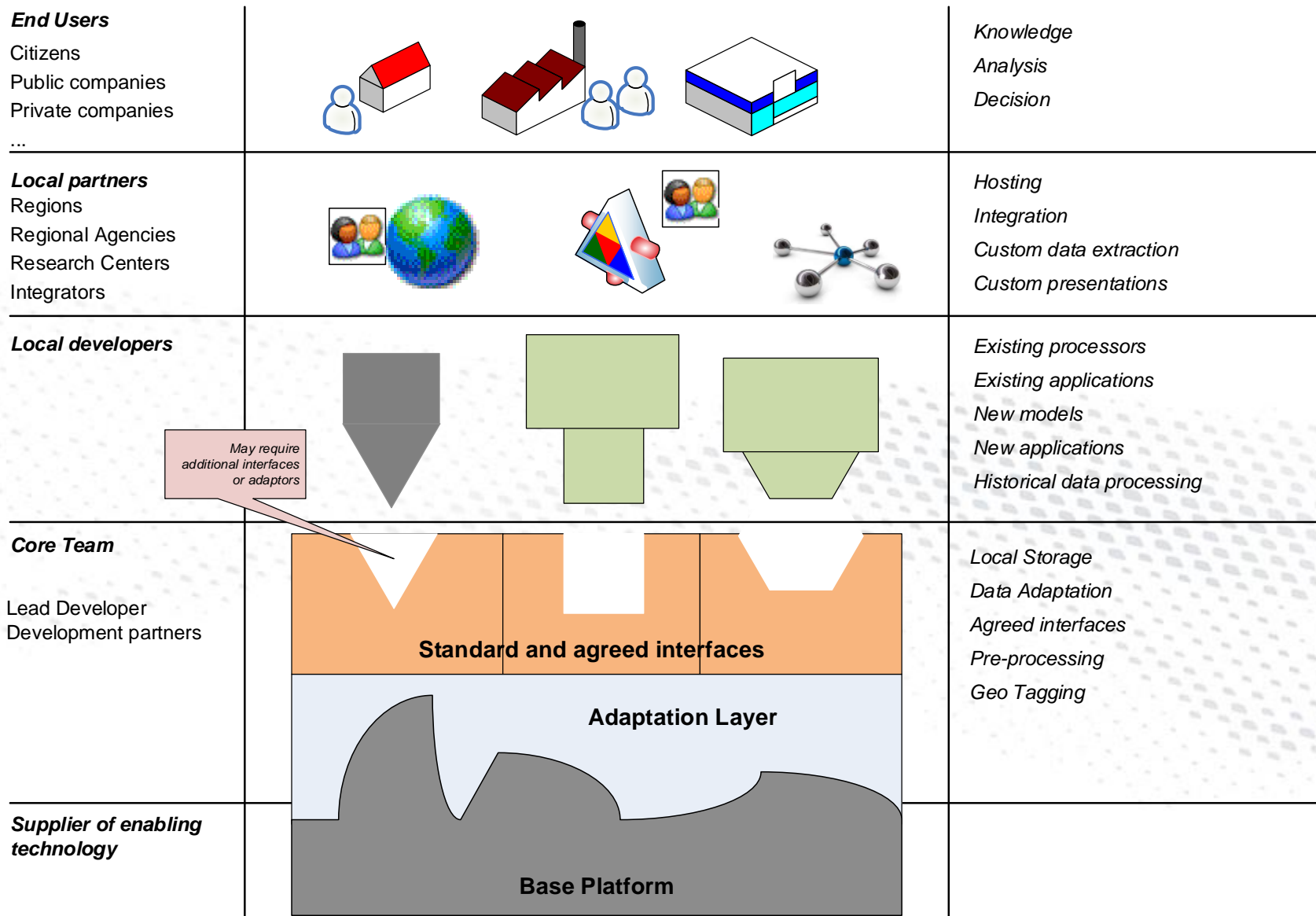
Development of the such platforms will require different skills, ranging from end-users (farming companies) to research institutions to SMEs

The Regional size is a key factor to activate all the different actors including Public Administration, Farmers, Consumers, Research Institutions, Industries, Training Agencies, etc.

KEY BENEFITS

- **New High-Level Jobs linked to agriculture!**
- Dramatic improvement of **sustainability**
- Better **traceability** of the production chain
- **Promotion** of products with intrinsic quality certification
- Strong information support to the **decisions**
- Better **quality of harvest**
- **Prevention** of natural disasters
- **Quick identification** of the areas that need intervention by the regional agencies
- **Control** of natural resources

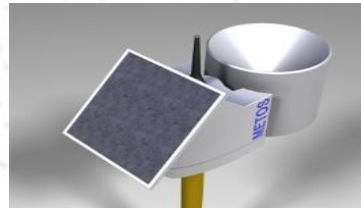
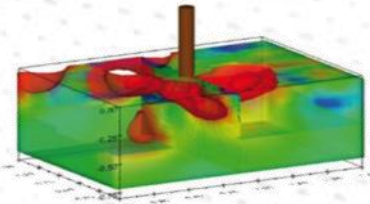
THE REGIONAL PLATFORM ACTIVATES WHOLE SECTOR



KEY TECHNOLOGIES

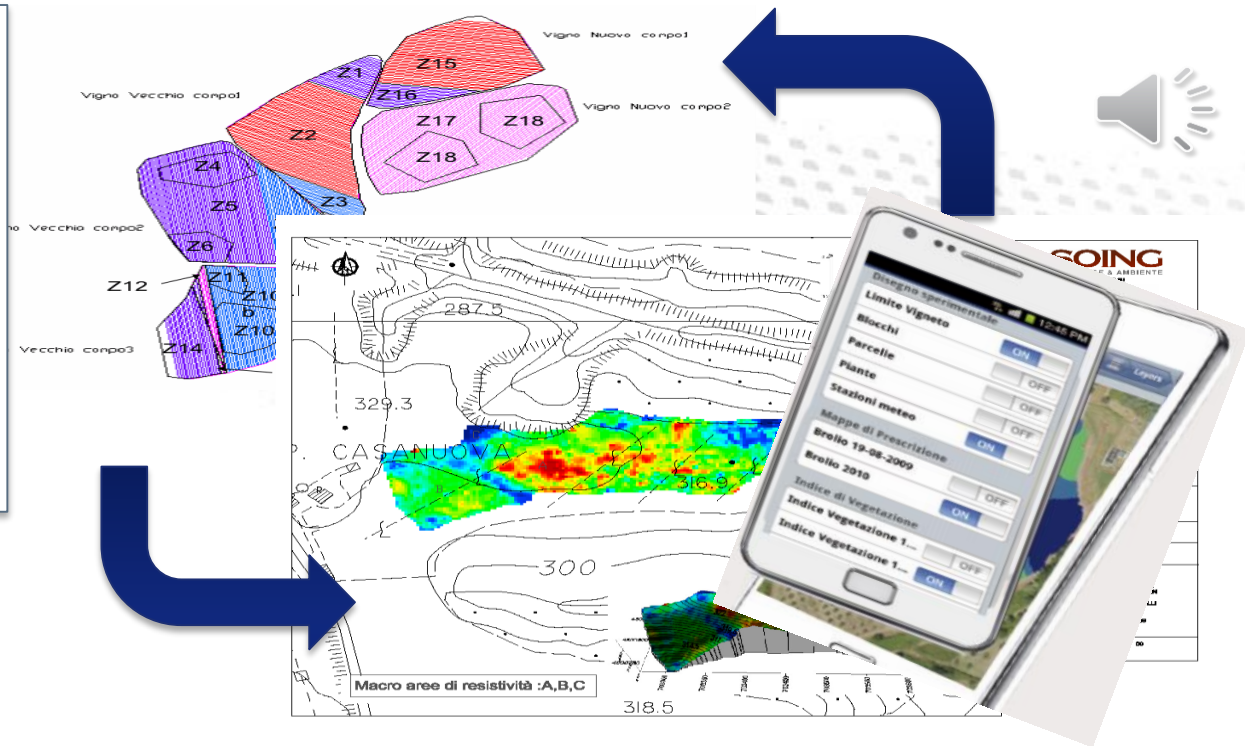
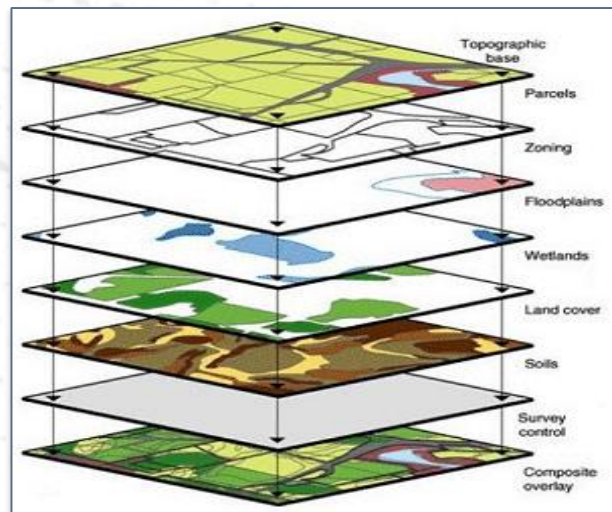
- Earth Observation from satellite and UAV
- Precise satellite navigation
- Image processing -> multispectral maps
- Wireless sensor networks on ground and onboard
- Innovative micropolarimetric radars
- Precise navigation systems
- Geographical Information Systems and Geodatabases
- Command and control onboard of machinery
- Data fusion
- Integration models and SOA

KEY TECHNOLOGIES: SPACE AND TERRESTRIAL

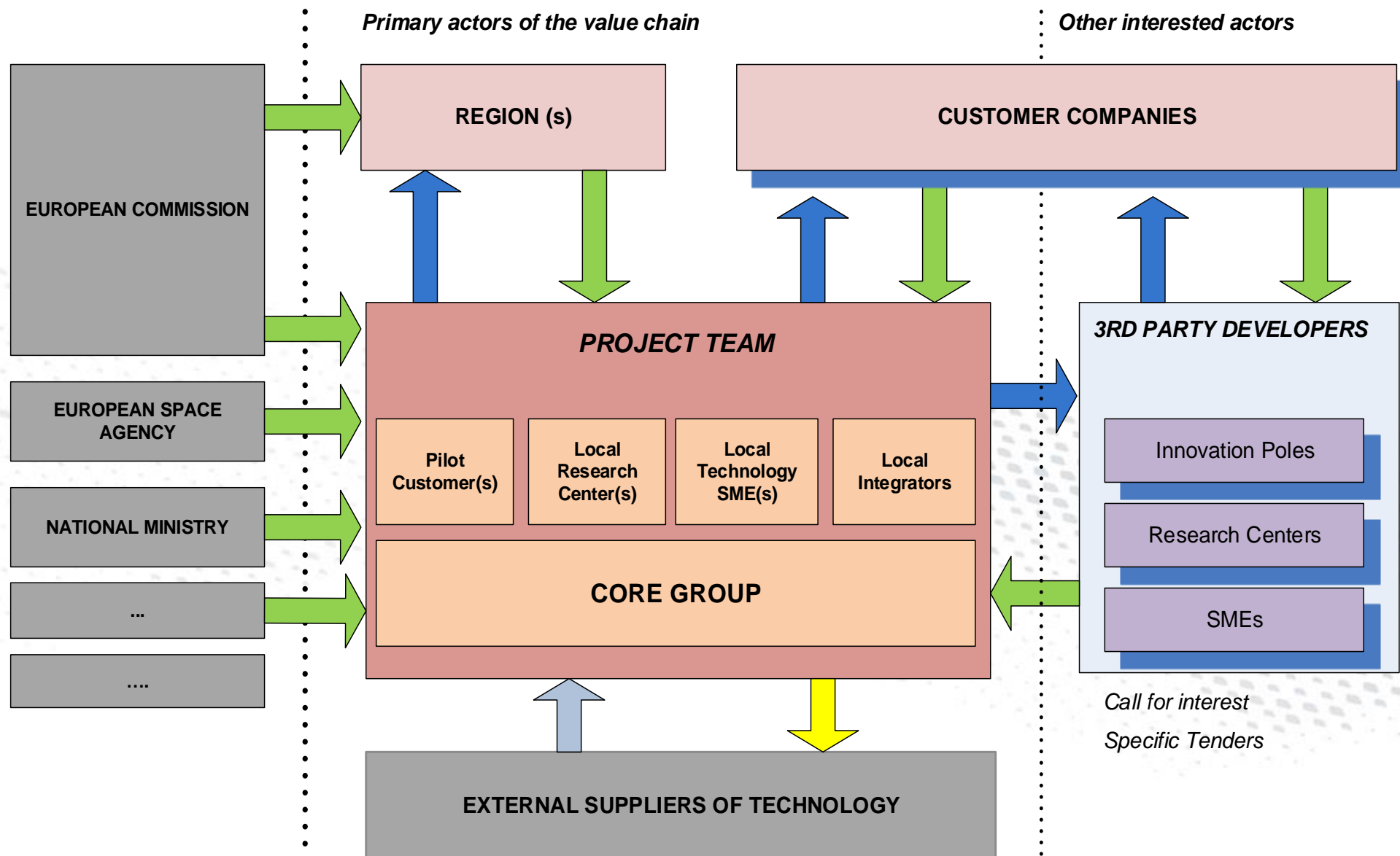


THE DASHBOARD FOR DECISIONS

Correlation of historical and current data to produce information able to support decisions from everywhere: **the tool for the new generation farmers**



ROLES AND ACTORS



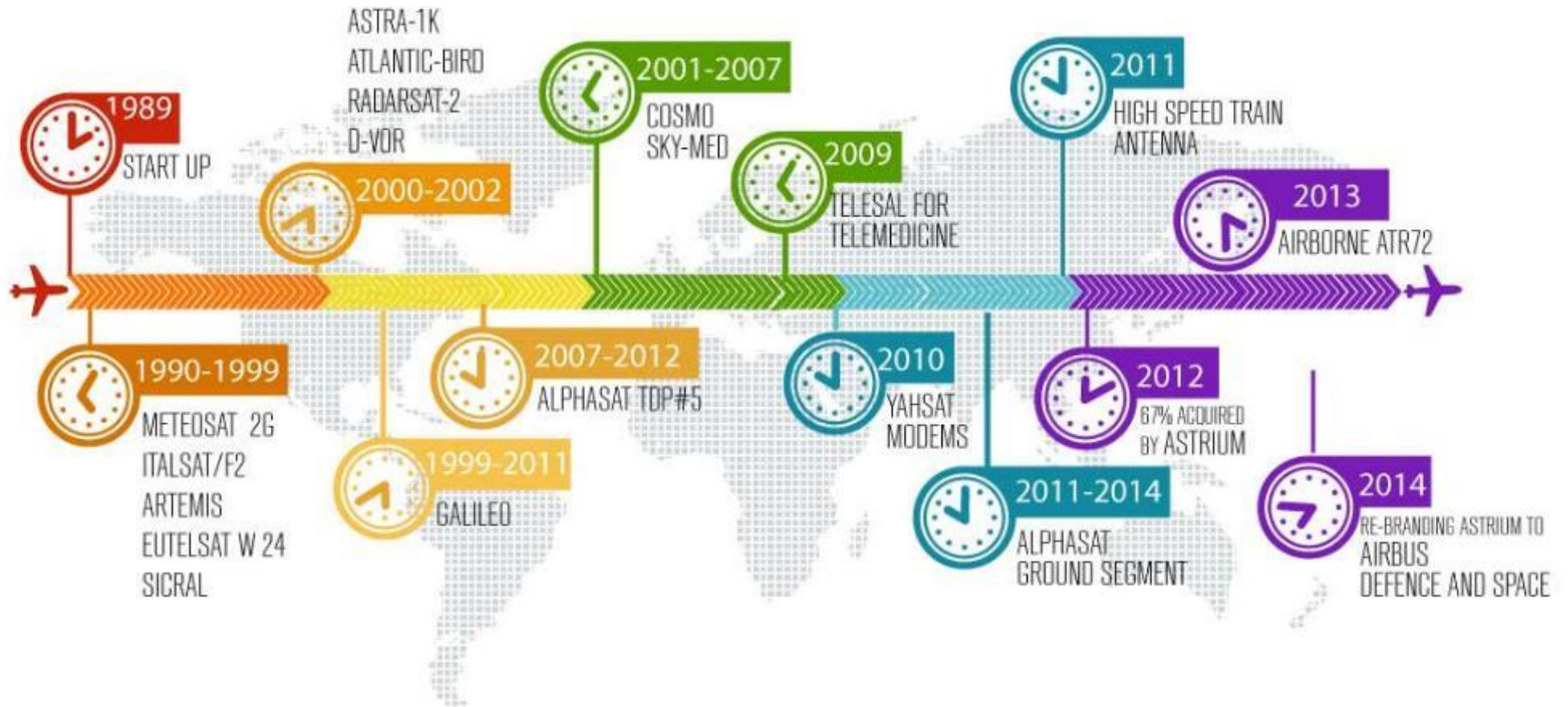
SPACE ENGINEERING AT A GLANCE

Space Engineering is a frontrunner Italian space company with more than 25 years experience in space technologies, now part of the world leading Airbus Defence and Space, Space Systems.

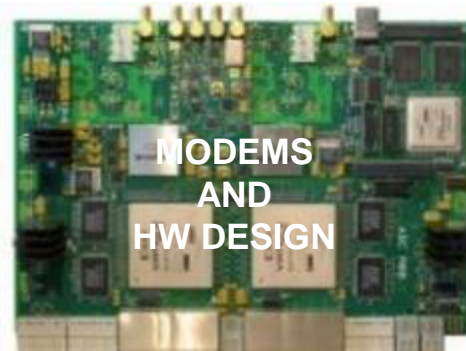
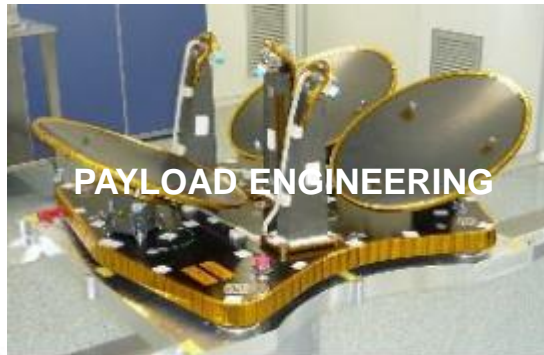
Space Engineering stands as a reliable partner for space agencies, satellite operators and leading companies in the space domain, with a significant amount of projects worldwide, such as in Europe, Israel, Russia, Turkey, United Arab Emirates, Argentina and others.

Space Engineering has attained exceptional know-how and strong international reputation thanks to the participation to several programs (e.g. CASSINI, SICRAL, COSMO SKYMED, GLOBALSTAR, ALPHASAT, QUANTUM, MWI, SAOCOM and many others).

A LEGACY OF EXPERTISE



MAIN PRODUCTS AND SERVICES



MAIN CUSTOMERS AND PARTNERS



SPACE ENGINEERING IN TITO SCALO (PZ)

The Space Engineering plant consists of 4500 sqm internal area including:

- Anechoic Chamber (12x8x7) for test above 450 MHz
- Climatic Chamber (1.3x1.3x1) in range -75-180 °C
- Thermal Vacuum Chambre Simulator
- Clean Room (about 200 sq.m)
- Test equipment for measurements up to 70 GHz
- Motion & Attitude Simulator for mobile terminals
- Digital, RF and Mechanical Laboratories
- Van-mounted Mobile Laboratory

The facilities are used for Integration of electronic equipment with emphasis on communications and space (antenna systems, repeaters, ground terminal equipment, etc.).

Validation & qualification of components for space applications (antennas, repeaters, baseband equipment)





Thank you

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