

New Applications

Group 4 FAX — Case Study

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Abstract

ICI Chemicals & Polymers Ltd and the British Library Document Supply Centre carried out a trial of a Group IV facsimile service during 1989 with NEC equipment. The technical and service issues are discussed as well as a wider examination of the potential of this technology. The main conclusions reached are that Group IV facsimile has cheaper operating costs although it is capital intensive.

Given adequate resource to resolve any telecommunications problems, the majority of technical difficulties experienced were minor. A future Group IV service is largely dependent on integrated flat bed scanners in order to eliminate intermediate photocopying.

1. Background

Imperial Chemical Industries PLC maintains special library organisations on a number of sites in the European Community as well as overseas. These are mainly located where there is a major Research and Technology activity, but not exclusively. For example, the library at the ICI HQ at Millbank in London has more of a commercial/business user community.

Over the last decade, major investments have been made in a wide range of ICI Information Technology facilities. This is not just micro computers but also an extensive mainframe network as well as comprehensive telecommunications facilities. With the exception of facsimile, telex and telephone links, all investment has been mainly aimed at the creation, communication and storage of internal information. There are exceptions, eg:

- Library automation
- Extensive use of online searching
- Current awareness services

However, none of these have contributed to enhancements in document delivery. We find ourselves with relatively good systems for internal document delivery but time has stood still for the procurement of published documents identified as relevant to business operations.

2. The Business Need

ICI Chemicals & Polymers Ltd is a relatively new organisation having been formed on 1 January 1988. It is a wholly owned subsidiary of ICI plc formed from the ICI Chemicals and Polymers Group of four divisions. These were:

- Mond Division located at Runcorn
- Petrochemicals & Plastics Division located at Wilton
- Agricultural Division located at Billingham
- ICI Fibres located at Harrogate

Each of these sites had a major special library serving local needs. ICI Chemicals & Polymers Ltd, often referred to as "C&P" now has a network of libraries under common management located at Runcorn and Northwich in north west England and Billingham and Wilton on Teesside. Together these serve major Research Centres specialising in polymers, materials science, catalysis, fertilisers and biotechnology.

A considerable number of online searches and current awareness profiles are carried out for the extensive user communities involved. These result in "C&P" being a major customer of the British Library Document Supply Centre at Boston Spa. Although PC software developments enable efficient use of the ARTtel system and there is an urgent action service via Group III facsimile, there is a significant gap in services necessary for cost effective research work to be undertaken.

A need was identified for error free, high quality document delivery to be available for those requests needed urgently. Although it would be attractive to have instant response, a "same day" service meets most requirements. However, it had to make efficient use of telecommunications lines so that costs were contained and a potentially large volume of documents could be handled.

The paper published by Braid (1986) concerning work done by Boston Spa and the University College of London appeared to offer a way forward. This was by using Group IV Facsimile on NEC equipment linked directly to Boston Spa. Having researched the technology further, it became clear that this could also be a potential solution for certain types of internal document transfer. Since the comparatively expensive machines (£10,000 - £12,500) had intelligence and networking capability, a later development could be an "internal document supply centre" handling those documents not suitable for inhouse office technology eg:

- Technical documents with graphics, illustrations, photographs etc.

By establishing a link with the British Library, the potential capability of this technology could be evaluated under "laboratory conditions". If successful, this could lead to an on-going service if the technical difficulties were not too great.

After approaching the British Library at the end of 1988, a trial was established in 1989.

3. The ICI/BLDSC Trial

It was agreed that for a trial 8 week period, all requests whether urgent or not would be transmitted to and from Boston Spa by Group IV facsimile. NEC made two machines available, one for Runcorn, Cheshire and the other for Wilton on Teesside. Although it was not possible to establish a guaranteed service, the trial was managed as a self financing evaluation of a future service.

A number of questions were addressed during the trial:

1. Was the technology sufficiently robust to offer the necessary reliability for an on-going service?
2. What are the comparative costs of document delivery using Group IV compared with the existing Group III service?

3. What developments in hardware are necessary to enable more widespread developments to take place?
4. Can BLDSC resourcing/systems handle the volume of traffic (estimated at 40 requests per day)?
5. What proportion of requests require a rapid turnaround?
6. Does Group IV facsimile offer advantages to future ICI Information Technology strategy?

4. Robustness of the Technology

As with any venture into uncharted waters, pioneers need the backing of major resources if success is to be achieved. This trial was no exception - telecommunications had been a major problem in the UCL/Boston Spa work and the British Library had reservations concerning our ability to overcome the inevitable problems. Thanks to the generous help of both NEC Ltd and British Telecom Ltd, the ICI Corporate Management Services Telecommunications team were able to establish the necessary links.

These were essentially "ad hoc" because current facilities were not all digitised and those that were had to communicate through a number of nodes ranging between ICI Wilton on Teesside, Boston Spa, ICI Runcorn and British Library premises in London. This complicated network identified the first problem:

"Communications between Wilton and Boston Spa had to be via Runcorn and British Library premises in London. This led to technical problems which could not be resolved in the short term."

This situation was resolved by redefining the trial to be for Runcorn requests only. This would still enable Group IV to be evaluated and Wilton could rejoin when an ISDN (inter site digital network) was fully operational.

With this exception, few breaks in transmission were encountered. Also, within the limitations of the equipment being used a high degree of reliability was achieved.

5. Comparative Costs of the Technology

A Group IV machine uses ordinary photocopier paper with a built in laser printer as well as a 20 megabyte disk for storing documents in image form before transmission and after receipt. By comparing

the image at both locations, it is possible to ensure error free results. This means that the time consuming scanning operation does not use any telecommunications time but is essentially off line. This makes the actual transmission comparatively cheap but is offset to some extent by the large amount of toner used. Each cartridge lasts for about 2,000 pages and costs about £70 although the paper itself is much cheaper than the heat sensitive paper of Group III. (Group III: 4p/sheet, Group IV: 0.25p/sheet)

However, the toner costs are about 3.5p/sheet making the overall cost of stationery marginally cheaper. The major saving is in telecommunication charges which depend on the nature of the link and the amount of traffic handled. However, this trial confirmed the findings of the UCL study on transmission costs. These savings have to be set against the comparatively high depreciation charges of the capital equipment.

In the case of "C&P", we were seeking ways of speeding up research activity which could yield benefits far in excess of the above costs.

6. Future Developments in Hardware

Other than a few ergonomic considerations inherent in a "first generation" machine, the main technical problem is to do with the scanning operation. Before BLDSC can transmit a document (eg a journal article), it has to be photocopied. This means that the maximum possible quality of the received image is dependent on the quality of the photocopy. This is dependent on the current state of toner in the photocopier and its general condition, whether the document was positioned correctly etc.

Both BLDSC and "C&P" feel that the most important development is the advent of the "flat bed scanner" so that the copying and scanning processes are integrated. This would make it possible to dramatically improve productivity at Boston Spa in that a copy has to be made for any form of transmission whether it be mail or some form of facsimile.

7. Capability to Handle the Volume of Requests at BLDSC

The number of requests per day in the trial never exceeded 40 and these were handled with reasonable response and a high percentage of successful retrievals. If a wider service were undertaken, resource requirements would have to be carefully monitored and assessed.

8. Proportion of Requests Which Need to be "URGENT"

During the trial, users were requested to indicate whether the enhanced service led to an improvement in their productivity. The reply was that about 20% were urgent. This could increase as more people become aware of the advantages of Group IV but is unlikely to exceed 50% in the foreseeable future.

9. The Likely Impact of Group IV Facsimile on Future ICI Information Technology

Without any doubt this technology has a valuable role to play in the transmission of "compound documents". It is essential to streamline the telecommunications so that Group IV facsimiles can be effectively networked throughout the ICI Group. This is beginning to happen now that ISDN is becoming a real possibility.

10. Acknowledgements

1. NEC Ltd for generously making available the necessary equipment for this trial and reacting promptly in the case of any technical difficulties.
2. British Telecom Ltd for making the necessary equipment available. Without this cooperation, the trial would never have started.
3. British Library Document Supply Centre for showing considerable flexibility and willingness to "bend the rules" in order for the trial to be successfully completed in such a short time.

Reference

Braid, J. A. "Space communication and broadcasting" in *Electronic document delivery-a user's view*. Elsevier, N. Holland, (1986) □