

# Staying relevant in a digital era?

## Developing Information Systems to meet society's needs

by Ian Jackson, *Keyworth*

Like most other geological surveys, the BGS is a public sector research organisation with a mission to acquire, analyse, manage and disseminate geoscience information and knowledge, in order to contribute to the quality of life and economy of its host country. When the BGS was founded, in 1835, the factors driving geological surveys were scientific understanding and frontier exploration. These objectives have evolved over the years, through resource assessment and economic development, to the present-day concentration on environmental issues and societal benefit. In response, most

national geological surveys have changed the focus of their activities — from primary mapping, through resurveys, to thematic mapping — and several are now embracing client-driven research and the improved management and dissemination of their unique knowledge bases. In the past 20 years two other significant factors have appeared: declining budget allocations from governments and the IT revolution. This is the context in which geological surveys now have to operate. The world at the beginning of the twenty-first century presents both opportunity and threat, but it would be foolish for any geological survey to

assume that their current *modus operandi* will continue unchanged.

Despite most surveys having more than a hundred years of public service behind them, the relevance of geology to managing resources and hazards is still not widely understood outside the geoscience profession. Too many of today's decision-makers and fund-holders — the politicians and the businessmen — are unaware of the critical role geological factors can play in disaster mitigation and planning, environmental protection, and sustainable resource development. Perhaps more regrettable is the general ignorance of the comprehensive and unique information and knowledge bases that exist, under-exploited, within each national survey.

So who is to blame for this lack of awareness? Those of us who claim to embrace the client-focus ethic must also be prepared to accept the dictum that 'the customer is always right'! So we (the geological surveys) have to accept responsibility on two counts. First, decision-makers do not know about us because we do not inform them effectively. Second, too often we fail to address the customers' real needs. There is little or no meaningful dialogue to establish their requirements and a tendency to offer what we think they should have, frequently coupled with an ongoing concentration on traditional 'academic' output. The latter, while essential and comprehensible to fellow



Since their inception, national geological surveys have changed the focus of their activities to meet society's changing needs.

geoscientists, generally leaves the end-user impressed by the elegant colour scheme but otherwise uninformed. To stay relevant, surveys have to address these issues.

The necessity for a strong foundation of high-quality geoscience research and information is not in doubt. But there is an urgent need to reassess the traditional focus on complex 'academic' output, and to build products that genuinely meet society's requirements. These products need to be expressed and provided in a way that is meaningful to a non-geoscientific user. To do this successfully, we must understand more fully what the customer needs; a difficult task requiring time-consuming dialogue and listening, perhaps in one-to-one interviews or market sector forums. 'Public Understanding of Science' programmes might be better replaced by 'Scientists Understanding the Public'! If we can tease out the requirements, we have never been better equipped to be able to meet them. The availability of inexpensive, powerful and sophisticated IT tools equips all surveys with the facility to provide customised and flexible products based on our unique geoscience knowledge bases. In common with many other geological surveys, the BGS is attempting to exploit this opportunity.

In November 1999 the BGS launched a new corporate strategy. This confirmed that the balance of its programmes would change from systematic survey, data collection and internally driven research to the management, dissemination and application of knowledge to meet the needs of its clients. To achieve this a number of major internal and external information initiatives are in train. The sections below describe some of the initiatives the BGS is taking.

### Geoscience Integrated Database System

This programme is now entering its third and final year. Its overall aim is to introduce a coherent approach to database policy and practice in the BGS. Sub-projects within the Geoscience Integrated Database System (geo-IDS) are: defining and implementing corporate data management policy; a logical data model; metadatabase; data and application software standards; common geological and cultural datasets; and access to the data using

Geographical Information Systems (GIS) delivered via the BGS Intranet. This project is described in more detail on pages 12–13.

### DigMap

This project has already completed the vector digitisation and attribution of all 1:250 000 scale geological maps of the UK. It will complete vector digitisation and basic attribution of about 95% of the 1:50 000 scale sheets of Great Britain (534 in all) in 2001, and extend to more detailed 1:10 000 digital cover for urban areas. A large part of the digitisation is being undertaken outside the BGS under contract. A fuller description is given on pages 8–9.

### Digital Geological Spatial Model

In reality this is more than a programme; the Digital Geological Spatial Model (DGSM) marks a whole new philosophy for the BGS in terms of how it will acquire, organise and describe its data. Work has just concluded to define the programme. It is seen as having two elements: DGSM-Framework, which will construct the three- and four-dimension architecture, standards, software applications and procedures; and DGSM-UK, the population of the framework. This will not just use specific DGSM funds (an additional £4.5 million over five years) but also incorporate all other BGS work in the UK, which will be expected to feed in data to the framework and thus gradually build up the model. It is envisaged that the DGSM will comprise consistent two- and three-dimensional structural models, geochemical models, hydrogeological models, etc. This project was described in detail in issue 15 of *Earthwise*.

### Digital Report Generating System

This project is investigating a way of unlocking the huge knowledge resource within text documents, information which is notoriously difficult to store and retrieve in a structured and flexible way. The aim is to allow geoscientific reports to be generated semi-automatically to meet specific requirements. It is based on Standard Generalised Mark-up Language, designed for structuring complex technical documents. Segments of text, along with their associated diagrams, pictures, tables and references, can be linked through a GIS, or potentially a 3D model, to spatial entities and thus scale. In

this way, information on a specific geographical area or geoscientific theme may be retrieved by report-generating software applications. As well as allowing customers to specify the scope of reports, it also allows efficient reuse of text so that, for example, a particular outcrop description is written only once. This will lead to greater consistency in the style and content of reports and is consistent with the move to interactive dissemination of information via the World Wide Web. In the work done to date on the Digital Report Generating System (DRGS) the starting point has been existing reports, which have been marked up by geologists. However, to obtain the maximum benefit of using this hypertext system, in the future text will be written specifically for it. See page 32 for more details.

### The Internet

A major and overarching element of the new BGS strategy is to accelerate the switch of focus and resources away from output based on conventional media, to Internet delivery of data, information and knowledge. The BGS's products and services will be available, either for free on its existing web-site: [www.bgs.ac.uk](http://www.bgs.ac.uk) (particularly research reports, 'internal' standards and dictionaries) or, for a price, on its e-commerce site: [www.british-geological-survey.co.uk](http://www.british-geological-survey.co.uk), launched in April 2000 (see page 27). Site-specific report and information delivery, and the flexible provision of digital data will follow the first stage of selling the conventional product range on-line. A number of web-based initiatives are described in full on pages 26–34.

In summary, the future success of the BGS and other national surveys is likely to depend as much on how we manage and disseminate our current knowledge as on how we acquire more. Understanding users' (society's) needs and exploiting IT to meet those needs will be critical. These are challenges facing all geological surveys and we must share our experience of the problems, as well as continue to pool our expertise to find solutions.

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