THIRTY YEARS OF LONDON COMPUTING

An Exhibition at the University of London Library on the Development of the University of London Computer Centre

January 1999
Introduction

The University of London Computer Centre (ULCC) was established in 1968 in response to the Flowers’ report of 1966. Flowers had emphasised the need for regional computing centres to meet a growing demand from researchers. He had recommended a London centre and the University of London’s response was to set up a central facility. Starting as a London centre ULCC moved to being a regional and later a national centre. To facilitate this role it provided for the storage and manipulation of data on a continuously improving range of computers. It also developed London, national and international networking resources. ULCC continues to provide for and upgrade both of these capabilities.

The Exhibition

The items and captions in the cases provide a brief history of the development of ULCC. The display on the boards is about the National Digital Archive of Datasets (NDAD), one of the activities in which ULCC is engaged at present.

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CASE 1

1 Flowers Report
The Flowers’ committee was set up by the government to suggest ways of dealing with the increasing need for computer facilities for research. Its report recognised the demand and the need to meet it. It was suggested that the government should finance regional computer centres providing facilities for the storage and manipulation of data for the use of researchers.

2 The London response
The University of London’s response to the Flowers’ report was to establish a central computer centre with links to other computing facilities at, eg, Imperial and Queen Mary Colleges. ULCC was established therefore in 1968. It moved into purpose built accommodation in Guilford Street, shown here, in 1969.

3 The First Computer
Part of the Guilford Street premises were used for office space and part for a computer room, shown here. ULCC’s first computer was a Control Data 6600. This was leased at first and purchased later in 1970.

4 Connection to other sites
By 1970 ULCC was providing computer services for a number of University of London colleges and institutes via a network consisting of peripherals and display terminals on the central site, and remote facilities for the entry of jobs on punched cards and receipt of output on a printer. Imperial and Queen Mary College had their own facilities which were linked to ULCC. They used ULCC when demand exceeded local capacity. For most of the remaining colleges and institutes ULCC remained for some time the only source of computing services.

5 Computer use
Early use of ULCC’s services as shown here was largely by researchers in physics and engineering.
6 Staffing
One of the early members of staff was Ken McKenzie. He joined ULCC as Computer Manager in July 1968. He was Assistant Director by 1971 and Deputy Director by 1983. He left in 1990. He is shown here with the Princess Royal, Chancellor of the University, on the occasion of the inauguration of ULCC as a national centre.

CASE 2

7 Computers (1)
ULCC purchased its first Control Data machine, a 6600, in 1970. To support the emerging London network (Metronet) a Control Data 6400 was purchased in the same year. Further increase in demand led to the purchase of a further and larger Control Data machine, the 7600, in 1972. The 6600 had 128k of store, the 6400 64k and the 7600 32k of small core store and 256k of large core store.

8 Computers (2)
This view shows the ULCC Computer Room with the 7600, the consoles for the 6600 and the 6400 and the tape drives for the 7600.

9 Regional network
ULCC received finance to purchase the 7600 in return for making its services available to other universities. By 1973 ULCC was providing services to eight universities in the south-east and five in the south-west via a link to a computer at the University of Cardiff.

10 Software
ULCC provided support for and documentation on the computer languages and application software it provided for its users. It produced lists of software and the extent to which it was supported eg, centre maintained (highest priority),
manufacturer maintained, copy available, etc. An example of documentation to help those using statistical packages is shown here.

11 User groups
ULCC has always recognised the importance of its users and providing a service for them. It established a separate user support department in 1974. It has always supported user groups such as the computational chemistry working party. It contributed to the IUCC newsletter, the Inter University Committee on Computing newsletter, to keep its users informed of the activities of University Computing Centres. Further information on ULCC’s services was provided in the ULCC brochure.

**CASE 3**

12 Expansion
ULCC’s computer systems were saturated by 1978. After some debate it was decided to extend and eventually replace them as part of ULCC’s move to becoming a national computing centre. To facilitate this role and provide space for the new computers which it required extra computer and office space was added to the Guilford Street building. Shown here is the ground cutting work for this extension.

13 Computers (3)
ULCC decided to replace its Control Data machines with one Cray 1S and then a further larger capacity Cray 1S. The Crays were machines noted for their fast processing. The first Cray arrived from the SERC Daresbury Laboratory in 1983.

14 Computers (4)
Within three years of its purchase all capacity on the first Cray 1S was in use. A second Cray arrived therefore in 1986. This was being used to full capacity within a few weeks of its
arrival. Both machines were replaced in 1989 by a Cray XMP/28 shown here.

15 National networking
ULCC had been a networking centre since its inauguration. By 1976 users in more than 100 institutions could use the London network known as Metronet via one of the University of London computer centres to access the services of all four centres, (ULCC, Imperial, University College and Queen Mary College). With the approval in 1980 for a national role came approval for a new telecommunications system. Given its existing networking skills and its role as a national centre ULCC was involved with the development of JANET, the Joint Academic Network, linking all Higher Education Institutions. It currently hosts the JANET Networking Operations and Service Centre (JANET NOSC) – the control centre for JANET. Shown here are the links which ULCC was providing in 1993. Five years on the links are still provided but the technology has changed completely from that shown here.

16 Research
Shown here is an example of work produced on the ULCC computer which succeeded the Cray XMP/28, a Convex C3800 called Neptune. The molecular modelling needed the large memory configuration and speed of Neptune.

CASE 4

Microfilm and typesetting
In addition to its storage, processing and networking facilities ULCC also provided typesetting and microfilm services for its users. The microfilm service was provided from 1972 and was complemented by a microfiche service from 1975. Both forms of computer output were of particular use to those needing some form of print-out of large quantities of data in a format which they could handle and consult easily. The service also provided high precision graphical output and animated films.
The typesetting facilities established in 1987 were of particular value to those producing small runs of publications which were not commercially viable and publications which needed fonts not readily available commercially. The typesetting users formed their own user group and produced a newsletter called ImageSetting. The three books on display were all typeset at ULCC.

17 This package could be used to produce additional typefaces.


19 Edited by Robert Pearce, Patrick Gordon Walker, Political Diaries 1932-1971

20 Papers given at the Warburg Colloquium held in memory of Arnaldo Momigliano, 6-7 December 1991.
CASE 5

21 Robotic storage
As its computer capacity expanded ULCC expanded its storage capacity. In 1989, a Storagetek 4400 automated cartridge system with robotic control came into full service. This has since been expanded and can now store 300 terabytes of data. Shown here is the robotic arm which retrieves tapes.

22 The Pilot National Data Repository
This was a JISC funded project undertaken at ULCC 1993-1994 to show the potential of a large scale data store with quick access capabilities to deal with networked access to, and storage of, very large quantities of data from a variety of application areas. Among areas covered were access to satellite images, use by libraries for digitised documents, networked backup, distribution of multimedia information (sound and video) and management of part of the ESRC Data Archive.

23 The Electronic Beowulf
One of the areas covered by the Pilot National Data Repository was the provision of access to and storage of the digital images of the Beowulf manuscript held by the British Library, created by them as part of the ‘Initiatives for Access’ programme. This was of great benefit to scholars since the images are much clearer than a view of the manuscript physically since it is possible to use higher light levels for the short period for which the manuscript is exposed to them for copying. Shown here is a folio from the manuscript although not from the Beowulf text.

24 National Digital Archive of Datasets (NDAD) (1)
The University of London was awarded a contract in 1997 by the Public Record Office (PRO) to house the National Digital Archive of Datasets. The Archive is housed at ULCC and run jointly by ULCC and the University of London Library (ULL). It provides storage for and access to, where requirements of confidentiality permit, digital datasets from central government departments selected by the PRO for permanent preservation.
25 National Digital Archive of Datasets (NDAD) (2)
Access to the data held by NDAD is via the NDAD website. Data users have to register with NDAD but there is no charge for access. Datasets available so far include educational statistics, statistics on museums and galleries and the Welsh Office survey of coastal defences against damage from the sea.

CASE 6

26 Networking
As the main site for national and international network connections in the UK ULCC provides and supports connections between computer systems nationally and internationally. It provides connections to the UK Joint Academic Network (JANET) for over 100 regional sites and manages national and international links on behalf of the UK academic community. The JANET Internet Protocol service (JIPS) established in 1991 extended the global Internet network onto JANET. The operation and daily management of this IP service is the responsibility of the JIPS Network Operations and Service Centre (NOSC) located at ULCC. This service is fully co-ordinated with commercial UK, European and world-wide Internet infrastructure.

27 UKERNA
On behalf of the UK Education and Research Networking Association (UKERNA), ULCC supports the various international and intranational links, including access at 155 Mbps to TEN-155 (the European academic and research network) at 90 Mbps to the Internet backbone in the USA, and at 100 Mbps to the LINX, which provides connectivity with other internet services in the UK.

28 Service to the end user
Benefits to end users from the above links include access to email facilities and to the websites and catalogues of other
academic institutions. Users at home and abroad can check whether or not the University of London Library holds a book which they require before leaving home. If it does not they can check other possible repositories online.

29 FE Support Centre
This centre based at ULCC provides support to 36 colleges connecting to JANET in the south of England. They receive help and advice on how to connect, training, etc.

30 The London MAN (Metropolitan Area Network)
This is a new development which came into service in mid 1996. London HEIs access JANET via the London MAN, the co-ordinator for which is based at ULCC. The initial infrastructure consisted of six core sites, of which ULCC is one, connected by an ATM ring and a further 18 sites connected as spurs.