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Information Management as an enabler: a case study from Medway Council

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Abstract

Information management is a key enabler for the sharing of information within authorities and with partners and is fundamental to e-government. A prerequisite for the development of an information strategy is to determine the information asset and the information flow within the council and with partner organisations by means of an information audit.

This paper describes such an information audit implemented by Medway Council in 2002/03. The key findings of the audit were that:

1. Information sources held by the Council were fragmented and that much of it was held in information silos

2. There was inadequate coordination of corporate information

3. Most Council officers were exposed to too much unfiltered information (especially via e-mail) and this led to Information overload

4. The information officers had access to was of variable quality

5. Inconsistent handing of geographical and personal data

6. Poor metadata, making it difficult to coordinate and manage information assets

7. The enormous breadth and depth of information held by the local authority

8. The importance of managing information as a resource

9. The importance of developing an information-sharing culture

10. The importance of resourcing data capture and maintenance, not just hardware and software

11. The importance of sharing information with partners

During the information audit, property and place was identified as a key category. The survey revealed that 75% of electronic and 60% of paper repositories did contain an address or other geographic reference. Improving information management as a result of the audit will be exemplified using geographic information. Reference will be made to the storage of GI in file systems and the improvement to information management when stored in a central database structure (OS mastermap). This will eventually allow the full integration of GI into other systems including: electronic document and records management (EDRM) and customer relationship management (CRM) systems. Capturing and maintaining a consistent set of metadata for the repositories and adherence to the e-Government Interoperability Framework (eGIF) are seen as enabling strategies for effective management of information resources and systems.

1 Introduction

Although Information is recognised as one of the most valuable assets of local authorities, information management is often one of the most neglected areas (SOCITM, 2001). Good information management is key to providing accurate and up-to-date information to the end user and is an important enabler for electronic service delivery (Haynes, Rees–Jones and Field, 2002).

In local authorities many of the processes for handling information are still paper-based and one of the consequences is that information is locked up in departmental silos. Information tends to be collected for one purpose only, and not shared across departments. As a result, the same data may be gathered and held in multiple versions in different departments. A good example of this is address information. In a recent information audit 140 address gazetteers were identified in Medway Council alone.

There are signs that information sharing and management is improving and awareness is rising. The Intra-government Group on Geographic Information (IGGI, 2000) and the Society of Information Technology Management (SOCITM 2001) have published detailed guidelines on how to improve information management. Best practice examples show that Information is shared between different organisations within the same sectors (for example to tackle crime and disorder (see papers in these proceedings)). For instance in Essex, information management has become centrally coordinated in the Centre for Information and Knowledge Management (IKM) which greatly improved access to corporate IKM resources and facilitates joining up of geographic information (Wood, 2002).

The SOCITM guide on investing in information (SOCITM, 2001) identified the main tasks in changing practices to improve information management as follows:

- Review organisational information management functions

- Develop principles for information management

- Carry out an information audit and identify information needs

- Implement information standards

- Develop an information security policy

- Implement and integrate a records management policy

- Develop an information skills programme

One of the main steps to develop an information management strategy is to compile an inventory of information repositories the organisation holds and to review its information needs. This can be mapped against information requirements and forms the basis of an information audit. This paper will report on:

- the findings of an information audit carried out in Medway Council

- the resulting recommendations to improve information management and the evaluation for implementation

- a case study showing how the result of the audit and the request for sharing information in e-government is changing practices of geographic information management at Medway.

Medway is a unitary authority in North Kent, with a population of 250,000 (Census 2001). Medway's area is half rural and half urban consisting of the Medway towns of Strood, Rochester, Chatham, Gillingham and Rainham.

2 Information audit

Information audits have been around since the mid 1980s when pioneering work was conducted in the United States to develop a method of information mapping (Burke and Horton, 1988) to analyse information requirements and resources within organisations. Current thinking (Henczel, 2001) on information audits is based on the concept of compiling an inventory of information resources (these may be repositories such as

databases and document collections or services), consulting users about their work-related information needs and matching the two together. In a complex environment such as a local authority there will be a wide range of business units that make use of information and share information among them. For example in Medway there are 80 service managers in 5 directorates

The information audit in Medway was carried out in the winter of 2002/2003 and consisted of two main operations: the development of an information inventory; and a review of information needs (see above main tasks for improving information management as identified by SOCITM). The analysis of the match between requirements helped to identify the gaps in provision, areas of duplication and redundant information sources and is intended to feed into the Council's development of the high-level information management strategy. The diagram below illustrates this process.
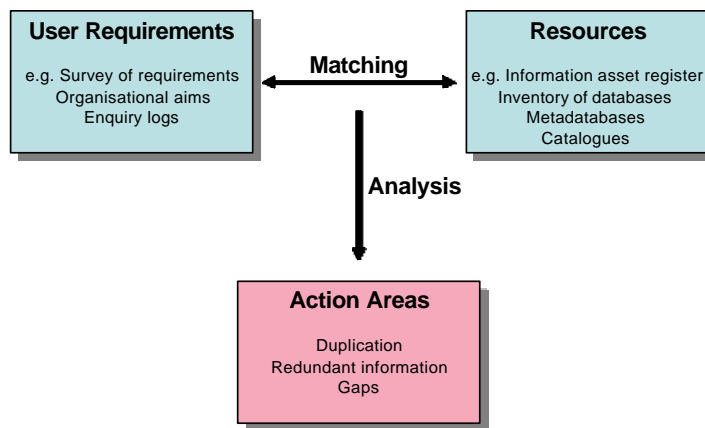
Audit process

Figure1: Diagram of audit process

2.1 Inventory of information assets

Interviews with senior staff in each of the directorates allowed the project team to develop a view of the main operational activities of the Council and the major information resources that are managed by each directorate. The identification of information assets formed the basis for a meta database to capture details of each of the repositories of information surveyed. The metadata used was based on the e-Government Metadata Standard (eGMS) with additional elements such as geographic reference, which identifies whether the repository held a reference such as an address or a street.

2.2 Information needs and flows

A major part of the work was to identify information needs and to map information flows. Information flow maps were developed on the basis of the key exchanges of information within each directorate.

2.3 Analysis and issues

A series of workshops with operational staff were conducted to identify information issues and prioritise their concerns. Of particular concern were areas where information needs were not met adequately.

3 Major findings

The audit revealed some key issues that need to be addressed as part of the information management strategy. These issues inhibit the effective sharing of information within the Council and prevent joined up delivery of services to the community. They are:

1. Information sources held by the Council were fragmented and that much of it was held in information silos

2. There was inadequate coordination of corporate information

3. Most Council officers were exposed to too much unfiltered information (especially via e-mail) and this led to Information overload

4. The information officers had access to was of variable quality

5. Inconsistent handing of geographical and personal data

6. Poor metadata, making it difficult to coordinate and manage information assets

Other points emerging from the discussions with service heads and workshops with information managers were as follows:

7. The enormous breadth and depth of information held by the local authority

8. The importance of managing information as a resource

9. The importance of developing an information-sharing culture

10. The importance of resourcing data capture and maintenance, not just hardware and software

11. The importance of sharing information with partners

4 Information repositories

The survey revealed over 300 information repositories that contained operational information used by the Council, of which only 100 or so are centrally managed by the ICT department. Although 180 of these repositories were based on database technology, there were a significant number of paper file collections, shared-drive directories, CD-ROMs and web-based data. Some key data elements such as personal information and geographic information cut across many of the information repositories and provide an avenue for consolidating different resources.

4.1 Information Classification

There are clearly many potential ways of classifying the information held by a local authority. We found it useful to distinguish between the following categories:

• Information about people

• Information about property and places

• Complaints

• Other operational information

• Management information

• Research and profiling information

• External repositories

• Document capture

4.2 Geographic Information

It is often claimed that roughly 80% of information held by a local authority carries some form of geographic reference, such as an address. The development of the asset list for Medway Council provided a useful opportunity to establish the truth of this claim. Of the 180 database repositories, 121 had some and 11 a possible geographic reference, i.e. around 75% in all. Of the other repositories, 77 or just fewer than 60% had some geographic reference. Whilst not fully supporting the claim, therefore, this study does indicate a

high degree of geographic content. By consolidating these datasets, there is clearly scope for far greater use of GIS within the Council

4.3 External Repositories

A small number of external repositories holding Medway data were identified. These included data held:

- by contractors (complaints information on street cleaning and refuse collection)
- on a national service (tourist information and trading standards)
- on the Government's national childcarelink database (Childcare provision information)

As the trend to 'joined up' working of the public sector continues, it is likely there will be more opportunities to provide cross-organisational information relating to specific themes.

5 Information management issues

It is perhaps not surprising that one of the most important findings of the information audit was that the Council's information (and systems) is fragmented, and the "big picture" presents itself as a chequer-board of largely independent information silos or islands. Information is overwhelmingly organised in systems and hardcopy collections to support the specific business activities of a service unit or department. Organising information collections around operational needs may be entirely appropriate, however when replicated throughout the Council's 80 or so service units it is the origin of many other problems including:

- Duplication of information
- Technical incompatibility
- Inconsistency
- Lack of direct access to information
- Incompleteness

The audit identified, however, major multi-functional information repositories, most notably associated with health & community activities. In principle such repositories have the greatest capacity for producing new management information, eliminating integrity issues, and reducing duplication of maintenance effort.

A common concern was the difficulty staff had in finding relevant information and the problems of compiling data from disparate sources. For instance the Neighbourhood Renewal Section had difficulty pulling together statistical information. Getting hold of information below ward level to support the neighbourhood renewal audit was difficult. More generally, research findings were often dispersed across silos, making it difficult to know who to talk to or where to go. Many of the operational procedures for individual sections included paper handling and document management. The procedures were inconsistent and in some instances contributed to problems in other areas. Hence, there is a need for information to be properly indexed and referenced so that people can find it quickly and easily.

There were wide ranging attitudes towards information management and sharing within the Council and with local, regional and national bodies which depended greatly on the nature of the information involved and the purpose for which it was being employed. The tension between confidentiality and need to share person related information was not surprisingly an area of particular concern.

While many people recognised the importance of good information management, they felt that this could only be achieved by dedicating specific resources to the development and implementation of an information management strategy. There was a strong feeling that lack of adequate resources would inhibit the successful development and implementation of a new information strategy. Concerns were expressed in a number of areas about the lack of resources to capture and maintain information, particularly in electronic form. As one manager commented:

"Too often we find the money to purchase a system without identifying the resources to capture and maintain the information it records. As a result we fail to realise the benefits it could bring."

Like all local authorities, Medway Council deals with a wide range of organisations, many of which are partners in areas of overlapping responsibility and operation. Whilst some of these are well known, such as schools, Primary Health Care trusts, and Regional Police Forces, the range of organisations involved was far wider than was realised at senior level, and included: contractors in areas such as housing, care, all highways activities and voluntary organisations providing social and disability related services. Some of the Council's greatest information management opportunities may lie in providing effective communication with these third parties.

6 Recommendations and their implementation

The audit proposed a number of measures to improve information management which were evaluated by the authority for implementation:

	Recommendation	Response and Progress
1	To commit to managing information across the authority including responsibility for implementing information handling policies by establishing an information management post	Although senior management supports the necessity to resource information management, the authority has so far failed to gain political support for a corporate information management post. However, funding may become available via the Kent wide portal initiative to address common issues of information management across all LAs in Kent.
2	To adhere to the interoperability framework as part of procurement approval and systems development	Implemented; all newly procured systems have to follow standard
3	To allocate the website and intranet to an existing member of staff	The corporate webteam has overall responsibility for content and management of web pages via the content management system. Responsibilities for individual pages are devolved down to directorates.
4	To develop procedure for maintaining the meta database of information repositories	Project in progress to develop a meta database accessible on the intranet which lists all information repositories in the organisation and is linked to FOI publication schema published on the internet.
5	To organise geographical information which forms part of the GI database infrastructure project	Implementation of GI database linked to meta database is in progress
6	To identify information clusters of core data sets to provide a basis for developing the Council's information management strategy.	Mapping out workflows to identify patterns of information sharing and core information clusters. Only carried out in one directorate but resource restrictions brought project to a hold.
7	To introduce information handling and management as a part of staff induction and council-wide awareness raising and training through Learning and Development. This would include the review and re-introduction of an e-mail policy.	Started development but lack of resource for someone to take corporate responsibility for developing and coordinating the content of a programme
8	To implement a records and document management system as a medium term solution to introduce good practice for keeping, sharing and managing electronic information and paper records in the Council.	Medium term solution. Systems are not widely enough adopted hence costs are too high.

7 Management of geographic information

Geographic information is one of the key data repositories in local government shared amongst a range of users across the authority. As GIS is a data integrator, Medway realised early on that information management is a prerequisite for providing up-to-date geographic information to the user. In 1998, Medway approved a GIS strategy. One of the most important outcomes was the central management of geographic information and the distribution of geographic information via an intranet (Schmid & Hodge, 2001) and the Internet (www.medway.gov.uk/maps).

The management of geographic information in Medway broadly follows the data management guidelines proposed by IGGI (2000). Geographic information is currently stored on a central server which can be accessed by all networked computers within the organisation. Specific GI applications are distributed via the GIS intranet (GISMO) to all PCs and via the Medway map service to the citizens (www.medway.gov.uk/maps). All geographic information is recorded in a meta database following NGDF guidelines. The GIS section has the overall custodianship of the GI library and controls the quality and uploading of GI to the central server in parallel with updating the meta database. Individual service areas have ownership of geographic information.

Recent technological advances make it possible to introduce new information management practices and thereby address a shortcoming in this area. Specific areas that need to be addressed are as follows:

The file-based structure does not adhere to interoperability guidelines as the data can only be accessed in the inherent GIS format by standalone GIS licences and not shared amongst different platforms. This hinders an open systems approach.

OS mastermap and Positional Accuracy Improvement (PAI) provided additional challenges of information management to the authority, as the volume of OS mastermap data can be best stored, indexed, updated and managed via a database. PAI provides the extra challenge that not only one topographic map layer per area needs to be stored and managed but two to allow referencing to a pre and post layer. This is necessary as the over 200 map layers in the authority can only be gradually updated.

The lack of an information management culture has resulted in data being downloaded from the central servers and stored and updated on individual team drives. This means that the central meta database and central repositories do not represent current geographic information held by the Council

Initial lack of standardization of geographic data models hindered the distribution of the information via GISMO which requires standardized table structures.

To address the above issues, Medway has committed resources to develop a GI database in Oracle 9i to store and manage all its geographic information including OS mastermap data in the locator database. There is also a plan to move all geographic information layers that are shared by various applications into the database and to develop a standardized table structure for geographic information. This in turn will require a more detailed audit of all geographic information to discover recent updates and repositories of information. The existing meta database and the information audit will be of great help to locate that information. Controlled access permissions within the database will hopefully allow direct updating of information by the various owners. Any updates will directly trigger an update in the meta database.

It is hoped that the ability in the future to link other workflow and asset management systems directly into the database will improve information sharing amongst a wider range of systems. However, without enforcing strict information management policies council-wide and a willingness and culture shift to improve information management, the information repositories and associated metadata will be quickly out of sync again.

8 Conclusion

The information audit and resulting recommendations provided a clear working programme for implementing information management council-wide in the authority. Although senior management support the need to resource information management, the authority has failed to convince the political leadership to provide the necessary resources to commit to an information or knowledge manager that

could centrally coordinate many of the information repositories and policies. Unfortunately, in the current e-government climate, funding is project based. Information management is mainly a revenue function. Benefits by improving information management can seldom be quantified directly at the source of the responsible information custodian. As a result of data sharing, the benefits may be identified in a different location in the organisational structure than where the information is captured, maintained or managed. Hence, it is vital to further lobby the link between good information management, good customer services and electronic service delivery.

9 Acknowledgement

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