



Position Paper 'Sharing Space'

Executive summary

Vision/themes

Sharing Space, the smart, multiple and sustainable use of space, is enabled by using IT-supported geo-information for regional planning, localisation, positioning and visualisation, and getting connected to other relevant data. This theme is relevant to a world where there is increasingly too little space for too many people, which is causing problems concerning the quality of life, mobility, logistics, nature and safety. Furthermore, this theme is strongly intertwined with the Netherlands, one of the busiest and most cultivated sharing spaces in the world.

The development of IT-supported geo-information is taking place in a more and more progressive way. From collecting, sharing, and disclosing geo-information to linking and combining this information. And - in a subsequent stage - from making geo-information accessible and understandable to monitor and re-calibrate it. As a result, linking data, virtualising plans and situations and uploading geo-information by everybody, everywhere, will become increasingly normal. So Information and Communication Technology (ICT) offers a platform to create communication between partners in society and sectors that are involved in policy and decision-making. Location-based services, augmented reality, 3 dimensional aspects: all these effective and efficient instruments create a new world with another space.

Sharing space: from static geo-information bulwarks for some of us via IT to worldwide dynamic geo-information networks for all of us.

Intentions

Track Sharing Space aims to realize the next focus:

- ❖ A large scale IT-supported geo-information conference involving all key players, such as IT companies (hardware, consultancy, content), the public sector, users and science, in order to collectively face numerous challenges;
- ❖ Rapidly increasing the awareness of the high relevance of IT-supported geo-information for each society and its spatial issues. A proper management of 'sharing space' touches all of us;
- ❖ To promote strong cooperation between all partners involved in the IT-supported geo-information chain. Further integration between all of them by building more and wider bridges is crucial;
- ❖ To advance open and innovative participant thinking, progressing the sharing of strategic topics and having transparent dialogues about 'geo-information and its decision makers';
- ❖ Declaration of Amsterdam: issuing a statement about the rapidly growing relevance of IT-supported geo-information and the possible creation of an international cooperation and research platform for IT-supported geo-information.

The technological advancement of ICT will lead to a worldwide expansion of the use of digital geographic data. With the possibilities ICT has to offer, Sharing Space will definitely play a growing role in solving the above worldwide issues. This opens a wide perspective of applications. Consumers, businesses and governmental organizations will benefit increasingly from the many useful applications they can use on a day-to-day basis. Finally, a standard Global SDI will ensure the worldwide availability of accurate and exchangeable geo-information to anticipate issues concerning spatial planning, earth observation, upcoming natural disasters and long term trends. Society's deep reliance on such geo-data and structures is definitely growing fast.

Track introduction

Sharing Space, the smart, multiple and sustainable use of space, is enabled by using IT-supported geo-information for regional planning, localisation, positioning and visualisation, and getting connected to other relevant data.

Sharing Space is relevant to a world:

- where there is increasingly too little space for too many people. Demographic and economic developments cause problems concerning the quality of life (e.g. climate change, heavily increasing

demand for food and energy), logistics and safety (*mainly physical aspects of space use and how to intensify this use*);

- where there is also still poverty on a huge scale. Geo-information could clearly help to alleviate deep poverty and inequality in the world (*more socially oriented meaning of sharing space; it gives attention to the urbanization of poverty*). Examples include some of the flooding issues that many poor communities suffer from: geo-information could help us to understand the consequences of changing the course of rivers or adjusting river banks outside national boundaries. Even in the short term, proper management of the Sharing Space in countries like Bangladesh and Indonesia is critical. Efficient use of space on land and water could mean building on water, and in general building the infrastructure. And welfare and well-being significantly depend on a proper and adequate infrastructure. Geo-ICT can therefore play a substantial role in creating 'inclusive spaces' that are accessible to all members of society;
- Furthermore, this theme is strongly intertwined with the Netherlands, one of the busiest and most cultivated sharing spaces in the world;
- Finally, this theme is characterised by rapid IT-supported development. As a result, linking data, virtualising plans and situations and uploading geo-information by everybody, everywhere, will become increasingly normal.

The development of geo-information consists of different phases, which will be described individually.

The definition above shows the core of the track. Outside the core area other tracks within WCIT 2010, like Water, Public Safety and Mobility, may relate to Sharing Space.

Solutions

Geo-ICT will be an indispensable instrument for proper management of the sharing space. Combining geographic data, structures and ICT opens up ample effective and efficient opportunities to handle spatial issues. IT-supported geo-information is created in the following successive stages.

NOW

Phase 1: Collecting, sharing, and disclosing geo-information

Worldwide, many parties are involved in the digitalisation of basic material in the fields of cartography and administration. Land registries want to share the detailed data they have collected over the years, and make these available for new applications. At the same time, the market has attracted many new players such as manufacturers of mobile phones and route planners, telecom companies and internet giants, which are building their own computer file systems to enable specific applications. In the latter category, a growing group of active new players is convinced that linking together geo-information has added value.

Challenge: managing geo-data

There is an enormous amount of geo-information available in the Netherlands, and, by consequence, Dutch companies and organizations operating in this sector are front runners in managing geo-data. Another step is the introduction of the INSPIRE and GIDEON guidelines, including new standards and uniformity for Europe and the Netherlands respectively, leading to a national and European 'Spatial Data Infrastructure' (SDI). Information is standardised and exchangeable within an SDI and therefore easily accessible for different kinds of new applications.

NEW

Phase 2: Linking and combining geo-information

The Dutch administration and agreements enable the establishment of interesting links with other sources of information. WCIT 2010 focuses on this element, because linking and combining geo-information will generate the highest revenues within the theme 'Challenges of Change'.

a. Spatial planning

In spatial planning issues, geo-data will disclose essential information for using space differently. Choices can then be made to enable better use of Sharing Spaces worldwide. Virtualisation and data linkage will help in making future models of this space and predicting how it will be used, even if this involves building underground or three-dimensional models. These techniques will show the consequences of municipal decisions before they are made, for example when the council intends to build a car park underneath a monumental square or houses in the wash-lands.

Smart Cities

There is another new development worth mentioning. 'Smart Cities' are developing integral spatial planning projects and IT infrastructures and at the same time visualising the effects of scarce space on safety and poverty. On a micro-level, the 'Smart Living' concept is enabling households and offices to use available space, time and resources as smartly as possible. The smart meter cupboard functions as a control centre that puts the different flows of information and communication on the right tracks.

b. Localisation, GPS and Location Based Services

Localisation services, offered in various forms to companies and consumers, play a special part in the process of linking and combining geo-information. As a result, the accessibility of (geo)information is increasing. Spatial planning will increasingly become the domain of citizens and companies, rather than an exclusive government theme. The authorities use mobile phones for location purposes, for example to locate possible crime witnesses, send them a text message and even ask them for footage of the event.

Added value

It is always possible to locate citizens with the help of GPS. Today, *added value* comes to location-based services (LBS), that are used regularly for enforcing legal order at events, pointing motorists in the direction of the nearest petrol station or warning them of a traffic jam ahead. Through *augmented reality* it is possible to show extra layers of information -- for instance directions to a nearby cash machine -- on the screen of a smartphone. While walking in a strange city, the LBS system can alert you if there is a record shop around the corner where they have a copy of a rare record by your favourite singer, giving you directions and the price.

Geo-data are linked to the Dutch Waterlines and other cultural heritage monuments for reasons of preservation or to give them a new use. Via LBS, citizens are able to find historic maps of the places where they actually are.

In sports, added value comes to location data that provide additional information during a football match or show the route for runners in 3D via Google Earth. Location data could help solve traffic problems or be applied on a micro-level in healthcare facilities. In science, these data are used for accurate positioning of the sun and other solar systems at research facilities such as LOFAR.

c. Virtualisation

By creating a virtual reality, geo-information can be used predictively in combination with other sources of information, for example to create a model of a future space. After a wind farm is planned, the virtual world can be the platform to test different scenarios based on accessible database information. Local authorities can use virtualisation to train their staff in integrated emergency procedures.

Data linkage can and will also be used to assess the consequences and possibilities of worldwide issues like climate change. The creation of a personal virtual reality might be sufficient for ordinary people. Spectators at the Beijing Olympic Games had the opportunity to watch 12 sports played on different locations at the same time via 12 live streams on the internet and felt they were in the middle of those events.

NEXT

Phase 3: Making geo-information accessible and understandable

IT is becoming an indispensable part of the consumer's everyday life and increasingly personal and accessible. Geo-information is available to users of (portable) consumer electronics in one way or another, supported by an increasing number of LBS applications. GIS-games and applications such as Meteox are also making geo-information accessible to the *masses*.

Satellite applications

Specialised satellite applications can help inform farmers better, enabling them to produce better crops with corresponding revenues. Finally, geo-information can combat social isolation by connecting people to Internet services; applications like Twitter, Jaiku and other social networks strongly promote *social inclusion*.

Phase 4: Monitoring and recalibrating geo-information

Today, the emphasis in the geo-information sector is still strongly on collecting and processing new data. As the sector increasingly matures, the focus on (real) time monitoring and re-calibration of information becomes significantly more important. *In the future* it will be possible to monitor, analyse and, based on set parameters, take decisions on a policy level through a self-learning process. Monitoring the courses of rivers, traffic jams and bird migration routes has great advantages during the process of decision-making in spatial planning issues.

A new development in real time monitoring of space use will also be the help of the *public*. Via cell phones, GPS and cameras current technology will allow virtually everyone to (consciously or not) collect and monitor geo-information. In relation with social media such as Facebook, photosites such as Flickr and Google Earth this information is often shared among thousands. This is the world of *neogeography* or *volunteered geo-information*. As with Wikipedia, one has to be careful about using this type of data in more serious geo-applications. However, certainly not all of it should be considered bad, and it is a challenge to decide which of this information is usable. Our 'formal' geo-information world (national mapping organizations) should consider how to use the data for updating. The Open Street Map (www.openstreetmap.org) is a good example of useful public data. Another example is an experiment with farmers reporting on water supply and quality to the water authorities on Zanzibar (Google.org & ITC).

Governance

Nowadays, innovative ICT-possibilities need to be carefully merged with social, governmental and business needs. ICT offers a lot of new possibilities that can be used to improve the performance of governmental and business organizations with respect to education, safety, health care, international co-operation, economic efficiency (integrated value chains, business process management, reduction of administrative overhead), prevention and detection of fraud and accident and disaster management.

But, although the global sharing space prospects are soaring with the aid of such strong geo-information instruments, there is still a lot to be done. This includes building a European and global network of spatial data infrastructures, containing on-line streams of digitized and harmonized spatial data, and even availability in all developing countries in order to shape their changes.

Governments are thus involved in these geo-ICT developments. It should be clear that IT effectively and efficiently facilitates and supports scenario planning as well as decision-making. Strong cooperation between all partners in the geo-data information chain should for that reason be promoted by these decisionmakers. Open and innovative minds, advancing the sharing of strategic issues and transparent dialogues about 'geo-information' are essential topics. It would be desirable for the key players to make a statement in the Declaration of Amsterdam about the creation of an international platform for cooperation and research on geo-information, at least at the European level.

European component

In the European frame of making geo-information easily accessible to governments, businesses and the public, the Inspire, Eulis and Eurogeographics projects or organizations play a key role. These institutions harmonize and process spatial and administrative data and generate a portal for Europe.

On a global level, the key player Open Geospatial Consortium (OGC) must be mentioned. OGC is an international alliance of business, government and universities, charged with the worldwide development of interoperable standards for geo-spatial and location-based services.

Conclusion

With the possibilities IT has to offer, Sharing Space will definitely play a growing role in solving worldwide issues concerning sustainable use of space, mobility, safety, nature and water management, 3D and underground building. Consumers and companies will benefit increasingly from the numerous useful applications they can use on a day-to-day basis. Finally, a standard Global SDI will ensure the worldwide availability of accurate and exchangeable geo-information to anticipate issues concerning spatial planning, earth observation, upcoming natural disasters and long-term trends.

Hopefully, the Sharing Space track will help to increase social reflection about the relevance of IT supported geo-information and its possibilities for solving many spatial and environmental issues. A widespread use of geographic data clearly serves the world's well-being and prosperity.