# GIS Challenges and Trends



**What (business) problems are you solving with GIS (multiple answers possible)?**

- Asset management
- Business intelligence & analytics
- Compliance y & law enforcement
- Crisis management
- Decision making
- Fleet management
- Impact analysis
- Market research
- Operations & control
- Spatial planning
- Other, please indicate:

**What are the challenges to market growth for the GIS sector?**

- Location privacy
- Open data
- Open source GIS
- Efficient data management
- Market demands with respect to data accuracy and availability
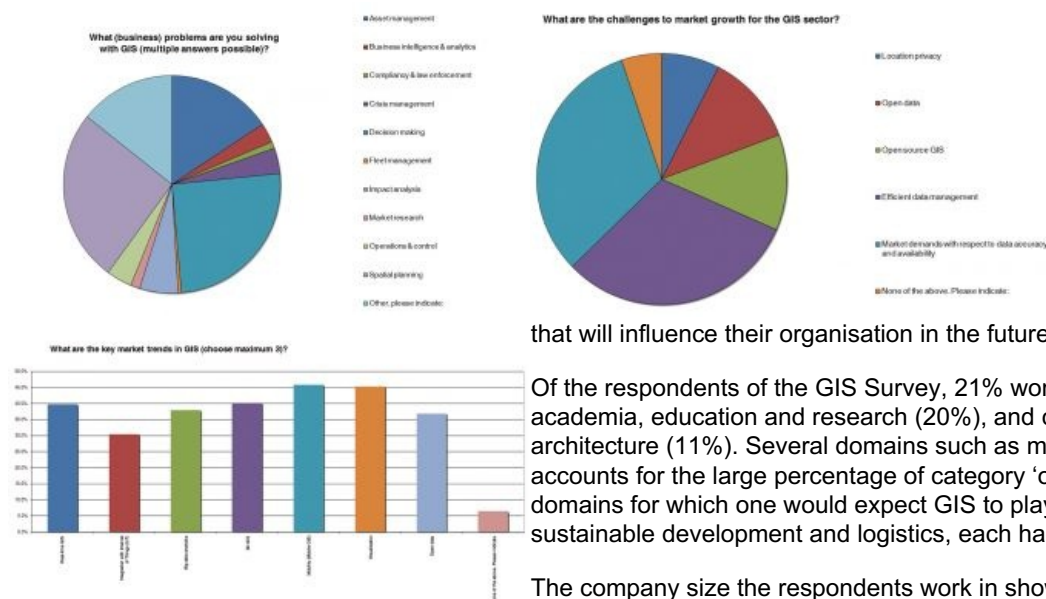- None of the above. Please indicate:

**What are the key market trends in GIS (choose maximum 3)?**

Recently, GIS Professional conducted a market and applications survey. With over 200 responses received we have gained an interesting insight into the current GIS landscape, its trends, challenges and applications. This article presents the results of the survey and shows that a large majority of the respondents is very positive about the future of GIS, which will be driven by technological advancements that will influence their organisation in the future.

Of the respondents of the GIS Survey, 21% work at the government, followed by academia, education and research (20%), and civil engineering, construction and architecture (11%). Several domains such as mining and surveying were not listed, so this accounts for the large percentage of category 'other' (19%). Interestingly, some of the domains for which one would expect GIS to play a major role, i.e. agriculture, military, sustainable development and logistics, each had less than 2% of responses.

The company size the respondents work in shows only little variation, with 19% of responses from small companies to 25% working in a large company with more than 1000 people. It suggests that GIS is widely available to anyone who sees a benefit from it.

## Market Growth

Overall, the future appears bright: 70% of respondents expect their company to grow in 2020, and 30% of responses even anticipate a growth of at least 5% in 2020. Only 8% expects a decline and 24% expects no change in 2020. From a geographical perspective, respondents consider North America as the most important growth area (28%), followed by Southern and Eastern Asia (16%), Western and Northern Europe (13%) and Africa (13%).

## Key Market Trends and Challenges

The distribution of responses for key market trends in GIS was quite even, with mobile GIS and visualisation being the most important trends. While 'open data' was selected by 37% of respondents, a number of respondents also mentioned open source applications and interoperability, which means that 'openness' as a whole is seen as a market trend. This could also explain the fact that small companies make extensive use of GIS as well, because of the accessibility of open source GIS software and the increasing availability of open data. Finally, BIM was mentioned specifically by a number of people as a key market trend.

The main challenges respondents report are market demands with respect to data accuracy (32%) and efficient data management (31%). Interestingly, open data and open source GIS were both selected by 12%, indicating that open data and open source are both seen as a trend as well as a challenge. Location privacy is seen as much less of a challenge to market growth (8%). The additional responses revealed two additional concerns: the cost of proprietary software, and the fact that the impression is that people use GIS without properly understanding it. Given the increasing availability of open source software and data it is indeed no surprise that a new group of users is emerging that see the benefits of GIS, but lack professional knowledge. In other words, GIS is getting more mainstream than ever before. Professional GIS software suppliers will have to face the challenge of selling their high-quality software to this new user group, as well as to companies that see free alternatives as a way to reduce costs.

## Importance of GIS to Organisations

Out of all respondents, 87% think that GIS is important to very important for their businesses, meaning that GIS plays a major role in their business processes. As little as 2% of respondents indicate that GIS is only a 'nice to have'. Some bias should be considered here, as we expect the readers of this magazine to already be aware of the many applications for GIS in many different domains and how to use it.

Interestingly, 30% of the respondents indicated that just 0-5% of people in the organisation use GIS. When combined with the analysis that 87% of the respondents state that GIS is very important for primary or secondary business processes, this means that a significant number of organisations rely on just a few employees for their operations. One could ask the question whether this is because of the cost that some people have indicated as a challenge that limits market growth? On the other part of the spectrum, 20% of people work in a GIS-heavy organisation where more than 50% of the employees use GIS on a regular basis.

## Platforms and Standards

61% of respondents use open source GIS in combination with proprietary GIS. A wide range of platforms, software packages and libraries have been mentioned in the GIS survey, however, ArcGIS and QGIS were most popular. They are followed in the list by MapInfo, GeoMedia, GeoServer, FME and OpenLayers. A few respondents are using other products like gvSIG and Google Earth.

The most popular GIS standards are KML (62% finds this useful) and WMS (52%). Other useful standards are the ISO metadata standards (44%), GML (35%), and WFS (41%). An answer that was clearly missing was Esri's shapefile, which is apparently seen as *de facto* standard by several respondents. GeoJSON is considered to be a useful standard as well.

## Applications of GIS

When asked which business problems are solved by GIS (and after correcting for the manually entered multiple answers due to a minor error in the survey), three business problems clearly emerge as main applications for GIS: spatial planning (31%), decision making (30%) and asset management (23%). Compliancy & law enforcement and fleet management (both 2%) are the least used applications for GIS by our group of respondents.

## Future Developments

With the integration of BIM and GIS being a hot topic at the moment, GIS Professional asked readers about the relevance of BIM to their work and their expectations of future BIM-GIS integration. 30% of all respondents indicate that BIM is relevant to their work. With respect to BIM-GIS integration, expectations vary, but standards such as CityGML are mentioned as important drivers for successful integration of both worlds. Some consider BIM as being a 'specialised GIS', while others believe that BIM will help the future development of 3D GIS in terms of modelling and visualisation.

BIM is definitely not the only trend in the GIS world. Readers consider cloud technology, open data and software, high-resolution (satellite) imagery and remote sensing, the Internet of Things (IoT) and UAVs as the main drivers for the GIS industry.

Finally, bringing everything down to an organisational level, respondents were asked which technological advancements they expect to become key to their organisation in the near future. We received a variety of answers, but cloud technology, real-time data, IoT, 3D GIS, mobile GIS and UAVs clearly stand out from the crowd. Our readers thus show that many of the new technological advancements will become important for their organisation in the future.

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