The One and Only

The need for accurate and detailed geo-information is tremendous and compelling. This is a worldwide trend, apparent in all countries. Continual migration from rural areas to urban fringes creates the need for planning and construction of housing, facilities, roads, railways and other infrastructure. And, once erected, all these immovable commodities require proper management and maintenance. Countless challenges are involved in the production of sufficient food for a growing world population and enabling farmers to make a living from agriculture whilst preserving the environment. In particular, emerging countries are rapidly altering the surface character of the earth over many areas of their territory. India and China have meanwhile become seminal examples of economic success, with annual double-figure growth rates. However, the territories of smaller countries such as Poland, Czech Republic and Ukraine, are also undergoing a rigorous facelift. The need for geo-information is induced not only by vigorous planning and construction efforts, but also for purposes of land administration to secure property rights. Unfortunately, in many countries cadastre and land administration are still in their infancy, and the World Bank and the United Nations have recognised the need for huge investment in response.

Manual Extraction

Many technologies are in place today to meet these growing demands, at least from the data-acquisition side. We are able to continuously image the world from space at spatial resolutions up to 50cm. Airborne Lidar sensors can create highly automatically Digital Elevation Models, and these, in combination with optical digital cameras, mean geometrically correct images can be produced by computer alone. Integrating large-scale topographic maps with Lidar data and oblique aerial photographs makes for 3D-city models without much human intervention. However, a labour-intensive process is still required for transferring geo-data into information suitable for use in, for example, a GIS environment, where it might be queried along with other spatial and non-spatial information. Geo-data cannot yet be automatically transformed into geo-information. A time-consuming manual process is involved in extracting from the data features obedient to a highly abstract world model defined by the user as needed to support managing his work.

Lapsing Front-end

In the meantime, most countries have marched onward towards establishing a National Geo-spatial Data Infrastructure. NGDI prevents various national-governmental or quasi-governmental organisations all collecting and storing the same geo-information, the sort of overlap that greatly encumbers a national treasury. The undesirability of such glaring inefficiency has been recognisedfor more than fifteen years, and today many countries are well on their way towards resolving it. Various types of geo-information distributed across and maintained by different organisations can now be approached via one NGDI portal. However, what can be approached is the tail-end result of the geo-information production process: vector information extracted from aerial and satellite imagery, Digital Elevation Models created from Lidar data, and so on. The front-end, basic collection of satellite images, aerial photographs and Lidar data, is still separately ordered by each organisation, giving rise to the peculiarly familiar situation of the same type of data being independently commissioned by several agencies, all in the same country. How often does it not happen that the same piece of the earth is flown many times in the same year…because a municipality has ordered aerial photography of its entire territory, and provincial authorities also happen to want an overview of a certain type of landscape under their domain. And national government wishes to construct a railway line between two cities, which crosses municipal boundaries, while a water board has discovered photogrammetry to be a cheap method of inspecting dikes… And all with just a very few, slightly differing specifications with respect to main, defining parameters such as scale and weather conditions. This is, of course, very good news, economically speaking, for the service provider. But not so good for the national treasury, a truth all the more striking when it concerns developing countries. Taxpayers' money is spent or, better said, wasted in purchasing a geo-data product already in the taxpayer's possession. This is point number one.

Acting Autonomously

Point two is that this wastage may be mainly traced back to policies of decentralisation and privatisation initiated by the majority of world governments in the nineties. These policies led to drastically increased levels of tax reserves held in (quasi-) government organisations, so that they all resorted to acting autonomously, not least in respect of the acquisition of geo-data. The resultant proprietary mindset nourishes the sense that data is actually owned, and it is only a small step from here to completely losing track of the reality that such data is originally a common commodity financed from the national purse. What should be done to prevent the same geo-data covering the same territory being purchased and collected countless times over? Here the national government and its representative the National Mapping Agency have a pivotal role to play in terms of carrying out annual aerial and Lidar surveys, buying all satellite imagery covering national territory and storing it in a centrally accessible database. The appearance of geo-data has changed drastically over the last two decades, but it seems that thinking at national level is still stuck with the notion of topographic maps as the one and only, ultimate source of geo-information…?