THE TILBURG DIGITAL LIBRARY

by Hans Geleijnse
Director of the Katholieke Universiteit Bibliotheek Brabant, Tilburg

ABSTRACT

This paper presents an overview of the current developments in the Digital Library at Tilburg University. I shall discuss our experiences with the on-line provision of primary information to our end-users, of journal articles and papers produced by the researchers of our own institution and other services. Positive experiences as well as problems will be discussed. New projects and prospects will provide direction for the library in the years to come. The university library will focus on the provision of added value to the information process in a global environment and on integration of the retrieval and processing of scholarly (electronic) information with teaching, learning, and research.

1. THE DEVELOPMENT OF THE DIGITAL LIBRARY AT TILBURG UNIVERSITY

Tilburg University in the Netherlands is a medium-sized university focusing on the humanities and social sciences. Currently, approximately 9,000 students are enrolled and the total staff number is about 1,600. The university has a compact campus and a sophisticated infrastructure. The faculties of economics and law have an excellent reputation in both teaching and research.

In 1989, the university started a programme to build a new library and initiated detailed plans for the development of the digital library. The Digital Library Programme at Tilburg University (an action plan for a high-tech Documentation, Information and Communication Centre) aimed to provide staff and students with excellent support facilities for teaching, learning, and research. Key elements in the programme, which initially was supported by Digital Equipment Corp., were:

1. A focus on the use of information technology in order to improve both library procedures and systems, and the services to end-users.

2. The provision of electronic information to the desktop of both faculty and students, on campus and at home.

3. A campus-wide implementation of the concept of the « integrated desktop ».

4. The development of tools for knowledge navigation in order to support the user in locating and retrieving relevant information in the global information environment.

The programme was managed by a partnership of the university library and the computer centre with the firm support of the executive board of the university. The concept of the integrated desktop can be regarded as the cornerstone in the programme. Recognition of the power of electronic communication, the increasing importance of electronic information and the changing opportunities for end-users, who have access to information through their desk-top computer, was the starting point for the development and implementation of this concept. Working on a single computer, the user should have easy and direct access to secondary and primary information, to various software packages and to communication facilities.

In a university environment, the user is a consumer of information, but at the same time students, lecturers, and researchers also produce new information by making full use of the present body of knowledge and enhancing this with new ideas and research results. The output can be a working paper, an article, a thesis, or a book. This process should be supported by the library in close co-operation with the computer centre.

Tilburg University's network connects more than 2,400 PCs, each of them providing access to locally and remotely stored information. For the students, 450 PCs are available in the library along with an additional 400 PCs in seminar rooms. All 1,600 staff have networked PCs on their desktop. The power of the concept of Tilburg University is that all of these 2450 PCs offer the same basic facilities:

1. Access to information

- local OPAC

- local Reference databases, such as the On-line Contents database on journal articles and the Excerpta Informatica database on applied computer science. These references are seamlessly linked to full text information and coloured images;

- networked CD-ROMS

- the National Catalogue and the National On-line Contents database with electronic request and accounting facilities for end-users. Fast document delivery to the end-users can be guaranteed;

- other central databases hosted by Pica, an organisation for library automation, based in the Netherlands and founded by the Dutch university libraries;

- Internet resources;

- networked CD-ROM's;

- management information for both students (including the results of examinations, the reservation system for the desktop computers in the library, etc.) and staff (financial and other administrative information);

- electronic help desk (EVA);

2. ***Software packages,*** *such as word processing, graphical, and statistical software, which are licensed campus-wide and can also be used from home.*

3. ***Communication facilities,*** *such as electronic mail, FTP, and the Trumpet Newsreader.*

The concept of the Integrated Desktop is an example of a user-oriented client / server implementation.

In 1991, the executive board and the faculties agreed to standardize. It was considered that a campus-wide implementation would be facilitated by a homogeneous infrastructure. Standardization was introduced with respect to:

- the network infrastructure within the departments (the standard is the Novell NetWare);

- the desktop computers in the offices and for the students (PCs running Windows are prevalent);

- one preferred PC vendor;

- software that would be supported by the computer centre.

This policy enabled the university to achieve cost-effective solutions.

Although some variations in this approach are currently being introduced as a result of the differences between departments and differences in the level of use of various facilities, basic models for standardization are still accepted and have recently been reconfirmed campus-wide.

2. FIRST INNOVATIONS

- When the new library was opened in 1992, the first version of the « integrated desktop » with access to secondary information, various software packages and electronic mail facilities was made available. Students were encouraged to make reservations for their desktop computers in the library, excellent networked printing facilities were offered, and on-the-spot support was provided.

- A key innovation was the launch of the On-line Contents database. This will be discussed in more detail in the next section. Results from other projects were also available:

- The KUB Guide was a first step in developing a navigational aid in the information environment. In this first version, it was a menu-driven, bilingual terminal interface giving short help in selecting relevant services, such as the OPAC, our local On-line contents database, Excerpta Informatica, and various other dedicated databases. The guide also provided access to local information delivered and maintained by faculties and department,

and was the predecessor of the current KUBweb home pages.

Tilburg University library was also the first European library with a completely automated self-service circulation system, the Lendomaat. With a subsidy from the Dutch Department of Economic Affairs, this service was designed and realized by combining existing technology (local circulation system, bar code reader, security strips, scanners, printers) and with the co-operation of Tilburg university, Pica, the security firm Checkpoint, and SPC, a software house, responsible for the development of the communication software for the various components.

3. FROM SECONDARY TO PRIMARY INFORMATION

Until 1994, the library focused on the electronic provision of secondary (bibliographic) information. In 1991, Tilburg University started its own local On-line Contents database with references to the articles of the 1,600 most important journals the library subscribed to. Content pages were scanned and OCR and the information was locally stored in a database. This local project formed the basis of a national service, which has been running for four years and which is hosted by Pica. In 1995, we closed our scanning department. We now rely on the subset of the national On-line Contents database (containing the 12,000 most important and most requested journals in the interlibrary loan circuit in the Netherlands) maintained by Pica. >From this database, we can download the data that match our own holdings. The data of this On-line Contents database are currently being produced by Swets & Zeitlinger. At Tilburg University, part of this data is supplemented by abstracts delivered by Elsevier Science and other publishers, and abstracts and keywords produced in-house by library staff members.

The provision of the full text of the journal articles to the end-users was a logical next step. In 1994, Tilburg University was the first institution in Europe to enter into a licence agreement with Elsevier Science with respect to their electronic subscriptions. In 1995, electronic access could be provided to the Tiff images of the 120 Elsevier journals on economics and social sciences the university subscribed to. In order to work efficiently with bibliographic data and full text images, Tilburg University developed the KWIK software in co-operation with Digital Equipment. This « KWIK » software is based on the Mercury software, originally developed for UNIX workstations at Carnegie Mellon University. At our university, it runs on PCs equipped with MS-Windows software.

It is clear that browsers such as Netscape and the boom of the Internet motivated us to change from a customized and sophisticated approach to open WWW solutions, although this meant losing some functionality, such as a clear distinction between viewing and printing, and performance. Access to bibliographic and full text information is now being provided via WWW, based on the implementation of the results of the project Decomate (Delivery of Copyright Material to End-Users) which was funded by the European Commission. This project was co-ordinated by Tilburg University,

with the London School of Economics and the Universitat Autonoma de Barcelona as partners, and was completed in March 1997. The project received high praise from independent experts appointed by the EC.

The Decomate software is applicable to various local environments and can handle materials from various publishers in various formats. The Z39.50 protocol is used for the transactions with database servers. The software is now available for implementation in other libraries.

The full text database of Tilburg University was extended with the PDF files provided by Kluwer Academic and Academic Press, and will be expanded in the Autumn of 1997 to include various journals on Dutch law provided by the legal division of Kluwer, including the most popular legal journal in the Netherlands, the « Nederlands Juristenblad ».

The corpus of about 200 full text journals will be extended by a new license agreement with Elsevier Science that will provide access to 160 journals the library does not subscribe to but which are relevant to the subjects taught at the university. Access to this copyright material will be provided on a pay-per-view basis. For Elsevier and the university, it will be interesting to see what happens if these services are offered at affordable costs and with prices compatible with the Inter-Library Loan fees.

In this paper, I will not go into detail about experiences with publishers and our policy with respect to license agreements since these topics will be covered later in the course in more depth.

4. TILBURG UNIVERSITY AND ELECTRONIC PUBLISHING BY RESEARCHERS

It would be unwise for a university library to only focus on digital material delivered by a publisher. Actually, many libraries are discussing a potential new role for libraries in the electronic publication of documents produced by the parent institution.

The library and the computer centre at Tilburg University currently support **the electronic storage and access of research papers** produced by university researchers, in particular, the Department of Economics and Centre, the top institute for economic research in the Netherlands. Faculty members provide the library with a hard copy of their paper as well as an electronic version in Postscript. The library then enters it in the National Catalogue and the local reference database. Conversion of Postscript files to PDF is carried out by the computer centre. Library staff provide the papers with keywords and make these papers accessible through the World Wide Web and the local reference database Attent.

This initiative has been expanded to a nation-wide project (The Degree project). All universities with Economics departments are participating to make most of the economic research papers produced in the Netherlands available through the network. In Tilburg, the papers are accessible through a local reference database Attent, through the national

WEBdoc database (a project of Pica, Dutch and German libraries and the Research Libraries Group in the US), and through WoPEc, the international database of research papers on economics. The National Funding Council regards this initiative as an example for other subject areas.

Another project deals with the creation of a brand-new electronic journal: The **Electronic Review of Comparative Law.** The goal of this project is to develop an editorial, technical, and organisational concept for an electronic journal that publishes high quality articles in English with an international editorial board. Quality is ensured by high editorial standards and a strict electronic peer review system. We would like to see the electronic format used to its fullest effect:

- to link articles with legal sources like legislation and judicial texts;

- to link discussion and comments to published articles, creating an open - but controlled - platform for discussion among peers.

The university library will manage the project in close co-operation with the Faculty of Law (which appointed the editor-in-chief), the Law Faculty of Utrecht University, and our Computer Centre.

5. OTHER PROJECTS

Tilburg University library and the computer centre are currently involved in the following projects:

- the development of a serials management information system (local project);

- IT projects at the university aimed at improving the quality of learning:

- a project to train the university teachers in order to make better use of the infrastructure and current information technology;

- course information on the Web;

- a research project on the use of printed and electronic journals in co-operation with the University of Maastricht (nationally funded project);

- a project on searching heterogeneous databases, such as the On-line Contents database, Excerpta Informatica, the local (Pica)

OPAC and Silverplatter CD-ROMS, using Z39.50 (nationally funded project);

- ELISE II (European project), the second phase of the successful ELISE project from the Third Framework of the Telematics Programme of the EC. ELISE I produced image banks in two libraries (Tilburg University and De Montfort University, UK) and has demonstrated interconnection. ELISE II aims at the development of an operational infrastructure for networked image information in Europe. The project is co-ordinated by De Montfort University in the UK, with IBM Scientific, The Victoria and Albert

Museum, Limerick University, the Université Libre de Bruxelles, and Tilburg University as partners;

- A very interesting and innovative project, « Virtual Library on Economics » started in July, 1997. It is a co-operative effort between Tilburg and two other Dutch university libraries, the University of Maastricht and Erasmus University, Rotterdam. The project aims at developing a virtual serials collection on economics, since the three libraries together have such a comprehensive assortment of resources on this subject. The first phase of the project is to improve the services to end-users with respect to access to, retrieval and delivery of all journals the libraries subscribe to. The partners regard the extension of services as a practical starting point for co-operation on collection management and collection development. It is envisaged that a user from the University of Maastricht will have seamless access from his or her desktop computer to bibliographic information and abstracts of journal articles stored in electronic or printed form in Tilburg or Rotterdam. It should be guaranteed that the user can have the full document (either in electronic form or a copy of the printed version) within a reasonable time span. Once these facilities are in place, they will offer a tool and act as a basis for decisions about journal subscriptions at all three sites. We regard this as a bottom-up approach to a nation-wide policy of co-operation in collection development. It is obvious that heavily used journals will be needed locally for the time being at three different sites, but long-term agreements can be made on hundreds of specialized journals and journals of the second and third categories. This project is funded by the National Science Council as an important initiative to enhance the development of the Dutch Virtual Library.

6. EXPERIENCES WITH THE DIGITAL LIBRARY SERVICES

We have now had five years of experience with the campus-wide use of the services provided on the integrated desktop. On the whole, they have been positive:

1. The library is overcrowded. Students make extensive use of the library resources. Ninety percent of our students regularly use the integrated desktop computers. The library is a meeting point and working place for university students.

2. Most electronic services, which have been implemented since 1992, are heavily used by both students and staff.

3. Currently, the "integrated desktop" is not only a cornerstone of the Digital Library programme, it is also widely accepted as a key element in the strategy of the university. It is the basis for IT innovation projects in teaching, learning, and administration.

4. The university library is drawing more and more national and international visitors. Over the last 5 years, the library was visited by more than 7000 professionals, librarians, computer centre managers, and researchers from more than 24 countries.

We have also identified some important problems:

1. The most important problem is that it takes more time to integrate new information services into the educational process of the university than we expected. Individual use by students is excellent, but more faculty could make full use of the opportunities provided by the electronic information environment. A significant number of teachers have so far been reluctant to invest time in new technologies and in an innovative approach to the educational process. It should also be stressed that a growing number of professors and teachers are engaged in projects in order to present their course material in electronic form and to stimulate interactive use of the current electronic facilities.

2. New services demand instruction, training, and user support. The library should not underestimate this. The fast changes in programmes and interfaces are easily accepted by some users but can be an awful surprise for many others. The need for a coherent and well-elaborated planning and communication policy is obvious. First of all, however, there is a need for a constant interaction with users about what will happen tomorrow and why, and which issues can be decided locally. A balance should be found between the need to offer state-of-the-art services and the need to maintain a homogeneous and well-accepted infrastructure.

3. The open environment in the library requires more regulations with respect to the use of the computers by students (for that reason, a reservation system and a time-out system have been developed), security measures, and clear policies for proper and correct use of the facilities.

7. SOME DATA ON THE USE OF ELECTRONIC SERVICES

One of the advantages of electronic services is that we can log events in our database and generate more detailed information on the use.

Some data on entries to important databases can be provided:

	1994	*1995*	*1996*
OPAC	*105,521*	*127,168*	*190,159*
On-line Contents	*29,000*	*52,864*	*73,828*
CD-ROM's	*83,291*	*89,771*	*105,463*

The On-line Contents database is a good example of an excellent new service (started in 1991) that took some time to gather momentum, though it now plays a prominent role in the digital library services. We expect that this will be the case with electronic subscriptions.

It is also interesting to see how the use of the full text articles is developing. The numbers for the use of the reference database are good, the numbers for viewing reasonable, and for printing are, as yet, very limited:

	1995	1996

Number of views of articles	*11,624*	*15,784*
Number of prints	*690*	*1,237*

It should be stressed, however, that there are some implicit and explicit limitations to the full use of the journals provided by Elsevier Science and Kluwer Academic:

1. There is still a lead time of four to six weeks between the arrival of the printed version of the journal in the library and the arrival of the electronic files. Of course this lag will disappear in the near future, but it nevertheless is an impediment. Researchers who are used to immediately browsing through the new issues of their favourite journals frequently complain about it.

2. The critical mass of the electronic information provided is still limited. The Elsevier journals account for less than 5% of the journals covered in our local reference database. This conclusion was also reached in the TULIP project in the US some years ago.

3. In addition, it should be stressed that the delivery of Academic Press files is still not running smoothly.

8. USER DEMANDS

It will take some time for these new facilities to completely mature and be adopted by all users. It is also clear that the development towards the provision of full text articles to the desktop will soon result in a completely normal service. Top researchers who are currently regular users of our database are very enthusiastic about it and want us to proceed. This indicates that in a couple of years the digital library, or rather the networked library, with ample access to digitized or digital material, will be an accepted phenomenon and a standard service.

The initial phase in the development of the digital library too frequently confronted the users with changes. Stability in systems and services is required for users to feel comfortable. It would be a good thing if we could manage to maintain the « look and feel » for the end-users and to make improvements and new versions « behind the screens ».

Another demand from the user community is that we should provide one interface to heterogeneous databases and make everything much simpler : one way to access our OPAC, our reference databases, our CD-ROMS, with full potential for simultaneous searching across these databases and with a guarantee for document retrieval and fast document delivery.

The most important issue that is mentioned by users is that they expect the library to support users and provide tools and tailor-made facilities to deal with the information overload. This offers important opportunities for libraries to redefine traditional roles and functions : selection, service, and support. The skills and know-how of library staff can play a significant role in meeting these challenges.

The important role of library staff was confirmed in a user study carried out in 1996 on the services provided by the computer centre and the Tilburg University library. One of the interesting results of this study was that students very much appreciate the computing facilities and electronic services, but regard the staff of the library as the most important category. The support, skills, and attitude of staff is the most important factor in determining the performance and appreciation of the library from the students' point of view.

9. LIBRARY STRATEGY

9.1 Access and ownership

Libraries will identify their own strengths and weaknesses and decide on their strategy for the future according to their own specific situation. However, one of the important aspects for most libraries deals with the strategy of access and ownership of documents. There is an increasing focus on management information and selection of relevant information, irrespective of where and how the information is stored. This is particularly true for libraries that have limited resources. These libraries have to make firm decisions and choices based on the strengths and scope of their parent institution. The opportunities for co-operation, partnership, and creation of consortia will be carefully considered.

9.2 Knowledge navigation

In addition to a seamless access to heterogeneous databases which are distributed and located at various sites, we would like to implement personalized information services for the end-users : current awareness services based on defined user profiles.

It is clear that for many researchers the key issue is how to deal with the information overload. Most of them do not want to read more, they want to read less. The information selection process is a critical issue. For that reason, it is important to provide and refine tools for tailor-made selection of information. Supporting the discovery of knowledge might become the most important activity with which the library can support the information process making use of traditional library skills that are completely upgraded and adapted to the electronic environment.

These initiatives indicate that we are gradually shifting from activities related to the development of the local digital library to activities that focus on interconnection with other rich information sources, gradually creating user access to the "virtual library". Additional tools to navigate in this virtual environment are imperative.

9.3 Integration with teaching and research

The third cornerstone of the strategic goals of the Tilburg University library for the next three or four years emphasizes local dissemination and stimulation of a structural integration of the digital/virtual library services

with teaching, learning, and research.

The availability of full text information and capabilities to do full text searching, and to cut and paste relevant pieces of information will increase the use of the integrated desktop. Scientific work will be more effectually supported. There are also important opportunities for redesigning the educational process. It will be clear that the key to change can only come from the faculties. Libraries can only support this change in interaction with the users.

From our perspective we can and will focus on:

1. clear information on services and systems;

2. more continuity and stability in the "look and feel" of the end-user environment;

3. tailor-made training facilities for university staff;

4. instruction for students as an integral part of the curriculum;

5. personal and electronic support;

6. tailor-made current awareness service;

7. collaborative research projects with university staff.

For the future of a university library, it will be vital to enter into new partnerships with the staff of each faculty and to support their work in a new fashion. Although the information is available in a virtual environment and users do not necessarily have to go to the library, the library will still be a real organisation dependent on the skills and knowledge of its staff.

REFERENCES:

1. *The new library and the development of innovative information services at Tilburg University*, Tilburg University Press, 1989;

2. Leo Wieers, ed., *Documentation, Information and Communication at Tilburg University. Plan of Action* - Research - Services, Tilburg University Library, 1990;

3. H. Geleijnse and C. Grootaers, ed., *Developing a library of the future: The Tilburg experience*, 1994;

4. H. Geleijnse, Journal Articles on the Desktop. Elsevier and Tilburg experiment, in: *Managing Information*, 1994;

5. J. Dijkstra, A Digital Library in the Mid-Nineties, Ahead or On Schedule ?, in: *Information Services and Use*, 14, no. 4, 1994;

6. H. Roes and H. Geleijnse, Library Innovation: Experiences at Tilburg University, in: *Encyclopedia of Library and Information Science*, Vol. 58, Suppl. 21, 1996;

7. J. Dijkstra, A generic approach to the electronic access of scientific journals: the Decomate project, in: *Proceeding of the Elsevier Electronic Subscription Seminar,* Heemskerk, the Netherlands, 1996;

8. H. Geleijnse, The Digital Library, in: *Learned Publishing,* October 1996.

ROTTERDAM LIBRARY PAST 2000

by Frans Meijer,
Director City Library of Rotterdam

After having lived in this city for the past 25 years, and developing quite an addiction for her in the process, I started my new job as the Rotterdam Public (Municipal) Library's Director in March, 1995. At the interview for the post I even had to admit I was not a registered member yet. And I still prefer to buy my books rather than borrowing them. One of the new Central Library's regular and enthusiastic visitors, however, I have been from the very first opening day in 1983.

SOME FACTS AND FIGURES

From 1983 on, the Central Library has attracted some 2 million visitors every year. They add up to another 2 million local users of the 22 branches, equally divided over the North and South river banks. No other institution or attraction in the world's no 1 Port boasts this 4 million figure. Nearly a quarter of the city's population are registered members, i.e. 140,000. They account for some 5 million loans, out of a collection of 1.8 million. We subscribe 2,000 periodicals, among them 80 foreign newspapers. Then our collection includes 700 CD-ROM's and 14,000 video's. Every year a 100,000 new books are acquired (30,000 titles). And since we recently freed space to accommodate the (separately run) Record / CD Library, our visitors can now choose from an additional 150,000 records and 180,000 CDs, the largest collection in Europe. We are proud that numerous visiting colleagues from all over the world have mentioned Rotterdam's City Library with some acclaim, and strive to live up to that standard.

CENTRAL LIBRARY

The modern and, like it or not, anyhow from an architectural point of view remarkable building our Central Library is, forms a sound home base for our operations. The City Council still regards its Library as one of Rotterdam's showpieces and has taken many a foreign visitor round our premises. And apart from being impressing the building is also functional, as I can now tell from my own experience. Still, one of my main objectives from the very start I made in 1995 has been a thorough renovation of the library's main entrance. After its 13 years of being intensively used it stroke me as outdated, inconveniently arranged and worn out. Also, as a regular visitor, I have always found fault with the ground floor arrangement. Inspiring examples for better solutions could easily be found in our own country and abroad over the past five years. Such comparisons clearly showed what have turned out to be lapses in the original layout of our building. In fact, there are three obvious reasons for the necessity of a drastic redesign, mainly of the Library's ground floor:

- an update of the late 70s concept and a face„lift owing to unexpectedly rapid wear resulting from intensive use of the building;

- space for new functions: new media; co-operation with the Record / CD Library; a new Information services set-up; switch of first and second floor functions; a new Local Information / Rotterdam Desk run by the Library (previously Civic Centre advice and information desks were staffed by various municipal services);

- adaptation to recent nearby urban developments: a huge open space / market place on the doorstep; a new front entrance to enable easy access from the main street, underground and train station; a new high-rise building opposite.

The original architects Van den Broek & Bakema designed the renovations, for which four million guilders were voted by the City Council.

THE RENOVATION

What disappeared?

- the roofed public passage between the separate newspaper reading room and the main building,

- the book & card shop in the old central hall,

- the imposing security counter right at the front door,

- the space consuming insular circulation desk (combined book collection & lending counters),

- the municipal Civic (Advice &) Information Centre,

- our exposition hall.

What has been added?

- a large revolving front door with easier access from the main street and public transport,

- a spacious central hall (1,000 sq. m roofed agora) with Rotterdam counter overlooking front door and security counter well aside,

- separate book collection and lending counters, also aside,

- Record / CD Library (run separately),

- Library Café next to Theatre foyer,

- first floor / terrace outdoor café,

- bicycle shelter directly attached to façade.

This architectural face-lift solves a number of long„standing user problems at a time:

- easier access between front door and escalators,

- put an end to the security problem of the separate reading room,

- much abused passageway exchanged for valuable interior space,

- a more logical connection created between Library and Library Theatre by linking Library Café between the two,

- Information Dept. connected to related functions in central hall by switching first and second floor functions,

- « musical gap » in own collection filled by accommodating the separately run Record / CD Library,

- adaptation to surrounding urban area realized; entrance hall / agora now suitable for live events, presentations, expositions, performances, etc.,

- visitors no longer confronted by security counter; the Rotterdam counter overlooking front door now also functions as reception desk,

- as the Rotterdam counter is always fully staffed, limited opening hours of the previous Civic Information Centre (40) are now extended to full 60 hours (64 in wintertime),

The first half year since the opening of the new entrance, in July, 1997, actually did prove us right in our assumptions about the above mentioned solutions.

A VISION FOR THE FUTURE

Along with the redesigning process, the Library has thoroughly reflected upon its future position in the Rotterdam community. We wrote a paper entitled « *The Library of 2001* », in which (certain overlaps / lapses cannot be avoided) library issues are roughly regarded from four main perspectives: Information, Education, Culture and Recreation.

1. Information

I often have said I wanted a large « ***i*** » mounted on the roof, « ***i*** » for information, to mark our building as the public information centre. The Rotterdam counter has proved itself as a more than adequate successor of the abandoned formula of the municipal Civic Centre, where visitor figures dramatically declined of late. This was also due to the fact that the municipal services, which staffed the desks gradually, reduced their efforts in order to open up their own various information desks spread over town. Since the Library took over, we have been able to extend our services from the 40 town hall office hours to 60 library opening hours. As a public library we aspire to provide a reliable, comprehensive reference service, no more and no less, by means of brochures, up to date on-line-connections and expert, well-trained staff. Since it opened in September, 1997, the Rotterdam counter has put a tenfold increase of questions on the record compared to its predecessor.

This very ambition to become **the** public information centre is sustained by the development of the new media. Rather than regarding the Internet as a threat of traditional library values and procedures we have thought it best to welcome its new opportunities as a medium. It is true, a good deal of the criticism about lack of organization, redundancy, and even trash, on the Net I would not want to refute. But isn't the Internet at the same time, actually more than anything else, a golden chance for librarians to grow into their new roles as « cybrarians? », i.e. reliable pilots who know their way around and guide people through cyberspace.

In our Central Library, we presently have 10 Internet connections at the public's service and soon this service will be extended to the branch libraries. Since 1996, the Library's own website allows for browsing through our catalogue from people's homes.

2. Education

Education makes a growth market for libraries. Especially in our 22 branch libraries there is a most intensive co-operation with local primary schools. This means a minimum of 3 (introductory) school class visits of the local library for all 4-12 year olds and, apart from that, school class lending to 75% of the Rotterdam primary school population. This means that every single one of our branch libraries accommodates 30-80 groups every 4 to 5 weeks. We also operate a special mobile school children's library. Our wish for the future is to be able to extend these activities to secondary schools.

Our Central Library accommodates 700 students, individually or in groups working all over the building, so in specially designed study corners right between those book shelves relevant for their subject. In the near future, we intend to open a so-called Open Learning Centre, where computer courses will be held for the general public (non-students). We have also planned the reintroduction of one or more traditional study rooms (silence areas).

3. Culture

Rotterdam is trying to foster a cultural climate, and the Library strives to play a prominent part in this. In 1996, we had a midnight party with a unique voice performance by 150 meticulously choreographed volunteers reading out aloud in colourful single file on the escalators. To our great pleasure this turned out to be the absolute highlight of the municipal cultural R'96 Festival.

In the autumn of 1997 a local network broadcasts a weekly live cultural & literary programme from the Library Café, including brunch. We often have Author's Dinners and every year, to conclude the annual National Book Week, a Literary Breakfast is served for 120 guests fortunate enough to acquire a ticket, where a prominent author is interviewed. Our Library Theatre (seating 180, some 200 performances per year) was granted a special municipal subsidy in order to further enhance its standard of programming.

The absolute hit among special events so far held in the renovated

library was without a doubt the first and unique « Great Readers' Party » on November 8, 1997, organized in close co-operation with the Rotterdam booksellers. No less than 2,500 visitors filled the Library into the small hours, attracted by a programme well covered on TV, including interviews with writers of fame and many other performances on several stages throughout the building. There was music, drink and food in plenty, and, for the truly fit and brave, disco dancing to exhaustion. As far as I am concerned a new Rotterdam tradition is born.

And with the 1,000 sq. m great hall before my mind's eye, I can see many a cultural highlight to follow.

4. Recreation

Lending out books remains a Library's core business, despite all new developments and functions that may occur. Although the Central Library becomes more and more of a study centre, a meeting place of cultures and an information centre for the general public, the recreational aspect of its existence must not be underestimated, nor denied. With such a vast collection of books in 25 languages, CD-ROMS and videos, the Library caters for, also, the recreational needs of a great many of its customers. In a society where those employed, it is true, work under growing stress, while on the other hand the percentage of people who (have to) live leisurely increases fast, pastime is a main issue. Be it plain pastime as such, or upgraded in terms of permanent education or personal development.

With the accommodation in our main building of the Record / CD Library (with 150,000 records and 180,000 CDs the largest in Europe), which until 1997 was established elsewhere in town, the collection at our users' disposition has been really completed.

We now have « any number » of general as well as specialized books on Bach, the composer's collected musical scores, and, since recently now, a great number of recordings, in various settings and interpretations, of his unrivalled body of work. And, not to worry, the same holds for the jazz, pop, rap, house or you-name-it scene.

URBAN DEVELOPMENTS

The far reaching reconstruction of the ground floor is also a reaction to recent nearby urban developments. The « elevated railway » has disappeared, went underground so to speak, thus allowing for a much better view of the Library. A huge open market space (already nicknamed The Runway) has been created. Except on the two weekly market days this vast space lies deserted, at the same time, because of its main function, being unsuitable for manifestations of a more prolonged character. Thus two market days result in five idle days, which is really a shame on this costly A1 city centre location.

In our « high street » (Hoogstraat), a 17 floor apartment building has been erected, and presently the « cubicle houses » are being renovated.

Activities and changes are taking place, or have already been concluded, at three sides of the Central Library. Urban development schemes have been designed all around the said huge « Runway », with two prominent anchor points which stand out firmly between all these developments: the historic St.-Laurens Church and the new Library.

We already took a first step out upon the street by planning a beautiful outdoor café on a first floor terrace. To be followed by steps like: second hand book markets, musical and open air film performances, etc.

In the 5 to 10 years to come much will change for the better in this part of the Rotterdam City Centre.

SAN FRANCISCO PUBLIC LIBRARY (SFPL)

New Main Library: A case study

by Kenneth E. Dowlin
Distinguished Visiting Professor
School of Library and Information Science
San Jose State University

An Intelligent Library Building is a building whose Decision Support System and Command and Control System senses or predicts a need to change some aspect of a function of the building. The system then provides the information to a decision-maker for human intervention, or executes a change in the appropriate building system and reports it to the decision-maker. The San Francisco Public Library main library is a dramatic step in moving the state-of-the-art toward a true Intelligent Library Building for the 21st Century.

For many citizens of San Francisco the new MAIN LIBRARY is a Dream come true. It provides a facility that moved its operations from the Old Main Library, a 19th Century Building, into one of the first 21st Century Library Buildings. In the process, the library became a true City Icon. This project leads me to believe that the LIBRARY OF THE 21st CENTURY will be based on Community Expectations from both the past and the present. The library design was based on information from the community, collected through public opinion surveys, community focus groups, and numerous public hearings on the plans and design. As a result, it became clear that the community wished a continuation of the historic compact. That is, they wanted the library to provide all of the traditional functions such as a repository of knowledge, a centre for reading and learning, and a lively presence in the neighbourhoods and the city. At the same time, it was obvious that the community expected the library to provide leadership in the use of technology for access and preservation, providing expertise in organizing information and knowledge, and ensuring that the traditional librarian's values and leadership would continue. While the book collections remain important to the public, they also expect the 21st Century library to use all current and future Communications Technologies. The energy generated by the process of planning, funding, designing, and building the library transformed it from just a mediocre institution into an Icon and hallmark of the Community.

ROLES FOR LIBRARIES—HISTORIC

Throughout the last hundred years or so, the communities in the

United States have generally supported a number of roles for libraries:

Repository of knowledge

Most of the operations of the libraries designed in the 19th century were designed for collecting books into one facility for the common good of all. Books were scarce resources and sharing them made sense for community economic and social policy. Over the decades the collections were expanded to include journals and other print items. At that time the focus was on collecting and preserving these scarce resources. The users had to come to the facilities and were subject to strict rules about the use of the material. The library was seen as a large book warehouse. Collecting was the priority.

Access to information, knowledge, learning, and the joys of reading

In the 20th Century, the role was expanded to include expansion of access to those who needed it. The collections became better organized and finding tools such as the card catalogue were developed. The warehouse was distributed throughout the community into branch libraries, and even mobile units. Automated inventory and cataloguing systems were then developed to locate specific items for specific requests and to indicate their availability as well as their location. Libraries began allowing the public to take the material home. Reference services were expanded to include information services. The library as an information centre became a large part of their role in the 1960s and 1970s. It was understood that items that could not be located, nor used at the convenience of the user had less value. The shift was from collection to access in most of the public libraries. As the collections grew in size a greater effort was required to organize the items within the buildings so that the users could find them. With the increased use of the libraries, it was necessary to place greater reliance on self-help.

Engaging people in reading and learning

Some functions of educational institutions became a part of the library's purpose. Literacy programs and other structured programs for learning were incorporated for the community. Many librarians realized that a population that could not read would provide little support for libraries and started adult literacy programs. It became more common for the public libraries to co-operate with, and in some cases, supplement the libraries of the schools.

Creating and maintaining community archives

Most local libraries maintained a collection of non-book historic information of their own community. These Local History Collections seldom reached the sophisticated level of the cataloguing of the book collection or the level of archival institutions but these collections became more and more important over the century.

Resource for local government

As the library became more accomplished at both the archiving and the provision of information services the function of a resource centre for the operations of the local government grew. It was often seen as a way to garner support of the elected officials and other decision-makers in the community. Some libraries developed very sophisticated services. Occasionally, librarians and other staff were housed in the city halls to provide a direct link and visible presence for the service.

Research library

As the collections grew, some of the libraries built the resources to meet research level needs for their community. A number of them reached the collection size necessary to be recognized as a state or national resource. Often times, the public perceived any large collection as having the depth and breadth to support work at the graduate or scholar level and assumed that all publicly supported libraries should serve the general public whether or not that was their mandate.

ROLES FOR LIBRARIES – NEW

As the libraries grew in size and the management became more knowledgeable and connected to the communities they served, new roles began to emerge over time.

Community communications centre

The centrality of the services to the social, cultural, and educational life of the community led the library into serving as a centre for community communications. The branch libraries are often pivotal in the neighbourhood and the main library is usually centrally located in the city. The implementation of new technology such as video, television, computer networking, and on-line data systems for the purpose of collecting, organizing, and preserving the collections provided the tools to the library for a much more sophisticated level of communications. At the same time, there was the understanding that the globalization of the mass media was creating a void of communication about and within the local community. Many public libraries became proficient at this new role. It does create new requirements for the library buildings: the provision of meeting rooms, the incorporation of the spaces for the communication technology such as television studios and computer rooms. Often these spaces have to be open different hours than the library, and require a separate controlled entrance. The computers and telecommunications require access to the equipment spaces by the technical staff 24 hours a day.

Incubator for community programs

The ability of the library to collaborate with other organizations can lead to programs that are developed in the library then moved to larger outside facilities. An example is the co-operation between the SFPL

Electronic Discovery Centre for children and the emerging Children's program at the new entertainment complex at the San Francisco Convention Centre. The entertainment complex needed significant work to create and implement the program before their physical building would be available. The library in return received technical help in the development of their program from the staff at the entertainment centre. This kind of collaborative venture requires spaces in the buildings for the teamwork.

Global village library

The rapid growth of the Internet is providing the opportunity for libraries to interconnect and share resources on a scale not even imagined 20 years ago. While the technology is readily available and becoming very cost effective, the organizational infrastructure is not in place to define the roles and responsibilities of local and regional libraries in a systematic fashion that lets a person in need of information readily identify the best library source on the network.

Information technology training and support

There is little question that maturation of computers and telecommunications has brought about one of the most massive change in libraries in history. The utility of the technology, while not changing the basic mission of the library, has changed forever the way of doing business. The design of library buildings must include the spaces and infrastructure to support massive use of information technology. A significant challenge is to design a building that may not even be completed in five to seven years and must last at least 50 years while the technology is changing very rapidly. The use of new technology has forced libraries to incorporate training programs for the users and staff into their facilities. These functions require additional spaces with a different layout.

Electronic archives

The development of electronic archives in most libraries is still in its embryonic stage. There is simply not enough implementation to measure the impact on storage requirements for physical materials such as books. There is some evidence that if the organization is developed to share resources such as journals there could be a significant reduction in physical space. While the magnitude is unknown, planners must be in a position to make decisions of the impact early in the project. On the other hand, if the journals are to be provided by electronic external sources, there must be guarantees that those sources, or replacement sources, will be available during the life of the building.

Hardware & software support

The information technology use of the 21st Century library must be planned, defined, and measured in order to provide the spaces, the telecommunications infrastructure, and the furniture to support the use of these devices. Tables for reading a book are much different than tables that

support computers that are interconnected via the network. Equipment peripheral to the computer like printers and scanners must have adjacent space. The digitization of collections may have the effect of reducing space requirements, but the space needed for the machines and users is greater than what was provided in the 19th Century library. Space must be provided for the set-up and maintenance of the equipment as well.

Networking

The need for the infrastructure for the interconnection of the communication devices such as telephones, computers, and television require the planners and designers to knowledgeable about the spaces and spatial relationships of the network for all of the different technologies. Other elements often overlooked are also networked. The life safety system that includes smoke and heat detectors is usually networked to central control and observation points. Most modern security systems are networked for space observation and perimeter access control. The modern building is a maze of wires, fibre optic glass, conduits, raceways, and vertical risers. The telecommunication system should parallel the electrical system for easy access. Perhaps, at some time one thread of glass will suffice to connect all of the devices that need to be connected. In the meantime designers must deal with the different modes—wire, glass, and wireless broadcast at the same time. While it appears technologically feasible to integrate all of the networked elements into one distribution system the protocols and the segmentation of the designers and industries prevents this integration. The pervasive requirement for networking has forever changed the operations of the library.

The current and projected roles of the library requires a rethinking of the historic paradigm:

« Finding the right book for the right person at the right time »

To a new paradigm:

« Connecting the right data, information, or knowledge to the right person at the right time ».

SAN FRANCISCO PUBLIC LIBRARY

San Francisco is one of the oldest large cities on the West Coast of the United States. It currently has a population of around 750,000 inhabitants and has its population increased by over 40 per cent between 9 to 5 due to the commuters. The population in the city is very dense with the geography covering only 49 square miles with half of the space in parks and other open spaces. It is often characterized as the city that appears the most European of all United States cities. The city has a long literary tradition and has many bookstores. There was a thriving publishing and printing industry for much of the history of the city but most of them have moved to lower cost locations. The library was founded in 1877, making it one of the oldest in the west and grew to include the main library and 26 branches. Most of its

growth was stimulated by the grants from Andrew Carnegie during the early 20th Century. However, in the last 10 years a massive program of retrofitting and expansion of the older facilities was undertaken. More than $150 million has been spent on buildings, furniture, and equipment. The voters approved a bond measure of $109.5 million in 1988, the Library Foundation raised more than $30 million from the private sector in three years, and several seismic safety bond issues city-wide had generated one of the largest capital budgets for a library in the United States. The only cities with larger public library capital budgets have at least three times the population (Chicago and Los Angeles).

Although the old main library, which opened in 1917, was a state-of-the-art building using steel construction techniques the functions of the building were designed on the precepts of library service of the 19th Century. It was basically organized as a large space for book stacks on seven tiers, a reference room, and rooms for readers that were all grouped around a grand staircase. It contained 176,000 square feet of space on three levels. It was anticipated that the building would serve 800 people per day. In the 1960s, the building was re-arranged into subject departments and the stacks were opened to the public. Since the building was not designed for this organization it resulted in very inefficient use of space, loss of security for the collections and users, a maze like organization, and too many staff service points for the budget to adequately support. The building was declared at physical capacity in 1947 and attempts to create funding for a new one continued for over 30 years. The first bond issue failed miserably.

The hiring of a new City Librarian in 1987 served as a stimulus for the leadership to try again. Kenneth Dowlin was hired by the Mayor specifically to create a new main library. Having built a number of main libraries and branches during his twenty-five year career as a library director he had experience in funding, designing, and overseeing the construction of libraries. As a result he developed a set of « laws » based on his experience in building projects, his experience and studies in systems analysis, and his knowledge in the use of information technology. Dowlin was interested in the system elements that comprise a large library operation and posited the following elements and their requirements:

DOWLIN'S LAWS FOR LIBRARY BUILDINGS

The building must facilitate the effective and efficient flow of materials through the library.

The first point of attention should be the location and layout of technical services to minimize handling of books and should be located near the loading dock. The books should be in secure areas at all times, flow through the department in a system, and be easily added to the collections throughout the building when processing is complete. (This requirement led to major dispute with the staff in that department since they wanted to be located on the top floor for aesthetic reasons.)

The second point of attention should be to the return of books from the user to the shelf, the shelving of books used in-house, the flow of books from the shelf through checkout, and the books going out the door. All of these should flow as smoothly as possible.

The third point is the retrieval and return of books to stacks closed to the public. While labour intensive it is an important part of the collection preservation strategy.

Item handling should be minimized in all settings, distances travelled should be minimized, and the building must facilitate the movement of items in bulk through the use of elevators, conveyors, and pallet-based transport. The borrower should be able to return the books to a bookdrop located at the perimeter of the building. The transport system should take the items through an automated check-in procedure to a sorting centre where the books are batched for delivery to the appropriate floor via a vertical conveyor system. While the technology is not mature for full automation of the process, the building is to be designed in such a way that the system can be implemented when developed.

As items are moved through the building, the decision support system should collect statistics at every step of the way and provide management information on the efficient flow of materials. Items used in-house should be scanned during the process of being returned to the shelf in order to provide statistics on use. (The statistic collection and reporting is a key part of the creation of an Intelligent Building.)

Since the most cost-effective way to move items from the shelf to the check out centre is by the user, the signage and directional system is critical to the success of the building. The self-checking machines allow the library to distribute that function throughout the building, thus facilitating self-use by the user.

While the building should facilitate self-help by the user, it must also provide a secure environment for materials that are rare or not replaceable. Closed stack space is a major tool for this preservation strategy. Items that are most used and are replaceable should be out on open shelves. Archives and source material must have additional levels of access validation in place. These two strategies are well understood by the library community and the users. What is not understood is that significant parts of the collection of large, historic libraries are not replaceable even though they are not rare. Thus there needs to be three levels of access:

- Open shelves for browsing

- Closed stacks for an added level of access validation

- Archival shelving for source materials

The movement of people through a building that will attract thousands of people a day is a very important part of the design analysis. There are a variety of types of users: tourists who are just looking at the building, casual users who are retrieving specific items, and people who

need quiet personal space for concentration. The flows of these different types must be understood and plotted to maximize the spaces available. Designing a building that serves thousands of people at a time creates a premium on the spaces for quiet contemplation. These spaces must be located away from the travel zones.

The final law is derived from the fact that all library collections grow over time. When asked « How large should a new library be ? » the response should be « As large as you can afford. » Libraries always fill up. It is only a question of time.

All of these requirements place a premium on the systemic view of the movement of people and materials. The building must serve as a facilitator not a hindrance. People and collection items should flow naturally into, through, and out of the building with a minimum of direction. Having observed library users for decades, it is evident that when people enter a building and don't know where to go, they will go to light (an important role for an atrium). In the United States, they will go to the right. An understanding of these habits can make a significant difference in the efficiency of the building.

EARLY DESIGN

The early design established that the building should be approximately 425,000 square feet in seven levels, must conform to the design criteria for the Civic Centre in which the building was to be located, and would need a budget of $120 million. Each level was to be as generic as possible, with zones for reading spaces, staff workspaces, closed book stacks, and as open as possible. Functions that were high profile or high use would be located on the entrance level and, while there would be some functions that were grouped by departments, most of the books would be shelved in the Dewey decimal sequence from the entrance level up. It became obvious that the major challenge would be to more than double the usable space of the building; yet do so in the same dimensions of height, length and width of the old building. In other words, put a seven story building in the same exterior dimensions as the old building, which had only had three levels. The plan was approved by the Library Commission and the Chief Administrative Officer (CAO). The CAO had the responsibility and authority for the design and construction of all public works in the city. He was concerned about the $120 million cost estimate and required a great deal of convincing before he would endorse the bond issue for the funds. He eventually agreed with the City Librarian and took the project to the Board of Supervisors who could decide whether or not to place the bond issue before the voters. The chair of the Finance Committee who had the power to decide the issue required the CAO and City Librarian to reduce the total amount and to include monies for branch renovation, and come back with the plan the very next day. As a result, the 7th level (mostly for book stacks) was eliminated and the library lost over 60,000 square feet. Because of this, the City Librarian made sure that the design incorporated easy access to an

abandoned convention facility underground that would provide expansion space as the library collections grew.

The bond issue passed with 78 per cent approval of the voters and architects were selected and hired. Having seen some of the problems resulting from design competitions, the City Librarian was set against that process. The CAO and City Librarian agreed that the selection of the architects would be based on their ability to design a building that would meet the program needs of the library. A consultant was hired (the retired architectural critic for the New York Times), a committee to review the credentials of architects was selected, and an announcement was posted world-wide. Thirty-two firms responded by submitting their credentials and examples of their previous work. The firms were required to be either local or to partner with local firms. The technical committee assessed the firm's financial capacity to undertake such a project, their ability to design a large public building, and narrowed the field to six firms. A community-based committee including members of the Board of Commissioners, community activists, and political leaders was formed to interview the finalists. After the first series of interviews, three firms were selected for another interview. At no time were they to present a design for the new library. The team selected was composed of the firms of Pei, Cobb, and Freed of New York City and Simon, Martin-Vegue, Winkelstein, and Moris of San Francisco.

PLANNING AND DESIGNING

The survey taken by the library before the bond issue election indicated that the members of the community would support a new library if it was world class, state of the art, and had an outstanding program for children. The Program Plan done by consultants, HBW and Associates, of Dallas, Texas provided the starting point for the design. The plan was based on focus groups of staff, members of the community, and important stakeholders for the library. The architects translated this plan into architectural plans, drawings, and specifications. It was understood by all that in order to function into the 21st Century the building designers must focus on communication functions. These included:

- Video viewing and production inside the building with a connection to the cable television head end for transmission of library programs is required. There must be an internal video network that connects all of the meeting rooms and the auditorium. The infrastructure must include the installation of a satellite receiver and transmitter on the roof to receive microwave or satellite transmissions.

- The building should be designed to support over 1100 computers on a high-speed network and connected directly to the Internet.

- The library will have four times as many telephones as the old library.

All of these systems are to be connected through a sophisticated system of conduits, risers, raceways, and distribution closets. There was a

requirement that the changing of the location or pathway of any of the devices can be accomplished quickly by library technicians.

It provides group meeting spaces ranging from intimate conference rooms for the public on every floor to a wired auditorium that seats 265 people. These rooms can be used for training of the public and the staff as well as for meetings.

In addition, the office space for library employees was quadrupled, made secure and designed for the comfort of the staff. And the library must include spaces for a number of enhancements or support functions including:

- A café for the public to enjoy light meals and snacks,

- Extensive exhibit space throughout the building and in a specially created exhibit hall designed for national travelling exhibits,

- Spaces for receptions and even dinner events after hours,

- An office complex for the Friends of the Library,

- An office complex for the Library Foundation of San Francisco,

- Spaces specifically designed for the adult literacy program,

- Spaces specifically designed for programs for the disadvantaged user such as the blind, deaf, and dyslexic.

The old main library was designed to function as a book warehouse with some space for readers. The new main was designed to function in the communication age.

THE BUILDING SUCCEEDS

The new main library is a world class facility, it is state-of-the-art in its use of technology, and it has one of the largest children's library centres in the world. It brings people in, excites and inspires them, increases the space for the users by over 400 per cent, protects and preserves the collections while increasing access, and is ready for the functions in the 21st Century. The building provides the centre for the Community Communications Program for the entire community.

THE PEOPLE OF SAN FRANCISCO LOVE IT!

SFPL – Indicators of Success

Over one million people visited the new library during the first ten weeks. Sometimes there were 14,000 users per day. Within 3 months, the library was averaging service to over 750,000 people per month (the equivalent of entire population). Nearly one third of the users accessed the library electronically since the library had an excellent website. Depending on the indicator, the use of the main library increased seventy to several

thousand percent. At the same time the use of the branches increased 28 percent. The City Librarian took a community dream, created a vision, raised the funding, and led the design and construction to turn the dream into reality. (A 21st Century Building)

Standards for Excellence

Almost all groups in the design and construction of the library were committed to excellence. As a result there are many elements that create a new standard of excellence in architecture, community support, and library programs. These are:

- Funding

The voters of San Francisco, by 78 per cent, approved the largest bond issue in the history of the city in 1988. This vote committed $104.5 million to the building. Over the next several years bond issue for city-wide seismic safety improvements to city buildings increased the library's capital budget by another $20 million. The San Francisco Public Library Foundation raised over $30 million in less than 3 years to fund furniture, equipment and building enhancements. In 1994, the issue of long term operational funding was taken to the voters. Again, over 70 per cent of them approved amending the city charter to guarantee that the library's operational budget would be set by a formula that raised the budget over 100 per cent within two years and prohibited the elected officials from reducing the level of funding. This action committed over $450 million to the library over a 15-year period. The people of San Francisco believed in this project so much that they were willing to commit over $600 million to their library.

- High volumes of users

The building sets a new standard for public buildings in the service to high levels of user attendance. The building facilitates the flow of thousands of people through the building, provides different spaces to meet their specific needs (quiet spaces, group work areas, traffic areas), and through the horizontal and vertical traffic zones moves thousands of people to where they need to go in a very efficient way.

- Special service areas

The library was intensely crafted to meet the requirements in the program plan. The Children's centre is one of the best in the world. It provides special areas for the pre-schooler, for children in the first few grades, and for the older children. For the first time the SFPL has an area for teenagers. The affinity group centres are celebration spaces for the diverse populations in the city. San Francisco is one of the most diverse cities in the world in terms of ethnic, cultural, and linguistic differences. These centres which required the raising of private funds created collaborations between the library and the Gay/Lesbian community, the Chinese/American community, the Filipino/American Community, the African/American community, the Latino/Hispanic community, the environmental

community, the supporters of rare books and fine printing, and the San Francisco history buffs. They are showcases for collaboration and community support. The library contains numerous exhibit spaces ranging from departmental or special centre to a gallery for national travelling exhibits. The building supports the varied and diverse service programs with its ability to provide visual enhancement to the collections.

- Life/safety

The systems for the detection and notification of safety services such as the police department and fire department as well as the building engineers and security force create a new level of security to the workers and users in the building. Upon detection, the building can evacuate smoke from the entire building in less than 12 minutes and the exiting allows the evacuation of over 10,000 people in less than 12 minutes as well. Base isolators to absorb shock in the event of an earthquake support the building itself. This building is one of the safest in the world for seismic events.

- Lighting

The lighting is exceptional, maximizing natural, shielded light for the reader and staff, yet supplementing it with artificial light when needed to raise the level. The variety of light fixtures provides the reader with a choice of types of lights. The tables and other work surfaces provide task lighting that can be switched on and off depending on the users preferences. The east, south, and west windows contain computer-controlled shades that are activated by light sensors on the roof. The north side windows provide exceptional natural light for the reader. The incorporation of hundreds of computer screens as well as video screens required special attention to the placement of the lighting for the computers. Most of the lighting over the work surfaces is reflective and contains special spectrum florescent light tubes. The artificial lighting is placed so that at night or on cloudy days the difference to the user is not detectable. The atrium, the light wells, open vistas, and windows allow natural light to reach every floor and public space of the building. At the same time, sunlight directly on the book collections or in the eyes of the readers or staff is prevented.

- Attracting people

The architecture with windows that allow people inside to see out and people outside to see in creates a beacon that lights up the entire civic centre and encourages people to enter. The spaces are comfortable and inviting.

- Furniture

The furniture is all custom designed to meet program specifications. All pieces of furniture are modular which allows interchangeability of parts. The user tables are constructed for easy disassembly for repair yet prevents the vandal from taking it apart without special tools. Tabletops may be

quickly removed and refinished in the event of vandals. The chairs are designed to be solid yet comfortable and were tested for strength at a national furniture testing laboratory for ability to take long and rough use. All tables are designed to support computers and other information technology. They are certified as electrical appliances by the national testing bureau and provide access to power at every work surface as well as connections to the telecommunication distribution system. The staff desks were selected with the advice and testing of staff. While every piece of furniture was designed to be artistically pleasing, they are functional and were all tested for strength and endurance.

- Electrical distribution and supply

A key system in an intelligent building that must support information technology is the power source. It is fortunate that the building was located at the intersection of three different high voltage, under-ground power lines. Thus the building has three different network feeds; any one of which can supply the building. In addition a high capacity generator is tuned to support the electrical needs of the life safety system and the main computer centre in the event of a catastrophic power failure from outside.

- Security

The security system for the interior of the building provides visual surveillance and motion detection of the entire building to the security control centre. This centre is adjacent to the user entrance and exit point that contains the collection theft detectors. It was specifically located there because it is at the point where security personnel can physically reach any part of the library that needs their attention quickly. Even though there are three exterior entrances, there is only one point to staff for monitoring the public's access to collections. The entrance and exiting control is one of the major design triumphs for the architects. That location also facilitates the supervision of the community communications centre, which may be open, when the rest of the library is closed. They have computerized control over the perimeter security system, the elevators, and all of the internal security zones such as staff work areas. The entrance to any secure area is logged and the identification badge scanned is checked for authorized entrance. While the security staff is trained to mitigate any life safety situation they are also trained for customer service to the user who is not a problem.

- Custodian

The managers and staff of the custodial department were involved in the design of the building and were able to contribute their expertise to the architects to ensure that the building could be cleaned. The staff changed their schedules so that the building is cleaned during hours that the library is closed to the public except for those areas that must have cleaning during the day, like the toilet rooms. Spaces were programmed into each floor to provide storage of equipment and supplies for the cleaning function.

- Maintenance

The head of the maintenance department was involved in the design of the building at the highest level. He was relieved of his ongoing responsibilities one year before opening in order to monitor the construction and to receive training on the new systems such as the heating, ventilation, and air conditioning. Even that was not enough time to be as well prepared as he should have been. In the new building, he is responsible for very sophisticated mechanical, electrical, and computer monitor systems. Every one of the maintenance crew became knowledgeable in the operation of computers and the systems. The technical knowledge required was increased by a factor of ten. The maintenance staff's involvement in the design resulted in significant cost savings for the life of the building. One example is the 5-story work of art containing backlit disks with author's names inscribed. The head of maintenance noticed that the design called for hundreds of small light bulbs and expressed his concern over the maintenance. His work with the architects and the artist resulted in the disks receiving their light via a fibre optic distribution system lit by a handful of bulbs in a place easily accessible for maintenance. The planning not only allowed long term cost savings for maintenance but also enhanced the sculpture with the fibres becoming part of the visual effect. In a metaphorical vein the sculpture not only displayed the names of authors, it showed that with networking and the location of their works in a library their value were extended.

Because the head of maintenance had significant academic education as well as experience and training in his field, he led the development of a computerized system that provided the scheduling and supplies inventory system for the building systems. Maintenance takes place on a schedule that emphasizes preventative work, which reduces the fixing of problems.

- Air Quality

A major effort occurred to prevent the air from becoming stale, even unhealthy. There had been a number of large public buildings identified as having « sick building » syndrome and everyone on the project was committed to take every step possible to prevent that situation. During the process, one of the architects became quite knowledgeable and was responsible for monitoring all the systems for quality. The air is constantly refreshed and redistributed throughout the building. The ventilation system ensures fresh, filtered air constantly. However, the open spaces within the building also allow the air to move naturally. The light wells on two sides of the building are topped by open louvers that allow air to exit the building of its own course. This supplements the artificial system and in the event of failure of the ventilation system the hot air can exit naturally. In the early operation of the building part of the air-conditioning failed. Even though it was a record high temperature outside the building never became uncomfortable for people. A great deal of attention was paid to preventing toxins from entering the building. There is no laminated furniture or woodwork in the building. All adhesives had to meet air quality standards. Machines, such as photocopiers, are located in specially vented rooms. The

air entering the distribution system from the roof is not only the cleanest air in the area; it is filtered to the micro level.

- Art work

The building contains 6 major works of art. All of them were collaborations between the artists and the architects and all of them contain metaphors pertaining to books, the library, and knowledge. The staircase connecting the sixth and fifth floor and its accompanying piece suspended from the ceiling portray the artist and architects' impression that the path to knowledge is not linear, it is like a cyclone with knowledge at the centre of the vortex. The five level black granite wall with illuminated author's names is a tribute to the creators of knowledge and literature. It carries forward the tradition in beaux art library architecture of inscribing the names of authors around the top perimeter of the outside of the building. This can be seen in libraries all over the world. James Ingo Freed, one of the principal architects, wanted to bring the names inside and the artist insisted that the selection of the names a community committee task. This true library of the community lists the works that the people in the community use and value, not some list developed by those in authority. The ceiling of the Gay/Lesbian centre is a heroic mural with special significance to that community. A wall that divides the open public spaces from the back of the house on three floors contains cards from an out dated shelf list catalogue. Over 50,000 cards were selected and annotated by members of the public and mounted on the walls. There is no protective surface over them and it is the intention of the artists that over time they will fade to a patina. The artists saw their work as portraying the role of the card catalogue for many years – serving as the intermediary between the seeker and the collection. The card catalogues of most libraries in the U. S. have been displaced by the computerized catalogues and will become historic artefacts. The cards in the work of art will fade away over time as well. The ceiling above the service desk of the children's department contains a glass sculpture outlining the dimensions of the desk in the ceiling. The glass is etched with the word « book » in over 50 languages, symbolizing the fact that the collections in the children's department contains many languages (over 70 at last count). A mural containing much of the literary history from central and South America graces the Hispanic/Latino community meeting room. A member of the Hispanic/Latino affinity group who raised the money to enhance the room commissioned this work of art with the library's approval. Many features of the building show the artistic touch. The elevator doors, the metal grill works, the light fixtures, and even the top of the atrium are works of art.

- Vistas

The building contains many open spaces that allow the visitor to view across the floors or down to other floors. There is a sense of openness. Yet, it provides intimate spaces as well. There are many visual surprises for the people going through the building. Many people are delighted with what they see. These vistas also allow the air and light to move through the

building creating a very comfortable atmosphere for the user and staff.

- Communication Centre

This centre houses the wired auditorium that seats 265 people in a room with wonderful finishes and very comfortable seating. Every part of the room is easily accessible to the handicapped including the stage. The acoustics are wonderful and the sound system is very effective, yet unobtrusive. Full audio-visual equipment is built in and the room is designed for video taping and simultaneous translation for foreign visitors. The hearing impaired may use a special system to enhance their hearing. The Hispanic/Latino community meeting room contains a catering kitchen and can be divided into two meeting rooms when needed. Public restrooms, toilets, the gallery, and the café are located in this space which can be made accessible when the rest of the library is closed.

- Disabled access

The building was designed to not only provide full access to disabled users; it was designed for them to enjoy and to be part of all that goes on. Special committees for each handicap reviewed the plans for elevators, ramps, and other transportation zones. The building contains centres for the blind and visually handicapped, the deaf and hearing-impaired, the dyslexic, and the illiterate. The building contains over 200 talking signs for the visually impaired. A person needing assistance may pick up a device that is about the size of a garage door opener at the blind centre. When the infrared beam on the device « touches » a talking sign, the sign transmits a message to the receiver indicating what is located at the sign or what is ahead. This was a new technology at the time and the building is one of the largest implementations in the world. The system has now been adopted as a standard by the U. S. government and many cities are implementing it on streets and transportation systems. It is possible for a blind person to navigate from various facilities in the Civic Centre Area using this technology.

- Project management

The management of the project, while failing in some respects did establish a new standard for San Francisco for the hiring of minorities in the trades, consultants and professionals. The cost estimating process was exceptional. This resulted in the city not only obtaining the construction contract for the estimated price, but also allowing the addition of all of the alternative proposals requested by the City Librarian and the architects. In addition, the base isolation system costing over $7 million was included in the contract price. This excellence in cost management resulted in a $130 million building for only $115 million. The management was also able to avoid any labour disputes or work stoppages from labour problems.

- Telecommunications

The telecommunications system supported over 300 personal computers and 600 terminals in the building at the time of opening. Changing equipment or their locations is much easier than in the old library where electricians were required to make any changes. Library staff can now make the changes. The building supports a very dynamic environment. The telecommunications network parallels the electrical network. There are telecommunication closets with switching panels on every floor and in every department. The under-floor ducts, raceways and vertical risers ensure that the access to the network is never more than four feet from any spot (except for the areas with bookshelves). The staff work areas and public service areas are entirely flexible.

RECOMMENDATIONS FOR IMPROVEMENTS TO THE PROCESS

Management

The library did have some difficulties dealing with the huge volume of users during the first months and required time to work out the operational patterns. The building has performed extremely well and the difficulties that have surfaced are due to staffing and organization problems. Most of them stemmed from the fact that the City Librarian had the responsibility for the project but, because of the complicated city legal structure, did not have the direct authority over most of the project. The City has a Commission form of government where the Mayor appoints seven members of the community to have responsibility for the operation of each of the departments. During the nine years that the project was underway there were four different mayors and over forty different commissioners (7 at a time). Since two of the mayors were at the opposite poles politically, it was surprising that the City Librarian was retained when the administration changed. In addition, the contracting function for capital projects in the city is the responsibility of a Chief Administrative Officer through the Department of Public Works. It had been nearly 20 years since the city had undertaken a project of this size and public nature. The City Architect, the Head of the Department Works and the different staff members had little current experience. In addition, a City Controller and a Board of Supervisors controlled all of the funds. The 11 members of the board (there were over 40 different members during the project) had little knowledge of building projects and no understanding of the requirements for a 21st Century library.

As a result of lack of authority, a number of elements contained in Dowlin's Laws and the Program Plan were not successfully carried out. The City Librarian knew from experience that there must be a major program of organization development that would involve the staff in the design and to prepare them for the move. The city, however, did not see the need and would not allocate funds in the budget for training, communication, and team building. In addition, the employee organizations with the backing of

elected officials successfully opposed the shifting of labour costs to lower pay employees for the materials handling function that was critical to a smooth operation.

Technology

Some of the elements for the intelligent building were not implemented. The on-line Decision Support System was not created due to the lack of resources for the unobtrusive data collection throughout the building nor for a real-time data display system. This was a field for which there was little experience in libraries and the architects and consultants did not have the expertise to create such a system. While the City Librarian was able to locate private and federal funds to acquire and install a system for traditional library house keeping functions such as circulation, serials control, and an on-line public catalogue, funds were not forth-coming for programs that needed significant development by staff or by contractor. The same was true for the system for sophisticated fund accounting. The responsibility for the budget and accounting for the city rests with the City Controller who did not have the capacity to implement a sophisticated accounting system for the library. One was promised, but not delivered until over a year after opening.

The systems for the self check out of books by users, automated check in, and interactive networked directional systems were not implemented for the same reason. The city was reluctant to spent money for experimental technology or systems.

The plan for the minimization of handling of materials failed when the contractor was forced to make some changes to the design in order to accommodate structural changes needed for seismic safety. Additional changes in the emergency exiting plan were made due to requirements of the fire department. The changes were made without the City Librarian's knowledge and it is assumed the contractor, architects, and city agencies involved did not understand the impact that these changes would have to the long-term efficiency of the building. Similarly the contractor selected a sub-contractor to develop the chute system and vertical transportation system for the books that had no experience in book drops, book chutes, or other means of moving books through mechanical means. The book drop, chiselled into granite was too small to receive most of the collection, the books dropped precipitously thereby damaging many of them, and the conveyor belt was not adequately designed and installed to protect the books.

It was the hope of the City Librarian that with the recent advances in the telecommunications technology there would be one network with a large bandwidth and high speeds support all of the telecommunications (computer network, video, security, life/safety, public announcement system, networked building graphics and directional technology). It seemed reasonable to expect that they could all run on one fibre-optic distribution system. Or conversely, all of the protocols for all of the signals from the

different systems could be digitized to one standard system to flow through the computer network. While there are some systems that combine some of the functions they are rare and the specific industries and suppliers are not interested in them.

In the rush to get things done and the interest in involving the staff in the planning process for their area the original plan to reduce service points throughout the building was not implemented. The staff in each department worked with the junior architects to create very large, traditional service desks that appear to be dramatic over-kill and extremely inflexible. The original concept of shelving the books in one numerical sequence in the two zones (public stacks, and closed stacks) fell apart during the process of staff involvement in the plan for the move and the actual movement. To be fair to the staff, the move was required to take place in less than ¼ of the time originally planned. The date for opening was set by the political leaders and it had to open on time even though the contractor did not get his work done three months before opening as planned. This situation meant that the formal commissioning process that had been in the plan and timeline, the well-organized movement of materials, and the time for staff to be trained in their new home fell by the wayside. The last six months were frantic.

PROBLEMS

Space

The incorporation of the old convention centre into the plans and program for library remote storage has not taken place for political reasons and the library is short of space. (Remember that the Board of Supervisors eliminated an entire floor of nearly 60,000-sq. ft. for shelving due to concerns about cost.) In addition, a change order in the middle of construction lowered the ceiling in a shelving area that reduced the shelving. The full implementation of the American Disability Act during the construction reduced the shelving in the open public shelves as much as 33 percent. As a result, the library does not have the capacity for shelving that was originally specified.

Steps

It was the desire of the City Librarian to have a facility with no steps. Steps make second class citizens out of mobility impaired people. While ramps can be constructed to alleviate the barriers they create additional cost and create a perception of secondary status. In libraries, they create difficulties in moving books on carts or in bulk on pallets. Exterior steps create spaces for homeless people to park. They also create situations where people can easily fall. In fact the exterior steps along with raised planters attracted skate boarders from all over the area who saw the library as a new skating ground. Some of them are intent with marking the public architecture with their boards. This seems to give them status with their peers. There are mitigation strategies for both problems. Hand rails, barriers,

and visual clues had to be retrofitted to prevent people from falling down the steps in the base of the atrium. It was a disaster waiting to happen. The grand views and vistas stimulated people to look up – not down to the steps. Several people broke arms and legs before the city could provide the mitigation. The skateboarders can be mitigated by cross cutting grooves into the surfaces that they skate on. (It is estimated that the cost for discouraging the skate boarders is in excess of $200,000 at SFPL.)

Toilets

It was the desire of the architects and many of the staff to provide toilet facilities on every floor. The cost of cleaning and security for this would have been prohibitive. The library is the only public toilet facility in a large part of the city and the facilities are used by a large number of people. The City Librarian was able to reduce the size of the public toilets on the upper floors to smaller ones and with a large facility on the first floor near security and custodian facilities. Unfortunately, the small toilets had interior locks on the doors and became a tremendous security problem.

Terraces

The architecture of the building called for various exterior terraces at different levels. While experience showed that they could not be secured for public use, the staff could have the opportunity for pleasant exterior spaces that were protected from the street and the public. Only one of the terraces was provided with doors, a terrace surface, and railing. This is a pleasant area for staff, especially the smokers.

Carpet

The architects were convinced that they could use the carpet to provide visual clues to uses of the spaces and to provide and intimate setting for large open spaces. The City Librarian, having had extensive experience with problems with carpet was just as convinced that the carpet design would be expensive to implement, would be too complicated to install, and would lead to major problems in time. The City Librarian was proven correct. The carpet had problems even before installation was complete. The design was too complicated for the mill to meet the specifications, too complicated for successful installation, and was delivered late. The moving of the books was delayed due to the installation of the shelving, which was delayed due to the carpet manufacturing and installation. The carpet seams began fraying immediately. The entire carpeting will have to be replaced.

Fixtures

Irrespective of constantly being reminded that the library would be an attraction to a wide diversity of populations and that all furniture and fixtures should be designed for ruggedness and prevention of theft, some slipped by. The soap dispensers in the toilet rooms were removable and became prized items for the homeless. The beautiful chrome fixtures identifying each floor at the elevators became favourites with someone and

disappeared within days. Other items such as wastebaskets in public areas were overlooked. Library staff had to make an emergency purchase to remedy the situation.

RECOMMENDATIONS TO OTHERS

Services to users with special needs

It is recommended that the special services for the handicapped be grouped together and centrally located. Access to this centre should be easy and inviting. At SFPL, these functions were distributed throughout the library. This requires a higher level of staffing for these programs and distributes the specialized technology which complicates maintenance and staff support. In most cases the technology is not used since the public and staff does not know how to use it. In addition, the individual who does not know how to use the on-line public access catalogue and other information technology should be considered educationally disadvantaged and training and support should be provided in the centre.

Management

Adopt the shelving pattern early in the process and stick with it. The location of materials should be based on use patterns. Old bound volumes and government documents that are seldom used don't need to be on browsing shelves. The statistics collection for the management of the collections in the building is critical if the three level access program is to succeed. Ensure that the library has full time expert staff adequate to the level of the project. SFPL suffered from the lack of authority and expertise on staff. Funding for an organization plan with either outside consultants or an adequate internal staff needs to be available early in the project.

Staffing

Create the staffing patterns needed before the building opens. If at all possible the re-shelving of books should take place at night when there are no users to ask the shelvers directional questions. Be prepared to have more flexible coverage at service points to deal with the ebb and flow of users. At SFPL the usage on the weekends is two or three times higher than during the week. This is a significant shift and is probably due to the fact that a much higher proportion of users is from out of the city and travel greater distances. Minimize the user service points and centralize the Information Technology near the service points. Much of the librarian's time now is in training and directing the user in the use of Information Technology.

Schedule

If a long-term project needs more time for completion the opening should be delayed. This is usually difficult due to political agendas or public relations reasons. There must be adequate time for training, moving, and breaking in all of the systems and equipment. When a project is complicated

and lengthy there is pressure to get it finished. People get burned out and want it to be over. The formal Commissioning Process was part of the plan for SFPL but there was no time to implement it. Because of the furious pace at the end of the project, it was like converting from a DC-3 to a 747 in mid-air. There were less than six weeks to move, and the contractor was still working on the building. Then the people poured in. The conversion was made even more challenging since the city would not fund the modern instruments (the Decision Support System) or the training for the crew to make the transition.

CONCLUSION

The SFPL new Main Library was one of the largest and most complicated projects in the history of public libraries. Thanks to the efforts of hundreds of people, thousands of donors, and several hundred thousand voters the library is complete. It has become a city icon. The funding and creation of the building and equipment was a tremendous challenge for the City Librarian. The ultimate challenge will be the acceptance of the elected officials, the press, and the staff of the changes needed in the organizational culture, staffing patterns, and labour costs to enable the building to function at full efficiency and effectiveness. The building is there -- one of the first 21st Century libraries. It remains to be seen if the city leadership and staff can take the next steps in services and collections.

The Magic of libraries is not in the building, not in the collections, and not even the staff. The Magic is in the CONNECTION. Connecting minds with different knowledge, ages, and cultures. The successful library in the 21st Century will focus on connections. The successful library building in the 21st Century will enable those connections to happen.

A BEAUTIFUL, USEFUL MACHINE FOR SERVICE:

THE DENVER PUBLIC LIBRARY

by Rick J. Ashton
Director, Denver Public Library

ABSTRACT

A successful public library building serves first of all as an effective machine for the provision of library service, both traditional and forward-looking. It provides both the backdrop and large portions of the script for the fruitful dialogue of exploration and discovery in which the work of the public library takes place. Supporting both customers and staff, it helps educate, inform, inspire, and entertain the community it serves.

Second, the successful public library building marshals in an energetic collaboration the talents, skills, and ambitions of a host of people. These people create a product whose usefulness and beauty give it enduring value for its community. The Central Library of the Denver Public Library, a major building project completed in 1995, provides a vehicle for the demonstration of these points. It is a beautiful and useful machine for service, produced by a complex collaboration, and treasured by its community.

1. DENVER AND ITS LIBRARY

Denver, Colorado, USA, founded in 1859, is home to five hundred thousand people, the centre of a metropolitan area of two million people, one mile above sea level, at the eastern base of the Rocky Mountains. The Denver Public Library, founded in 1889, has pursued an ambitious agenda of service to this community. The first sentence of its current Mission Statement reflects this ambition: « The Mission of the Denver Public Library is to help the people of our community achieve their full potential. »

In addition to its large Central Library, the Denver Public Library operates twenty-two branch libraries of varying sizes and a bookmobile. It employs about five hundred full-time and part-time staff members, with a full-time equivalent of 440. It holds two million catalogued volumes, two million United States Government Publications as a Regional Depository Library, thousands of feet of archives and manuscripts, more than half a million historical photographs of the American West, and a significant regional art collection.

In 1996 it circulated 7.5 million items and completed 1.4 million reference transactions. It delivers its catalogue to the public, along with free Internet access and many other on-line products, through a network of 500

personal computers. It has offered remote dial-in access to its catalogue since 1986.

2. THE LIBRARY BUILDING: A MACHINE FOR SERVICE

John Cotton Dana, the first City Librarian of the Denver Public Library, had a favourite maxim that should be engraved in stone above the door of every public library building: « The worth of a library is in its use. » To this end, Dana acquired books that people wanted to read, opened the shelves to their direct contact, encouraged the active presence of children, and promoted the library to the community at large.

3. THE DENVER PUBLIC LIBRARY BEFORE 1995

The Denver Public Library learned a great deal about a library building as a machine for service the hard way: by operating for many years in a building that frustrated effective service at every turn. A characteristic International Style building of 1956, it featured a non-monumental limestone, glass, and aluminium exterior and a plain, bare interior with vinyl asphalt tile floors, low acoustical tile ceilings, painted walls, and a minimum of millwork.

Although this style was attractive when the building was new and boring thirty years later, much more important were two basic problems, one of which was predictable: the lack of space. Because of the initial space deficit, the two basement floors were fully devoted to closely packed, built-in closed stacks, not open to the public. This arrangement placed a difficult limitation on the library's « ability to serve customers from the very beginning, for it forced them into a catalogue-and-call-slip style of library use which violated the Denver Public Library »'s own traditions. Closed stacks required a pneumatic tube message system, chain-driven mechanical booklifts, and the employment of staff who initially (at least in the pictures published at the opening of the building) roller skated through the stacks to retrieve books. On upper floors, the open shelves were soon overcrowded too. The entire building exceeded its capacity after only eleven years, in 1967. For decades to follow, this lack of space put a great variety of burdens on the opportunity to provide excellent customer service.

The second, less predictable problem was the rapid technological and operational obsolescence of the building. While no architect of the mid-1950s foresaw the impact of the computer, electrical, and telecommunications requirements of the 1990s and beyond, this building barely met the standards of its own day. Well before the advent of computer terminals, electrical outlets sprouted octopus-like gatherings of extension cords, while telephone cables snaked across ceilings and floors, with staples and tape as favourite means of holding them in place.

The arrival of a few computer terminals in the late 1970s, followed by the onrush of personal computers since the mid-1980s, merely added to the

impediments that the building placed in the way of good service. Inadequate power supplies, spaghetti-like tangles of cables and cords, and the loss of public seating space necessitated by the placement of terminals on tables added to the frustration.

The inadequacies of this situation were so great that service quality and quantity were at serious risk. When combined with the tight budgetary straits of all Denver City government entities in the early 1980s, the building had become a real detriment t o service and a threat to the long-term health of the institution.

4. A TRANSFORMATION

Through an institutional and political reorientation whose full story is outside the scope of this paper, the Denver Public Library secured the opportunity to correct its course. In August 1990, Denver voters approved by a 3-to-1 margin a measure which made available $91.6 million in public funds for a new Central Library and the renovation, expansion, or replacement of 19 branch library buildings. In addition, between 1990 and 1996, generous donors gave $6.6 million in voluntary contributions for capital improvements.

Leaping over events whose retelling would rival the Perils of Pauline, we come to the description of the beautiful machine for service. It opened in two phases: a new building of 404,450 gross square feet (37,800 m) in March 1995; and the 1956 building, completely gutted and renovated, at 133,900 gross square feet (12,500 m), in December 1995.

4.1. Space

The new building has eight occupied floors, seven above ground and one below, and two partial floors, one below ground and one high above, for mechanical equipment. The old building still has four floors above and two below ground. Only two of these six floors align laterally with the floor levels of the new building. The two buildings are joined by ramps and stairs and a complete integration of interior finishes and furniture.

4.2. Circulation (As architects mean it):

Two major public entrances are at the east and west ends of the great three-story hall which forms the backbone of the building. A separate entrance for staff is used only when the public entrances are not open. A below-grade loading ramp, enabling delivery and service vehicles to come directly into the building, supports the arrival of books, supplies, and service personnel. Escalators carry customers and staff from the first to the fourth floors. Four public elevators operate to all public floors, and two service elevators move staff and materials throughout the building. A small shuttle elevator takes passengers down to the below-grade conference room areas.

4.3. Service Points:

The full complex has only eleven service points, which must be staffed when the building is open, eight of which are on the ground floor. Of these eight, two are security checkpoints staffed by guards and one is a directional information desk staffed by trained volunteer docents. Departmental specialization has been kept to a minimum, both to improve customer service and to control the costs of staffing additional service desks.

4.4. Collections:

All of the general interest collections of the building are available on open shelves, and some materials that are kept in closed areas in most libraries are also on open shelves. In the open stack areas on the second and third levels, the entire adult non-fiction collection appears sequentially in Dewey Decimal order. In the second and third level open stacks, there are no fixed service points. Staff, including librarians and shelvers, move about in these areas and offer assistance to customers. Networked computers are deployed throughout these areas so that foot travel around the large building is reduced. On the fourth level, a large portion of the Denver Public Library century-long accumulation of United States Government Publications is presented in open shelves. The challenges of the Superintendent of Documents Classification System and the surprises buried in these publications mean that this is not a very browsable collection, even though it is physically accessible. Some degree of staff assistance is usually required.

4.5. General library services:

On the first level are the desks for Check Out and Return, both near the west entrance, the Children's Library, the Reference Room, and the Burnham Hoyt Room. Check Out and Return perform the functions their names imply, and their back areas serve as the operational centre for the movement of materials in the building.

The Children's Library, strategically located in prime space on the first level of the 1956 building, guides children from birth through the sixth grade into the world of reading and books. Its design is the result of a fruitful collaboration among children, parents, librarians, and talented architects. It is the portion of the building most densely supplied with computers.

The Burnham Hoyt Room, named for the architect of the 1956 building, is located in the remainder of the first level of that building. It serves as a popular browsing library, housing the Central Library's fiction collection, selected new non-fiction, popular paperbacks, videos, and music recordings. A special space for teenagers is located between the Children's Library and the Burnham Hoyt Room, allowing for both physical and intellectual transition.

Also centrally located on the first level is the Reference Room, a two-story circular space which houses about ten thousand core reference

volumes, an ample provision of networked computers supporting electronic information delivery, and a skilled, mobile staff. Both on-site and telephone reference work are performed in this area, with librarians moving back and forth between desk and telephone assignments. When they are on telephone duty, librarians wear cordless portable telephone headsets that are keyed to the main reference telephone numbers. This arrangement allows them to move freely around the large room and into other areas of the building to answer telephone reference questions. It is not unusual to encounter a reference librarian on an escalator, moving up to the open stacks while discussing the question with a telephone customer.

4.6. Specialized services:

On the third level, directly above the Reference Room, is another handsome circular area, which is the home base for periodical services. The Magazine Centre provides about 2500 current subscriptions, including many US and world newspapers, popular magazines, and other periodicals of public interest.

Government Publications and Business Reference services are housed on the fourth level, with an expert staff of specialists.

4.7. Western History and Genealogy.

Western History, a traditional area of special emphasis for the Denver Public Library, has been combined with Genealogy, a relatively new specialization, on the fifth floor of the Central Library. The crossover among the customers who use these two are as for research and the need to control the number of staffed service desks contributed to this decision, which has proved to be very enriching. In this case, a two-sided reference desk, with Western History materials under higher security on one side and genealogy materials and seating on the other, is served by a single integrated staff. \par

4.8. Other spaces:

The rest of the building, from the janitor's closet to the City Librarian's office, exists to support these key service areas and to provide the headquarters functions for the entire library system. In addition, several conference spaces of varying size and character and a dramatic, privately-funded gallery on the seventh level allow for meetings, programs, and social events.

4.9. Space as a service:

One traditional service that the Denver Public Library's Central building supplies in abundance is the provision of space. A customer can sit in a chair and read a book. A group of students can gather to confer. A researcher can spread her materials on a large table. Some space provisions are in busy public settings, while others offer a sense of privacy and quiet. There are over 1100 seats.

All these spaces feature the substantial wooden chairs of the type