



# SWORD

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SwordCTSpace

## London Underground Information Management Strategy

### Sword CTSpace drives London Underground’s Information Management Strategy forward

London Underground Limited (LUL) was formed in 1985, but its history dates back to 1863 when the world’s first underground railway opened in London. Today LUL is a major business, with over 3 million passenger journeys a day, some 500 peak time trains, 253 stations owned, 275 stations served, over 12,000 staff and vast engineering assets.

In 1998 the British Government announced its policy objectives to secure long-term, sustained levels of investment, vital to deliver London’s network needs. The Government concluded that these objectives would best be met by retaining LUL in the public sector, responsible for customer services and safety, and creating three private sector companies (known as Infracos) which would maintain, renew and upgrade the Underground’s infrastructure under long-term contracts, but would not own the assets.

LUL established Public Private Partnerships (PPP) with three Infracos, each responsible for managing the train, station, track and signals infrastructure whilst LUL remained a public facing operating company, responsible for running the trains and stations safely, determining the service pattern and setting fares. Under the PPP, long-term contracts with private companies will enable more than £8 billion to be invested in renewing and upgrading the Underground’s infrastructure over 30 years.

#### Facing document management challenges

LUL had amassed a vast store of millions of key historical documents that are still required for access, review and use by operations today. In addition, the newly distributed structure of the information among the Infracos, plus the need to manage records, comply with the requirements of the Freedom of Information Act, integrate with or replace multiple legacy systems together presented some interesting document management challenges.

LUL set up a panel made up of stake holders across LUL departments to evaluate their EDM requirements. The panel issued an invitation to tender through the Official Journal of the European Communities (OJEC) and received expressions of interest from more than 50 prospective suppliers from around the globe. The selection process was a rigorous year long consultation evaluation which was completed in 2002 and Sword CTSpace (formerly Cimage NovaSoft) was awarded the contract to supply a comprehensive Document Management System.



#### Challenges

LUL had amassed vast quantities of historical data which are still required for access, review and use today

Requirement to comply with Freedom of Information legislation

Requirement to integrate with or replace multiple legacy systems

Requirement to manage records effectively

Access to data required by multiple parties

Requirement to minimise risk

Requirement to store information held in legacy system

Management of Standards documentation

Connection to business partners

Information to be stored until at least 2041

*“Long term, London Underground are significantly better off using Sword CTSpace’s solution and the Document Controllers are very pleased with their enhanced ability to manage documents. Connect have also realised a 70% reduction in paper usage since implementation”*

Angus Wallis, Project Manager

*“Sword CSpace’s engineering and safety critical background combined with their excellent tender gave us confidence that they would be the right choice to minimise risk”*

London Underground Evaluation Team



### Benefits

99% fit with LUL’s requirements

Management of controlled documents

Management of correspondence

Management of technical queries

70% reduction in paper usage

Standards are properly managed, with authorised users approving changes using workflow and all appropriate users being informed of agreed changes

Workflow process designed to follow the contractual process defined in LUL’s PPP Contract

Workflow controls distribution, response times, alerts, reminders as well as storing comments and approval status

Sword CSpace were evaluated by the stakeholder panel to have a 99% fit with LUL’s functional requirements and the Sword CSpace product roadmap fitted with the LUL information management software architecture strategy. “Sword CSpace’s engineering and safety critical background combined with their excellent tender gave us confidence that they would be the right choice to minimise risk” - the Evaluation Team concluded.

The 3-year contract started with an initial deployment in the Safety, Quality and Environment Directorate and the Contract Services Directorate, before rolling out to other departments across the organisation.

### Initial Deployment

Deployment began with the Connect project – a Private Finance Initiative (PFI) London Underground entered into in November 1999 with the consortium Citylink Telecommunications to provide a modern, integrated digital radio communications system to greatly enhance Underground staff’s ability to pass information to one another and on to customers. The system was configured to manage:

- **Controlled Documents:** Any document types submitted by LUL’s suppliers that require revision control and approval. This application is particularly used to store, manage and approve engineering drawings.
- **Correspondence:** All project related correspondence, such as claims, variations and access requests.
- **Technical Queries:** Queries from suppliers that are then answered by LUL.

“Long term, London Underground are significantly better off using Sword CSpace’s solution and the Document Controllers are very pleased with their enhanced ability to manage documents. Connect have also realised a 70% reduction in paper usage since implementation” - Angus Wallis, currently Project Manager for the 4th phase of the deployment.

### Safety and Regulatory Compliance

Running in parallel with the Connect project was the implementation of an application to manage ‘Electronic Railway Safety Cases’, which are submitted to Her Majesty’s Railway Inspectorate (HMRI) for approval to run the underground. These were held in a legacy system and Sword CSpace now stores them as



paragraphs in XML format that can be collected into a complete document. They can be amended to suit the particular safety case, and then exported to another application to merge the XML sections into both PDF and HTML documents ready for publication to the LUL intranet.

### **Managing London Underground's Standard**

Next LUL implemented Sword CTSpace to manage their Standards documentation. Previously, each individual LUL directorate had been responsible for managing their own Standards. LUL decided to centralise this function and implement an Automated Procedure for Standards Change (APSC) process using Sword CTSpace to store and manage all LUL standards. As LUL's contracts with suppliers are based on LUL's own Standards, it is essential that any changes to the Standards are properly managed, with authorised users approving changes using Sword CTSpace's workflow and all appropriate users being informed of agreed changes.

### **Efficient Supplier Management**

Running alongside the APSC application is the "Concessions" application which allows suppliers to apply for Concessions to LUL Standards in cases where anomalies not covered by the Standards can delay work and increase costs. Suppliers fill out a form from which data is automatically extracted and used to index the form into the Sword CTSpace system and automatically link it to the Standard to which it relates. The application for a Concession is then routed through an approval cycle using Sword CTSpace Workflow before being either granted or rejected.

### **Connecting LUL to its Business Partners**

The next phase saw Sword CTSpace implement the "Automated Works Package Plans" process, again using Document Management and Workflow. The Workflow process was designed to follow the contractual process defined in LUL's PPP Contract with the Infracos. As the Contract is 30 years in length, LUL were looking for a robust and sustainable method for storing and retaining information until at least 2041.

The application, which went live in September 2003, allows the Infracos to submit Work Packages for LUL review and approval. They are stored in the Sword CTSpace solution and the Workflow controls distribution, response times, alerts, reminders as well as storing comments and approval status.

### **Benefits**

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A separate application to store "Business Area Records" will be implemented

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Users are trained in the use of client applications by three dedicated LUL trainers

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The Fusion Reference Library is providing fast access to information for the more occasional users of the system

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Users can now locate documents themselves, whereas previously they would have needed to follow a manual process to request a copy of a document from a Document Controller

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Sword CTSpace solutions are now classified as one of LUL's top ten business critical applications

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London Underground Evaluation Team



### Milestones – Some Key dates

- 1843** - Opening of the Thames Tunnel
- 1863** - The Metropolitan Railway opened the world's first underground railway
- 1870** - Opening of the first Tube tunnel
- 1900** - Prince of Wales opens the Central London Railway
- 1905** - District and Circle lines electrified.
- 1908** - Electric ticket-issuing machine introduced.
- 1911** - First escalators installed
- 1929** - Last manually operated doors on tube trains replaced by air-operated doors.
- 1933** - First Underground map in diagrammatic form
- 1940** - From September, and until May 1945, Tube station platforms were used as air raid shelters.
- 1952** - First aluminium train entered service on the District Line.
- 1961** - End of steam and electric locomotive haulage of London Transport passenger trains.
- 1971** - Last steam-shunting and freight locomotive withdrawn from service.
- 1979** - The Prince of Wales opens the Jubilee Line.
- 1983** - Dot matrix train destination indicators introduced on platforms.

### Boundary Controls and Internal Security

All incoming and outgoing correspondence is now scanned, the content indexed (where recognisable) and then stored within the Sword CTSpace solution. Permissions and access to the correspondence are set accordingly. A separate application to store “Business Area Records” will also be implemented. This will be used to store any documents requiring version control.

### Web Deployment

Currently, 15 LUL sites are accessing documents on the Sword CTSpace system. Users are trained in the use of the Sword CTSpace client applications by three dedicated LUL trainers, using a combination of one-to-one sessions for Document Controllers and group sessions for Document Consumers. The system was originally administered by a single, dedicated administrator who has now been joined by an additional two staff to deal with the increased usage of the solution throughout LUL.

In order to accelerate further the deployment of the system, LUL are now leveraging Sword CTSpace's latest web-based products. The Fusion Reference Library is being used to provide fast access to information for the more occasional users of the system. This helps LUL move more towards a “self-service” environment for documentation. Users can now locate documents themselves, whereas previously they would have needed to follow a manual process to request a copy of a document from a Document Controller. Integration with email is also driving system adoption; documents are now being pushed to users via email messages – the email message contains a secure link to the required document within the Sword CTSpace system.

Sword CTSpace solutions are now classified as one of LUL's top ten business critical applications.

The striking map that is recognised across the globe was the brainchild of Underground electrical draughtsman, Harry Beck, who produced this imaginative yet stunningly simple design back in 1933. Beck based the map on the circuit diagrams he drew for his day job, stripping the sprawling Tube network down to basics. The result was an instantly clear and comprehensible chart that would become an essential guide to London - and a template for transport maps the world over.

# ***SWORD***

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