

KOREA – AUSTRIA – AN EXAMPLE OF A CO-OPERATION BETWEEN DATA PROVIDER AND DATA USER ACROSS THE CONTINENTS

F.P. KRESSLER¹, Y.S. KIM², G. TRIEBNIG³, C. HOFFMANN⁴, C. SCHILLER³

¹ARC Seibersdorf research, Department for Environmental Planning, 2444-Seibersdorf, Austria
florian.kressler@arcs.ac.at

²Korea Aerospace Research Institute (KARI), Satellite Operation & Application Center, Yusung, Taejon, Korea
younsoo@kari.re.kr

³ARC Seibersdorf research, Intelligent Infrastructure and Space Applications, 2444-Seibersdorf, Austria
gerhard.triebning@arcs.ac.at; christian.schiller@arcs.ac.at

⁴GeoVille GmbH, 6020-Innsbruck, Austria
hoffmann@geoville.com

ABSTRACT

Data provider and data user are linked together by suitable data. This implies that for a successful relationship the provider knows what kind of data, whether original or processed, is needed by the user and that the user articulates his needs to the provider. The co-operation between Korea and Austria aims at identifying these needs and to provide suitable routines for the processing of satellite data. Partners of this co-operation are the Korea Aerospace Research Institute, ARC Seibersdorf research and GeoVille. While the focus of the former lies in the development and running of satellite systems, the latter two have experience in the development and set up of applications in the field of remote sensing. Based on the complementary know-how by the institutions involved, projects were set up in Korea and Austria to fulfill this need and establish a pilot data feed for governmental applications.

Key words: KOMPSAT, Korea, Austria, co-operation, and application

1. INTRODUCTION

A co-operation between data provider and data user and developer of methodologies may be described as a classical win-win situation. For the provider it is the opportunity to improve his products based on the user's

experience and to draw on his know-how. For the user it is the opportunity to have access to new data and to tune his methods to fit in with the needs of the data provider. In addition, with today's communication tools distance is not an issue any more. The co-operation, presented in this paper is such a situation where the partners are located on different sides of the globe and complement each other in their know-how.

An initial project called CitySat between SaTReC (Satellite Technology Research Center), ARC Seibersdorf research (ARCS) and the Austrian contractor GeoVille, funded by the European Commission, created the basis of the present co-operation. After the successful conclusion of this project a Memorandum of Understanding (MoU) was signed between the Korea Aerospace Research Institute (KARI) and ARCS in March 2001. The cornerstones of this MoU are the exchange of information, research material and data, to conduct joint projects of applied research and the exchange of visiting scientific fellows and engineering staff. The relationships between Korea and Austria were further strengthened by a MoU between the Ministry of Science and Technology (MOST) of Korea and the Federal Ministry of Traffic, Innovation and Technology (BMVIT) of Austria in September, 2002.

On the strength of the MoU between ARCS and KARI a second project was initiated in 2001 which was approved by MOST in September, 2001 and by the

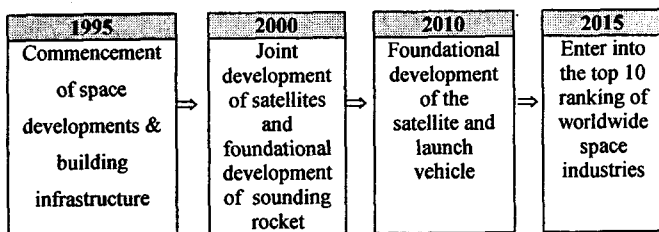
Austrian Space Agency (ASA) in July, 2002. In the next section the space programs of Korea and Austria will be outlined. This is followed by a description of the project partners KARI, ARCS and GeoVille. Next the aims of the co-operation and planned outcomes will be presented followed by an conclusion and an outlook.

2. SPACE PROGRAMS

The space programs of Korea and Austria are very different, both in size as well as priorities. In the following section the basic principles of both programs will be outlined.

2.1. THE KOREAN SPACE PROGRAMS

The Korean space programs have mainly three objectives. 1) To achieve the capability of launching micro satellites by 2005. 2) Foundational development of low orbital multi-purpose satellite and launch vehicle by 2010. 3) To enter into the top 10 ranking of worldwide space industries by 2015.



The implementation strategies for these objectives are as follows;

1. The Comprehensive Coordination of R&D in Space Technology
2. Strong Links between Company-University-Research Institutes

The detailed descriptions of the Korean Space Program are presented in the “National Space Program (2000-2015)”, which was published by the Ministry of Science and Technology (MOST).

2.2. THE AUSTRIAN SPACE PROGRAM

The space activities of Austria are based on three pillars. One is the mandatory program of ESA (European Space Agency), of which Austria is a member, which offers the opportunity to take part in scientific (hardware-) development. The second is the optional participation in ESA-programs, which makes it possible for Austria to take part in user-oriented technological programs such as telecommunication, navigation, earth observation, and so forth. The third is the Austrian Space Program (ASP). The aims of the ASP are as follows (ASP, 2002):

- positioning Austria in the commercial sector through targeted subsidies;
- support of international co-operation;
- support of the development of market-ready products and services,
- demonstration of the application of space technology in the science and public infrastructure.

The Austria space activities are mainly financed by the BMVIT with a budget of about 45 million € per year. (ASASPACE, 2002). The ASP has a volume of 7.27 million € for 2002. It is out of this budget that the Austrian project (AKKURAT) of the co-operation is funded.

3. PARTNERS OF THE CURRENT CO-OPERATION

3.1. ARC SEIBERSDORF RESEARCH

ARC Seibersdorf research GmbH (ARCS) is Austria’s largest contract research organization. It is a subsidiary of the Austria Research Centers (ARC) holding. Competences lie in the fields of electronics, life sciences, production engineering systems research, IT and telematics, process and environmental technology and advanced materials.

The space activities of ARCS lie in the fields of materials research (testing and development of materials

for use in space environments), propulsion systems (engineering of novel ultra-precise spacecraft positioning systems), infrastructures (application of software-intensive systems in space projects and activities in satellite-based navigation and their applications) and Earth observation Applications/Monitoring (utilization of remote-sensing data for natural and man-made environments).

Two units of ARCS participate in the current project. One is the division for "System Research" with the "Department for Environmental Planning", the other the division for "Intelligent Infrastructure and Space Applications". The focus is on optical remote sensing both in basic research as well as application development. Projects on a national but especially international level, both in a European context and beyond, made it possible to build up extensive know-how.

3.2. KOREA AEROSPACE RESEARCH INSTITUTE

The research and development divisions of KARI consists of the Aircraft Division that leads a mid-and small-sized aircraft development program, the Satellite Division that leads the Korea Multi-Purpose Satellite and communication satellites, the Rocket Technology Division that leads development of scientific sounding rockets and satellite launch vehicles, and the Quality Certification and Basic Core Technology Division.

The Mission and Functions of KARI are major duties and functions performance of the basic, applied, and general studies of aerospace technology, support of nationally commissioned tasks and of policy development and support of industrial bodies and technology transfer.

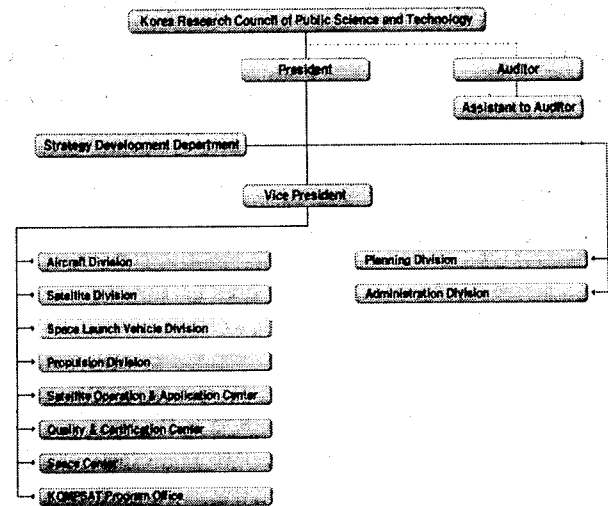


Fig. 1 Organization of KARI

3.3. GEOVILLE

GeoVille is an internationally active consulting firm based in Innsbruck, Austria. It provides products, services and consultancy in the field of digital information systems and specializes in remote sensing and GIS applications. ARC Seibersdorf research and GeoVille have co-operated in a number of projects, among those are generation of a land cover/land use database for the city of Belgrade based on high resolution satellite data within the framework of the MOLAND (Monitoring Land Use Changes) methodology of the European Commission. GeoVille was also a partner in the CitySat project, the forerunner of the current co-operation between Korea and Austria. GeoVille is a distributor for products of a number of satellite operators such as Euromap (IRS-1C and 1D), Eurimage (ENVISAT, QUICKBIRD, LANDSAT, ERS, JERS, KVR 1000, etc.) and Space Imaging (IKONOS).

4. AIMS AND OUTCOMES OF CURRENT CO-OPERATION

The current co-operation is based on two projects: AKKURAT (Austrian-Korean KOMPSAT Utilization and Regional Application Testing) in Austria and KAKUP (Korea-Austria KOMPSAT Utilization Project)

in Korea. In the following sections both projects will be outlined.

4.1 AKKURAT

AKKURAT, carried out by ARCS and GeoVille, is financed by the ASA (Austrian Space Agency) as part of the National Space Program. The project is carried out in close co-operation with the spatial planning division of the regional government of Lower Austria. It aims to produce pilot Earth observation products for regional development from the point-of-view of sustainable development.

The project focuses on two issues of land cover/use in regional areas. One is the identification of artificial surfaces, the other the determination of forest cover. For both land cover types masks will be created which will serve as inputs for the spatial planning department. In addition four test sites will be examined in the province of Lower Austria in greater detail. They represent both urban as well as natural areas and thus allow testing of the suitability of KOMPSAT-1 data in different environments.

The results will provide a direct input in the data collection of Lower Austria. This will demonstrate the potential of using Earth observation data as a complementary source for existing and predefined information generation chains. The derived information will allow a contextual refinement of the currently used heterogeneous data sources.

The products will provide substantial added-value to the Lower Austrian spatial planning directives since they represent methods to:

- produce information on forest and artificial surfaces in a time and cost effective manner,
- reduce existing data deficits (in terms of availability of homogenous data),
- add important information layer through data fusion.

It is expected that the methods developed within this project will also be of value for other applications. Care

is taken to ensure the possibility of automated or semi-automated approaches for the analysis of the data. This should allow an increase in speed of data processing as well as a minimization of the partialities, which are always introduced by an operator.

4.2. KAKUP

KAKUP (Korean-Austrian KOMPSAT Utilization Program), carried out by KARI, is financed by MOST (Ministry of Science and Technology) as part of the International Cooperation Program. It aims to produce pilot Urban-Monitoring & Geographic Information products for regional development from the aspect of sustainable development.

The project focuses on two issues of urban remote sensing. One is urban monitoring using satellite imagery, and the other is updating geographic information.

The results will provide temporal growth tendencies of the Metropolitan City of Daejeon and a prototype of the geographic information updating system. This will demonstrate the potentials of using satellite imagery as a valuable source for existing and predefined information. The information derived can be used in governmental decision making of urban planning.

5. CONCLUSION AND OUTLOOK

The main objectives of the co-operation between Korea and Austria are to join the Korean satellite capabilities and Austrian know-how of data exploitation. This will be demonstrated by the establishment of a pilot data feed for government applications in the regional and urban planning domain.

Korea and Austria both maintain space technology development programs with different but complementary priorities. Korea builds and operates its own satellites which carry sensors for Earth observation. Austrian institutions have developed information processing technology and services for the exploitation of such data. This co-operation is an opportunity to bring these

complementary capabilities together and develop them into operational products in order to serve the market needs for geographical, environmental and multimedia information and services.

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