

Geomatics in UAE

Depleting oil resources have led the United Arab Emirates (UAE) to begin investing heavily in other sectors, above all tourism and property. The resulting construction boom means 20% of the world's cranes are presently deployed in Dubai. The author investigates concurrent developments in geomatics services.<P>

Today's oil prices bring a lot of cash to the Gulf, and this money is being wisely invested as a base for future earnings once oil reserves are exhausted. The constructions erected on Dubai's 4000km² are worth US\$300 billion [1]. Theme parks, bridges, shopping centres and skyscrapers are rising at an astonishing rate, some presumptuously dressed with the prefix 'the world's largest'. These mega-projects will transform the region into a major tourist centre, attracting people from all around the world.

Services

Traditional land survey and photogrammetry have been used in the UAE for the past thirty years and are still prominent data-acquisition technologies. However, a look at locally based geomatics companies shows most have been established since the turn of the millennium. Their services include:

- data acquisition: survey, Lidar and satellite-image acquisition
- software use: addressing, geocoding, GIS analysis and image processing
- hardware: vehicle tracking and survey instruments
- applications: environmental, government and retail.

Mapping

Some of the seven Emirates are just beginning to update their base-maps using traditional surveying. To survey large areas, many projects are granted to photogrammetric companies. As one of the fastest growing cities in the world, Dubai contracted Rolta to acquire up-to-date, high-resolution orthophotography. Headquartered in Mumbai, India, with offices in eight countries, Rolta is one of the major companies in the Middle East conducting large-scale mapping, and the leading provider of GIS solutions. With the recent acquisition of Canada's Orion Technologies, the company has strengthened its GIS services. The Middle East department has new management headed by John Sasser, former managing director at Intergraph. Northern Emirates are just beginning to digitise their maps and create comprehensive GIS databases. The actual work is contracted out; for example, to Navayuga Spatial, which focuses on GIS and mapping solutions [2]. The company has successfully implemented the Enterprise-GIS solution for Ras Al-Khaimah, and is now busy with Ajman's GIS Base Map project. Maps Geosystems, recently taken over by Fugro, provides [photogrammetry](#), engineering surveys, GIS implementation and satellite imagery. One key product is PROMPT Image Server, acquired by ESRI in 2005, which resolves bottlenecks in conventional image-processing workflows [3].

Construction

The swaying of Burj Dubai, the world's tallest tower (the exact statistics are not disclosed) causes problems for precision surveying. According to Douglas Hayes, chief surveyor for Burj Dubai, the offset of the actual centre axis from the design axis requires continuous monitoring [4]. A solution was developed by Leica: a procedure for determining points at the top of the tower using GPS combined with a network of inclination sensors. The construction of the 75km Arabian Canal is, at US\$11 billion, one of the highest-budget projects in Dubai [5]. Since traditional survey consumes too much time and is too risky due to continuous dredging operations, the Geomatics team of constructor Limitless searched for faster and more efficient methods, and found them in terrestrial Lidar. No firm in the UAE is currently providing Lidar services, so Limitless has just purchased an aerial Lidar system and two terrestrial laser scanners.

Geocoding

The absence of a geocoded addressing system impedes location-based services such as online ordering, postal delivery and smooth transport of people and goods. Landmarks are still used as points of reference. The UAE government is considering use of a nine-digit world zipcode or name-based address system [6]. Many leading GIS companies have been contacted to provide the service.

The importance of good geo-information cannot be overestimated, as Jean-Louis Hissette, director of Maps Geosystems and with the company for more than twenty years has recalled. After a major flood caused by heavy rainfall, Dubai municipality wanted to find failures in the drainage system and requested the company to carry out a photogrammetric survey. The resulting measures safeguarded Dubai from flooding the following year, although the rains were more severe.

Concluding Remarks

New survey technologies are not as quickly adopted in UAE as in North America and Europe. To create awareness, UAE university has recently begun running geomatics courses, while the annual Map Middle East conference and exhibition, held since 2005, provides a platform for disseminating knowledge on the possibilities of geomatics technologies. As a result, one will soon be able to mention being a 'geomatics engineer' without it sounding quite such an obscure profession as it does to many people today.

Websites

[1] Sht <http://dubaitourism.com/DevelopmentProjectsInDubai/tabid/104/language/en-US/Default.aspx>

- [2] http://gisdevelopment.net/news/viewn.asp?id=GIS:N_qaimyrejud
- [3] <http://promptgeo.com/>
- [4] http://gisdevelopment.net/magazine/years/2007/april/52_1.htm
- [5] <http://zawya.com/Story.cfm/sidZAWYA20071009114123>
- [6] http://uaeinteract.com/docs/Plan_to_overhaul_address_system_in_Dubai_areas/30492.htm

<https://www.gim-international.com/content/article/geomatics-in-uae>
