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Spatially-enabled CRM at London Borough of Havering

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Abstract

The London Borough of Havering is using a spatially-enabled Customer Relationship Management (CRM) solution to improve the efficiency and responsiveness of street maintenance operations. This solution showcases the application of geographic information (GI) to provide a common framework, data sharing and improved decision making to deliver real business benefits. The systems integration is achieved using java components within an all Oracle technology stack comprised of Oracle e-Business Suite 11i CRM TeleService, Oracle9i Locator, Oracle 9iAS MapViewer and Oracle's J2EE environment, OC4J.

This paper describes the business objectives, technical solution and key success factors of the Spatial CRM Integration project at the London Borough of Havering. The implementation approach, via partnership with the private sector, is highlighted and the business benefits delivered by the solution are discussed.

Introduction

Havering is the second largest London Borough. To the north and east the Borough is bordered by the Essex countryside, to the south by a three mile River Thames frontage, and to the west by the neighbouring Boroughs of Redbridge and Barking and Dagenham. The Council serves a population of 230,900 of which 20 per cent is retired. The Borough has 7,000 businesses employing over 60,000 people and unemployment is low at about 3 per cent. There is a thriving local economy with Romford at its centre, with good shopping facilities and a vibrant evening entertainment trade.

Havering Council employs just fewer than 8,000 staff and had a budget in 2002/2003 of £209.5 million. Since May 2002 the Council has been led by a minority Conservative administration. The Council's vision is:

"Putting people first by creating the best opportunities, the best environment and the best public services that we can for everyone who lives, works or visits here."

For the Council, Putting People First means creating an environment in which people are proud to live; where local amenities are well maintained and the community feels safe; where people are well educated and motivated and the local economy is thriving.

To support the many initiatives underway, the Council has a parallel programme to regenerate its technical infrastructure and has adopted Oracle as its enterprise database. In 2002, the Council implemented Oracle's CRM Teleservice complete with the Citizen Interaction Centre (CIC). This application is used in the Call Centre. Members of the public telephone for information about the Council's services or to report a problem. The Call Centre operator responds to the call using information and tools provided by the CIC. If appropriate, the operator will create a Service Request, details of which are routed to the appropriate team for resolution. The Service Request is updated with status information during the resolution process.

In 2003, the CIC was integrated with an Oracle9i Locator database via 9iAS MapViewer to provide GIS functionality to the Call Centre.

Business Objectives

Following extensive public consultation, Havering has identified the following priorities for the next three years.

1. To promote financial efficiency and value for money;
2. To improve the quality of its services, focussing on social care, housing, culture and streetcare services;
3. To make Havering a better place in which to live and work, focussing upon improving the environment: the physical appearance and condition of the streets, parks and other public places.

Additionally, Central Government has set out its Modernisation Agenda for e-Government. The 2005 deadline for the electronic availability of all public services is fast approaching. Alongside the e-Government agenda are numerous other initiatives that the Council is required to support, such as the Best Value Initiative and the adoption of a National Land and Property Gazetteer (NLPG). Best Value requires local authorities to deliver services to clear standards by the most economic, efficient and effective means available. The NLPG will lead to a national address database and provide the foundation for economic development at both a national and local level.

The Council is in the process of using the new opportunities provided by the latest information technology and the e-Government agenda to improve its customer services. For this reason it has been working with Oracle to implement Oracle CRM to support its telephone, face to face and web services. Using Oracle Consulting's "LG45" template, Phase 1 of the CRM system went live in December 2002. LG45 is a rapid implementation of CRM TeleService and includes extensions and data loaders specifically to support local government requirements in the United Kingdom. At the same time the Council delivered the first version of its Local Land and Property Gazetteer (LLPG) to the NLPG hub. Alongside the development of management information functionality (using Oracle Discoverer) the development of spatially-enabled CRM was undertaken as part of Phase 2 of the project.

A Business Case for Spatially-enabled CRM

The ability of GI to provide a common framework, data sharing and better decision making has been identified as critical to improving efficiency and responsiveness in the delivery of public services.

The CRM TeleService implementation goes a long way in meeting many of Havering's business objectives, but a study of user requirements clearly indicated a requirement for integrated GI to provide significant benefits. A business case was developed, including the following requirements:

> **Business Requirements**
> - Deliver operational efficiencies:
>   - Eliminate duplicate Service Requests at creation;
>   - Pin-point the exact location of the Service Request;
>   - Make available additional information to field service engineers such as serial numbers.
>   - Reduce the number of site visits using historical Service Request information;
> - Provide more meaningful reports that show spatial relationships;
> - Improve availability, quality and currency of GI;
> - Improve data and systems integration;
> - Minimise system deployment and maintenance costs
> - Provide access to a high number of users without prohibitive licensing costs

Similar to many local authorities, Havering's GIS Strategy identifies the benefits of a central Corporate Spatial Database, with a mix of web- and thick-client GIS, which can also be integrated with the disparate applications in use within the Council. Spatially-enabling CRM provided the opportunity to deliver the first phase of this vision.

Oracle9i Locator was selected to provide the spatial data repository for the Spatial CRM Integration project.

A business case for Oracle Locator

- An 'open' repository for geospatial data;
- Industry standard for spatial data in Relational Database Management Systems;
- Robustness, reliability, scalability, availability;
- Part of the whole Oracle product family;
- Enterprise software within the London Borough of Havering.

Oracle Consulting was chosen to build the spatial database and develop an integrated spatial capability with the CRM system.

The Solution

System architecture

The high level system architecture developed for the Spatial CRM Integration project is shown in Figure 1.
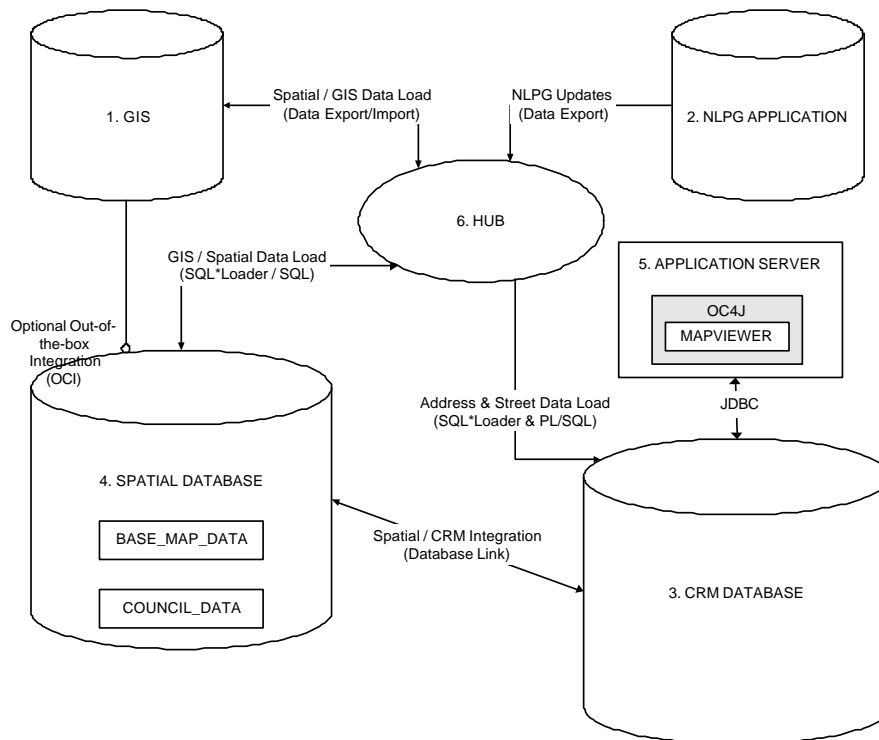

Figure 1. High level Solution Architecture

The solution requires five key components and one optional component, the integration Hub. The Hub provides enhanced integration functionality and integration to additional applications, but is not essential. Without an integration Hub the load, update and export procedures rely on manual operations.

Each component is briefly described in the table below.

1. GIS	The GIS is the 'master' repository of all geographic data; the spatially-enabled CRM uses a subset of this data. The GIS data may be stored in a proprietary file format or in a spatial database such as Oracle9*i* Locator. The major GIS vendors provide GIS fully integrated with Oracle Spatial or Locator.
	GGP Systems Ltd supplies Havering's Corporate GIS and Gazetteer software. Although GGP does not provide out-of-the box integration with Oracle Spatial, it is working to provide this functionality. Once full support for Oracle Spatial is made available, Havering will migrate its GGP files into the database. In the interim, some data is duplicated in both the spatial database and GGP. Synchronisation of point data is maintained via GGP exports to ASCII text files which are loaded into Oracle via SQL*Loader. Comma separated files can be extracted from Oracle Locator and imported into the GGP.
2. LLPG	For Havering this is a turnkey application to maintain property and street data to BS7666 format supplied by GGP. In 2002, the Council delivered the first version of its LLPG to the NLPG hub, and has been working to improve the quality of its address data.
3. CRM Database	This stores all of the Oracle e-Business Suite applications data. Property and Street data is loaded from the LLPG to provide the common address framework.
4. Spatial Database	Implemented using Oracle9*i* Locator or Spatial, two main categories of GI are maintained:
	BASE_MAP_DATA. Base mapping data is typically licensed from data providers such as Ordnance Survey. This solution uses OS MasterMap to provide the base mapping.
	COUNCIL_DATA. This is the data collected and maintained by the Local Authority.
5. Application Server Node / OC4J & MapViewer	Runs the Oracle Applications code and Application Server (9iAS). A standalone installation of OC4J is used to deploy the JSP-based MapViewer application.
	9iAS MapViewer is a simple map rendering engine that reads vector data from the database and transforms this into a GIF or PNG image that is displayed within a JSP. MapViewer was designed primarily to support the integration of spatial capability within the Oracle e-Business Suite.
6. Integration Hub (optional)	Implemented using Oracle Application Interconnect, the Hub provides the integration point for the Local Authority's disparate applications, enabling data to be shared with CRM.

Table 1. Description of the Spatial CRM Integration Technology Stack

Integration solution

The custom development required to integrate Oracle9i Locator, 9iAS MapViewer and CRM Teleservice is comprised of three major components:

- Custom 6i Form;

- Pluggable Java Component (PJC);
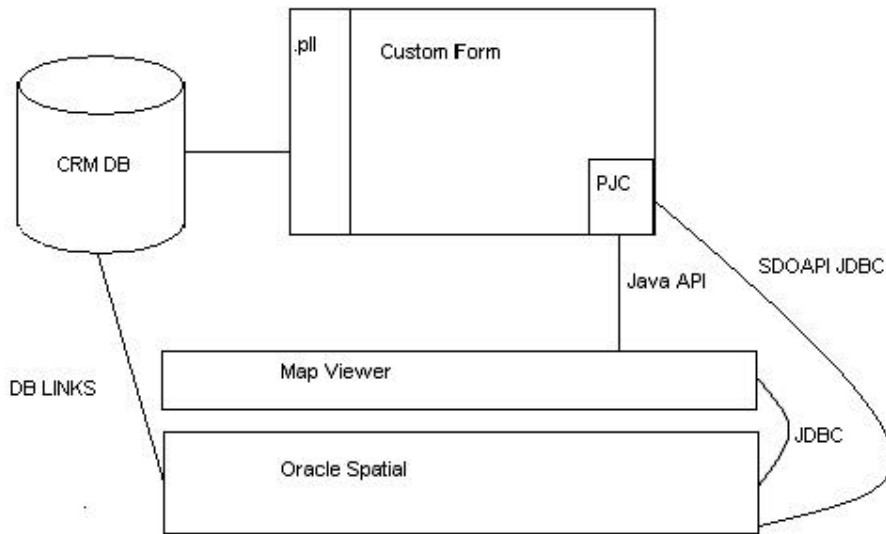
- Custom Library entries and Custom PLL's.

The Custom Form provides the user interface within CRM TeleService to the spatial database. The form runs in JInitiator as a Professional Form and was built using Oracle Forms Developer 6i. The Custom Form embeds 9iAS MapViewer to display spatial data and uses a PJC to extend MapViewer to provide interaction with the map. The Spatial Java API (SDOPAPI) was used to create spatial features.

The choice of technologies and design approach maintained the Professional Applications look and feel. Key features of the design include the use of database links and database views to join CRM data with Spatial data in real time. Application Profile Options were used to hold setup information about the installation, such as the MapViewer Service location and database port numbers. This ensures that the solution is generic and portable between installations.

This provides the following functionality:

Functionality

- Display spatial data in the Contact Centre form of the CRM Application e.g. background mapping and Council-owned data;
- Use an icon on the Contact Centre toolbar to open a map centred on the Property or Street selected in the Contact Centre form and scaled appropriately.
- Each Service Request type is a 'layer' that can be displayed over the base map. The user can choose a layer to display.
- Eliminate creation of duplicate Service Requests via visual inspection. Colour code features in the map to show if any open service requests exist in CRM for the feature.
- Select a feature from the map, display its attributes.
- Select a feature from the map, and populate Service Request fields in the Contact Centre form.
- Accurately pin-point the location of a Service Request;
- Create a point feature in the spatial database via the map interface. Associate the feature with a new Service Request, i.e. for an abandoned vehicle or skip permit.

Key Success Factors

Partnership a key to success

Partnerships with the private sector are playing a key role in delivering Havering's technical strategy. Oracle Consulting was fully engaged in the CRM Teleservice project and has worked closely with Havering to design and develop a solution to meet the business requirements of local authorities. The consulting approach saw Oracle deliver the initial solution, providing skills transfer and mentoring to enable Havering to continue to develop the system. The close working relationship between Havering and Oracle is continuing to identify functional enhancements and integration opportunities with other local authority application providers. There are also opportunities for spatially-enabling other Oracle Applications products such as Enterprise Asset Manager and Multi-Agency Service - a multi-channel front-end to TeleService for use by field agents of the Council (both employees and third-parties) and also the citizens.

Leverage CRM to increase visibility of GI

The success of the CRM TeleService project was used to leverage support and sponsorship at the highest levels within the Council for the Spatial CRM Integration project. The proven ability of spatially-enabled CRM to improve the integration and efficiency of service delivery has raised the profile of GI within the Council. This will lead to further investment in this area.

User driven

This was very much a user driven, not a technology driven, project. Havering had a very clear vision of what they wanted to achieve via the Spatial CRM Integration project. Staff prioritised the spatial data sets and agreed upon a phased implementation approach. Upon delivery of the solution, user acceptance was readily achieved because the extension built upon an existing solution, provided the same look and feel, and is intuitive to use. This has reduced the amount of user training required.

Common address geography

The single address geography provided by the LLPG is fundamental to both the CRM Teleservice solution and the Spatial CRM Integration project. The Gazetteer is the master repository of this information, and as the most current and accurate source, is used to update the property and street information in the CRM database. The spatial database is tightly integrated with CRM, in real-time, using the same address geography. The benefits of a single GI framework have been proven and all applications will be migrated to the standard LLPG base.

Data issues

Havering has lacked a consistent approach to GIS, with each department developing solutions in isolation. This has led to common problems such as duplication of data and effort as well as poor data consistency, currency and management. The Spatial CRM Integration project provided the impetus to address these issues in a pragmatic fashion and to start moving toward a common GIS Strategy. To build the spatial database, issues such as ownership, accuracy and update cycles were addressed for the key data sets. Although work remains to be done, a lot of progress has been made towards improved consistency and data sharing.

Business Benefits

Spatially-enabled CRM has proven the value of GI to achieve real business benefits. Havering's top three priorities are directly supported by this project:

1. To promote financial efficiency and value for money: Spatially-enabled CRM has resulted in immediate operational efficiencies both in the Call Centre and in the field via the reduction in duplicate Service Requests.

2. To improve the quality of its services, focussing on … streetcare services: Street cleaning and maintenance, street lighting and highway maintenance Service Requests are resolved more rapidly because Service Requests are located more accurately and the number of site visits is reduced.

3. To make Havering a better place in which to live and work, focussing upon improving the environment: As street maintenance services have improved, so has the physical appearance and condition of the streets, parks and other public places.

Additional business benefits are listed in the table below.

Benefits
• The Call Centre can answer more calls without referral and provide more accurate information;
• Reduction in the number of duplicate Service Requests;
• Reduction in the number of site visits;
• Flow-on benefits to other Departments through access to corporate spatial information;
• Use of common address geography to reduce errors and duplication;
• Captures data for spatial analysis and reporting. This will provide improved reporting and enable better decision making for policy initiatives, planning and ultimately support predictive monitoring to identify potential issues before they arise;
• New data sets are collected for skip permits, fly tipping, abandoned vehicles and other transitory features. These are maintained automatically via the application and are available across the organisation;
• Spatial data has been brought together from numerous disparate applications in a common format for the first time;
• Use Oracle9*i* Locator and 9*i*AS MapViewer was covered by existing software licenses; the in-house Oracle team has the skills to support the Spatial CRM extension; reducing deployment costs.

Conclusion

The Council has recognised GI as critical to integrated services and the good stewardship of the Borough. Spatially-enabled CRM has enabled it to cut costs in delivering services by increasing operational efficiency. The success of the project provides new impetus for Havering to deliver on its GIS Strategy.

Future enhancements include:

- Migration to a central Corporate Spatial Database;

- Provide integrated mapping functionality to field engineers;

- Provide citizens the ability to create Service Requests via the internet using the same map interface.

From an Oracle perspective, this solution builds upon the spatial capability provided as standard for products such as Mobile Field Service. It is Oracle's strategy to use technologies such as Locator and MapViewer to provide spatial capability to all e-Business Suite Applications, solving real business problems.