

# The AGI Foresight Study - The UK Geospatial Industry in 2015

## An Expert Paper



### GI Standards to 2015

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#### Introduction

The remit of this paper is to consider the changes that the author anticipates will happen in the geospatial industry over the next five years from a GI Standards perspective.

#### Background to Standards

The term 'standard' is often misused, especially by politicians who confuse it with 'quality'. A standard is defined as a:

"document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context".

There are several key aspects of this definition. A standard must be:

- a document - although this does not have to be paper, but may be electronic;
- established by consensus – they cannot be imposed;
- approved by a recognise body - thus there can be industry bodies as well as formal standards bodies;
- for common and repeated use - standards are not for a single implementation, but for multiple implementations by many users;
- about activities or results - it is about actual or potential problems;
- aimed at the achievement of the optimum degree of order - they are the target, rather than what necessarily happens in practice.

Standards may be specifications, methods, guides, vocabularies or codes of practice.

The main formal standards bodies are ISO (International Standards Organisation), CEN (European Standards Committee) and BSI (British Standards Institution). These all have a long formal process for standards creation, involving several rounds of public consultation. The resulting Standards often are cited in legislation (especially British Standards in the UK, or European Standards in European procurements).

There are also a host of government sector organisations, such as the e-Government Standards Board. The most relevant GI industry standards organisation is the Open Geo-spatial Consortium (OGC). This is a voluntary group of suppliers, who produce common specifications, mainly relating to interfaces. Many

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OGC Technical Specifications subsequently become International Standards, usually after they have matured and are in widespread use.

### **Current position**

There are committees dealing specifically with GI within ISO, CEN and BSI.

The ISO committee (ISO/TC 211) mainly produces generic standards covering data management (definitions, data structures, spatial referencing, quality, metadata etc) and transfer and display (GML, Web Map Server, etc). These are mainly for use by systems developers and other standards makers. Over the past five years, much of the original basic work has been completed, and ISO/TC 211 is moving into maintenance of existing standards. The main new areas of interest are Digital Rights Management, Cultural and Linguistic Adaptability and aspects arising from Web developments. The committee is also starting to get into some applications areas (e.g. land administration) where there is no other appropriate body.

The CEN committee for GI (CEN/TC 287) is tasked with making these ISO Standards more applicable within European initiatives such as INSPIRE. There has been little produced by this committee in recent years.

British Standards are usually designed for specific user communities, and are aimed at those creating and maintaining data (e.g. for gazetteers). BS 7666 Spatial datasets for geographical referencing provides specifications for gazetteers of a range of geographic objects. It is widely applied in local government and forms the basis of the National Street Gazetteer (NSG) and the National Land and Property Gazetteer (NLPG).

OGC are producing Technical Specifications aimed at interoperability of systems, mainly for use by systems suppliers.

### **Anticipated changes over the next five years**

We are now seeing GI becoming part of the mainstream information systems and technology arena. This is also true for standards, and many of the standards being developed are extensions of standards from other areas. Because of the new developments in technology and the increased need for interoperability of data and systems, there will still be a need for standards development, but this will become less specific to GI. It is more likely that it will involve extensions of existing Information Systems standards to cope with the specificities of GI. This will be extended from basic specifications into methods, implementation guides, vocabularies and codes of practice specifically aimed at the GI community.

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There will be a requirement for registries, online repositories of items relating to GI, with free access (at the point of use) possibly subject to licensing arrangements. These registries will contain the basic widely used sources of base information, and become the standards. Likely registries are:

- Codes and parameters
  - defining coordinate systems – to enable transformation,
  - country and area codes (including sea);
  
- Gazetteers – definitive lists for core reference geographies:
  - administrative units (authorities, voting, census),
  - places (towns),
  - streets,
  - occupied buildings (addresses),
  - land parcels (ownership);
  
- Terminology (multi-lingual);
  
- Classification schemes, for example for
  - Topic categories (thesaurus),
  - land cover;
  
- Transfer schemas (including metadata elements) – snippets of code so that implementers can build schemas to meet their particular requirements.

There will need to be a sustainable funding mechanism and a formal mechanism for maintenance necessitating registration authorities. There is possibly a role here for AGI, or another independent not-for-profit body.

### **Impact of change upon the geospatial industry and upon customers**

With the increasing ubiquity of GI, the geospatial industry is likely to become less “special” and less distinct. The emphasis will move towards location and spatial analysis as part of mainstream information systems activities. Increased interoperability will provide greater scope for small suppliers to specialise in particular valued added products and services, through plug-in additions via standardised interfaces to wider systems.

The industry changes will lead to greater transparency of technology for users, enabling them to concentrate on applications and usage rather than capture and storage.

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Governance structures will change. It is likely that bodies will be created for specific tasks, such as the location strategy, with a limited lifespan, and then disband or reform for another task. Members of these bodies are likely to be self-selecting, as a result of their involvement, rather than being formally appointed representatives. This will require an “overview” body, possibly in the voluntary sector, to consider strategy.

### Scenarios

Three generalised scenarios will be discussed here. In reality there will be many shades between them.

#### *i) Centrally-imposed spatial data infrastructures (SDI).*

Currently, there is a drive to create global, national and sub-national spatial data infrastructures. There has been a lot of work done, much of it of an academic nature, on what a spatial data infrastructure is and what one will look like when implemented. INSPIRE is attempting to establish an SDI, by way of a set of national SDIs in European Member States, following common principals and technology architectures. This is being implemented by a set of Implementing Rules (IR) and Technical Guidance documents. Some of these IR are very specific, and include data specifications and rules for establishing network services. If implemented successfully, this will create an interoperable GI world, where data is readily accessed and understood. The risks associated with this approach are the lack of funding for implementation, and the danger of over-specification of the method of implementation (rather than the objective) so that innovation is inhibited and obsolete technology is enshrined in the infrastructure. This may well lead to two parallel communities – the public sector information community and the faster moving internet free-spirits in the commercial sector.

#### *ii) A free-market with no central direction.*

In this scenario, any attempt at a government-led initiative to impose a spatial data infrastructure is abandoned to the “free-market” and commercial interests. Discovery services are provided by data suppliers and commercial services driven by advertising and sponsorship. Public sector data continues to be largely inaccessible to the wider user community (including the rest of the public sector) and even when accessible, is not suitably understood by potential users. In this scenario, there will be rapid expansion of (commercial) services in the short-term, but lack of interoperability will lead to segmented communities “doing their own thing”, and long-term stagnation in the public sector.

#### *iii) An enlightened community with an underlying spatial data infrastructure*

In this scenario, there is a spatial data infrastructure (hopefully not called that), with the means of discovering, accessing, integrating and using data. This requires common standards being adopted for data identification (standard objects), definition (description languages), referencing (schemes) and access (transfer schemas), generally transparent to the user. No attempt is made to impose a single

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world-view or to limit services. Barriers to access and use (restrictive licensing, lack of core information) are broken down. Core reference geographies are made available (essentially free) via centrally maintained and controlled gazetteers of definitive data.

### Summary of 5 key points

1. GI is becoming ubiquitous, with “place” becoming part of mainstream information systems. GI Standards will follow this move from being specific to GI into extensions of wider standards for general IT and application areas.
2. The emphasis will move to best practice guidance (how to) rather than detailed specification of what needs to be done.
3. Standards themselves will move from being (abstract) specifications to definitive registries of items – gazetteers, code lists etc, for example of core reference geographies. There will be on-line access to all resources, rather than formal documents, designed for printing on paper.
4. Processes for agreeing standards will become more streamlined, so that they become adopted more quickly and are able to represent the current state-of-the-art rather than the previous generation.
5. The emphasis will change from syntax (form) to semantics (meaning). Areas such as cultural and linguistic adaptability will become more important rather than basic technology, in line with other Web 2.0 developments.

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