SERVICE INNOVATION IN PUBLIC SECTOR  
- A CASE STUDY ON THE NATIONAL LIBRARY BOARD  
By Priscilla Wong and Virginia Cha  

December 2008  

Abstract  
With increasingly high expectation of the quality of public service, in addition to the resource crunch, governments need to respond quickly and creatively in an era of rapid change. By identifying critical factors for successful innovation implementation, this research paper highlights the roles of the relevant National Library Board Acts, and other factors instrumental in transforming a public sector service organisation and how these factors influence innovation and the supporting culture at the NLB. Through a case study on the NLB—which spearheads the transformation of library services in Singapore—the paper highlights the journey of how this public organisation innovates when under limitations. Key to the change process is strong leadership with clear direction, which in turn influenced the commitment and behaviour of the organisation. This put innovation high on the agenda of the organisation and ensured that the right supporting resources were available.  

Beginnings of the National Library  
In Singapore, the National Library has been directly responsible for both the national library and the public library functions since its establishment in 1960. ¹ This was made possible with the National Library Act (NLA) of 1958. Although the NLA 1958 established effective control over the public and national libraries, library services in Singapore were not effectively coordinated and the nation's information resources were not optimised.  

To counter this, the Library 2000 (L2000) Review Committee was established in June 1992 to expand the learning capacity of the nation so as to enhance national competitiveness. After a study by the L2000 committee, the National Library Board (NLB)—along with the National Library Board Act (NLBA)—was set up on 01 September 1995 to lead the formulation of policies, strategies and the relevant implementation of the recommendations of the Library 2000 Report. This set up ensued a world-class library system that would be convenient and useful to the Singapore population. NLB manages a network of libraries, including the Lee Kong Chian Reference Library, three regional libraries, 20 public libraries and the Clementi Community Children's Library.  

In July 2005, the NLB unveiled the Library 2010 (L2010) plan that put forward its strategic direction for the next five years. The L2010 plan focused on expanding the role of libraries in the knowledge economy and to develop knowledge-enabled Singaporeans. The new framework will entail in making information accessible, building knowledge and expertise and sharing and exchanging knowledge. A key challenge is to keep the NLB relevant in the context of the digital revolution.  

¹ In most countries, the national library board is responsible for the national library and its functions. The influence on library development of the country is restricted to library grants provided for library related research, development policies and library technical standards.
L2000 Plan: Six Strategic Thrusts
According to the L2000 Review Committee, the three key enablers crucial in spearheading the six strategic thrusts of the L2000 plan were human resources, technology and organisational leadership.\(^2\)
- Establish an adaptive public library system consisting of a network of national reference libraries, regional and community libraries; assist in the setting up of school libraries and develop specialised libraries for specific sectors.
- Create a network of borderless libraries linking Singapore publicly-funded libraries to overseas libraries and information services through computer networking.
- Put in place a coordinated national collection strategy.
- Quality service through market orientation.
- Create symbiotic linkages with government, business and the public.
- Help shape Singapore into a global knowledge hub offering information on regional business and culture.

Leadership
The first chief executive of the NLB, Dr Christopher Chia, played a vital role in focusing NLB’s functions on flexibility and efficiency. Such a structure boosted staff confidence, introduced improvements, and reduced resistance to change; especially important during the initial phases.

Quality of Human Resource
The NLB has long been recognised as a leading employer, with a ranking in the Human Resource Management Singapore Awards in 2005. Staff morale was boosted with a slight raise, uniforms, and business cards. Communication sessions were also held to educate staff on the organisational changes, with the reassurance that the introduction of information technology (IT) would not make their jobs redundant.
Work Improvement Teams (WITs) and Suggestions Committee, and Quality Service Committee were two sub-committees set up to drive the movement of making changes and innovation a way of life at the NLB. The Quality Service Committee proposed quality service awards. The NLB also provided scholarships for its staff. The National Library Board Institute (NLBI) was set up to conduct short training programs for library professionals at all levels.

Technology
The NLB clinched the National IT Award in 1998, and was also one of the Chief Information Officer’s (CIO) 100 honourees in 2005. The innovative use of technology was a key driver of change,\(^3\) and the NLB had a S$1 billion plan to improve its libraries over seven years from 1997.\(^4\)

In the L2000 plan, the committee identified three pre-requisites that must be put in place. One of the three enablers was by investing in new technology, and the areas of technological deployment were broadly categorised under two systems: data management system (DMS) and information communication technologies system (ICTS).

Under DMS, core data such as library management of the collections and information about its members is stored, processed and managed. ICTS, on the hand, was developed to reach out to targeted audience by processing core data from the DMS that was readily acceptable by the end-users. Technological peripherals were added on to the ICTS, such as Electronic Library Management System (EliMS), Borrowers’ Enquiry Terminals (BNQ) and eLibraryHub.

---

4 NLB Annual Report FY 1997
Electronic Library Management System
The NLB was the first library in the world to deploy the radio-frequency identification (RFID) technology through the Electronic Library Management System (ELiMS). In the late nineties, Singapore-based ST LogiTrack had developed and marketed innovative RFID-based solutions to enhance the productivity and efficiency of specific business processes. The NLB collaborated with ST LogiTrack to develop ELiMS prototype and tested it in February 1998.

The new system facilitated borrowing and automatically cancelled the loan of materials when users returned them to the library via the bookdrop, reducing borrowing queue time from 45 minutes to less than five minutes. The implementation of RFID also opened other application possibilities to the NLB, such as tracking and stock-taking.

On average, most library staff were approached about 150 times per month for assistance. However, RFID enabled the librarian to key in the identification number of the item for its location via an embedded antenna. A maximum of eight titles could be searched at the same time. Stocktaking of books in a shopping mall library used to take up to two weeks, but ELiMS reduced it to a day.

ELiMS was first piloted at the Bukit Batok Community Library in November 1998, and the NLB and ST LogiTrack were awarded an International Certificate of Grant of Patent for the RFID application in 2000. The application was then extended to the entire library network in 2002. ELiMS was estimated to have saved the NLB S$50 million every year, mainly in manpower costs, and helped reach the NLB’s 15-minute book-to-shelf target.

- **Totally Do-It-Yourself library**

  With many automatic services in, the NLB started the DIY library, aimed at providing the same level of service to its users as a library with staff onsite. The Sengkang Community Library was the NLB’s first self-service library. It allowed for long opening hours without additional manpower.

Some of the automated services that were already in place were:

- **Self-service check machines**

  The self-service counter concept, one of the creative ideas developed by the NLB’s staff, eliminated the need for staff to attend to users who wanted to borrow or return books. The implementation of self-service check machines from 3M has made it more convenient for users to borrow books. The average peak waiting time has been reduced from 45 minutes to only 10 minutes, which in turn decreased queuing time and improved customer service. These machines were first prototyped at Tampines Regional Library and Jurong West Community Library before its success prompted the NLB to standardise this feature to all branches.

- **Borrowers’ Enquiry Terminals**

  Borrowers' Enquiry Terminals (BNQs) were self-check machines for users to enquire about their loan status and make payments via cashcards. Their friendly user interfaces also made them convenient and popular among users. They could easily tap their membership or identity cards at the scanner to view their membership status, or insert their cashcards to allow the system to

---

5 NLB Annual Report FY 2002


7 NLB Annual Report FY 1997
automatically clear any outstanding fees. With several of such terminals located at designated areas within library premises, users no longer need to queue at customer service counters but perform queries and make payments anytime.

With all the above functions automated, the library found that two functions—registration of new members and the enquiry service—were the remaining library functions which needed to be automated in order for customers to transact every function on their own without the assistance of library staff.

- **DIY membership registration kiosk**
  
  To prototype the Totally DIY library at SengKang, a kiosk was designed to provide the registration service of new members. Focus groups were brought to the library to test the service before it was opened to the public. Feedback was gathered and improvements were made to the service before it was launched to the public on 1 December 2002 when the library was opened.

  The NLB carefully managed the initial staff uncertainty in its effort to motivate staff commitment and involvement to create the desired staff practices and behaviours. As the culture that the NLB built was one of open communication, teamwork, learning, and autonomy.

  By learning from one another in teams, from the external environment including organisations and users, the NLB enlarged its knowledge base useful for generating innovative ideas. The ability of staff to contribute suggestions highlights the emphasis that the NLB put on its human resource. It believed that good ideas could come from all levels of staff, one of its most valuable resources. Other platforms include the Macro Mechanism Strategic and Corporate Planning, People Development Performance Management Programme and Standardisation Service Standards.

  Technology was an enabler for the NLB. It leveraged on technology to deliver most if its services and supported its purpose to make its library resources convenient and accessible. This was also possible because of an appropriate funding that allowed the NLB to experiment with changes.

  The use of technology also led the NLB to collaborate with many suppliers which possess the required technical capabilities. NLB also outsourced some of its processes to outsiders such as the Singapore Post which transported its books among branches.

  **Knowledge management at the NLB**

  The NLB implemented its knowledge management (KM) initiatives to improve knowledge diffusion in the organisation. Besides improving internal communication channels, the NLB also sought to learn from others through external exchanges. To better serve customers, there were also feedback loops and focus groups where users were encouraged to recommend improvements.

  A value that the NLB embraced is a mindset of continuous learning, improvement and innovation. The NLB started its knowledge management with the commitment of $1.87 million a year. The system would have the collaborative tools and KM services such as profiling, personalisation and search facilities, replacing the old system where most of NLB’s content resides in different repositories in its e-registry. The KM cycle was to get, use, grow and share knowledge,

8 “How NLB plans to make KM work for it”,

4
using a five-tier KM model: strategy, infrastructure, communities. (See Table 1)

<table>
<thead>
<tr>
<th>KM initiative</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus group feedback mechanism</td>
<td>To receive inputs from the population on service level and contribute suggestions on further improvements.</td>
</tr>
<tr>
<td>Library development group</td>
<td>To oversee the planning and setting-up of new libraries.</td>
</tr>
<tr>
<td>Business Process Re-engineering (BPR) unit</td>
<td>To plan and implement new projects and prototype services, and facilitate the process of project management.</td>
</tr>
<tr>
<td>Work Improvement Teams (WITs)</td>
<td>Staff’s suggestion scheme that awards staff monetary rewards for each suggestion rendered.</td>
</tr>
<tr>
<td>Regular fortnightly meetings among the managers of all the public libraries with the directors</td>
<td>To ensure that everyone practices the same standards.</td>
</tr>
<tr>
<td>Formal briefings and communications by the manager of each branch to her branch staff</td>
<td>For staff to be kept informed about new projects.</td>
</tr>
<tr>
<td>Programme Development Group</td>
<td>A coordinating body for all programmes to be hosted at each community libraries to eliminate duplication efforts.</td>
</tr>
<tr>
<td>Ask Stupid Questions (ASQ) practice</td>
<td>To gather feedback and suggestions from staff.</td>
</tr>
</tbody>
</table>

Besides its KM initiatives, in an effort to grow and learn from others, the NLB actively organised and participated in international library meets and conferences such as the International Federation of Library Associations (IFLA).

In 1996, a small group of the NLB managers tackled the library’s most pressing problems, reviewing processes from the customer’s perspective before any IT systems were deployed. The group reviewed and streamlined processes before automating them. The board had to constantly monitor the acceptance and usage of the integrated information resources so that the library services provided would remain relevant to the intended end-users.

Both formal and informal surveys were frequently being commissioned by the NLB to be conducted in public libraries. Feedback was collected from readers about customer trial. This feedback was taken seriously and used as a gauge to measure staff performance and as input for further enhancements and improvements.

The NLB also established a focus group feedback mechanism, which actively recruited individuals from all sectors of the population to give inputs on the current level of service and contribute suggestions on further improvements to be made. It was by constant solicitation of feedback from customers that the NLB could tailor its services and collections to be relevant to the overall population.

**Autonomy**

The legislators of the NLBA had understood that if the NLB’s powers were merely
advisory in all aspects of library work, it would not be able to function effectively as a board that steers library development towards national goals. The NLBA therefore provided the NLB with executive powers, giving the Board greater independence in decision making and more flexibility in administrative matters, such as personnel and finance issues.

The NLB in turn also encouraged its staff to make a difference to the library system. This autonomy also extended to giving them the space to voice their suggestions. The staff suggestions scheme served as a channel for staff to voice their ideas in spite of the bureaucracy. The heads of the divisions could then evaluate and approve the suggestions online. Sixty percent of 2,239 suggestions received in FY97 were implemented. One of these examples was a special card reader that was implemented to replace the tedious and time-consuming process of rectifying errors on users’ prepaid account updates. This idea has helped the NLB to reduce costs, increase staff productivity and improve service.

Teams and Diversity
One of the resources for innovation stated in the NLB Annual Report FY00 was a project-centric environment where cross-functional project teams existed. Project management methodology was implemented to facilitate collaboration across. Another example is the Work Improvement Team Scheme (WITS).

Modernising the NLB also meant that the organisation had to bring in fresh talent for new areas where skills were not available within. For instance, external IT competencies and skills were brought in to supplement the competencies of library staff and to help the NLB exploit IT fully in their service delivery and applications. Hence, besides librarians who formed the foundation of the organisation, the NLB was an open market for professionals with backgrounds such as IT and marketing.

Risk management
The process of introducing a new service to the public had always been to prototype and pilot at a library, then rolling it out to other libraries if it was successful with its patrons. However, with new constraints on budget, the Proof-Of-Concept (POC) stage was introduced in the innovation process.

When the idea was large, the NLB had to produce concept papers before the idea was implemented as a prototype at a library. Due to the elaborate and tedious management of these risks, and the existing tighter budget constraints, the NLB recently introduced the POC stage, which would take about three to six months to complete, just before the prototype stage. The idea would be broken down into smaller parts to be tested for their viability. Under these circumstances, the NLB could have its experiments under control and test only the concept of the service itself. It did not have to involve policy issues, such as the number of books users could borrow under the new service.

Measurement and Benchmarks
The NLB was constantly reviewing existing services and facilities with the aim of improving them. It constantly monitored the acceptance and usage of the integrated information resources, so that the library services provided would remain relevant to the intended end-users.

The NLB also introduced its Service Standards in 1999 to set new targets in operations and customer service for all branches. Service standards were documented in a concise format for clearer communications to all staff. To reinforce its commitment to customer service, 67 service standards were established in five categories:

---

9 NLB Annual report FY 1997
customer service, printed collections, housekeeping, programs, and staffing and administration.

Collaboration
Collaborative links with local and international organisations were a necessity for the NLB. It has developed partnerships and alliances with institutions worldwide to aggregate world-class knowledge, content, experience, and databases. This also streamlined its own management practices, so that the delivery of information services to its various publics would be efficient.

For instance, One Learning Place was set up when the NLB took an initiative in 1999 to promote mass awareness and widespread adoption of network resources like Singapore ONE. To make books available to all patrons, books were physically shipped among the branches by request within 24 hours. The NLB did this by outsourcing book transportation to Singapore Post, where about 300,000 books were transferred among branches every month.10 In 1997, the NLB developed a partnership with Singapore Technologies LogiTrack Pte Ltd (STLT) to prototype an innovative system to improve control over the movement of library materials.

The NLB also worked closely with several media channels in Singapore to feature its services. Through these channels, the NLB introduce new and innovative services, and conducted book and program reviews. The NLB also partnered with professional, business and arts communities, schools and grassroots organisations, so that flows of knowledge, expertise and goodwill could encourage the spirit of learning.

Through innovative strategies and partnerships, the NLB was able to maintain a balance in fulfilling its social responsibilities as a public library authority, and to demonstrate its role as an information agency.

Contributions to innovations at the NLB
The factors that contributed to new ideas in the NLB are summarised in Table 2.

- “Ask Stupid Questions” forum
At “Ask Stupid Questions (ASQ)” forums, ideas and knowledge that were shared among the NLB’s staff. These may be developed into possible business. These forums, started in August 2000, were first initiated by a group of librarians because it was believed that the best ideas often come from trivial questions.

- Aspiration Pathfinder
The Aspiration Pathfinder (AsPI) was an innovative project that addressed participants’ personal and professional challenges by changing the way they see, think and feel. It put together opportunities that would develop each individual to a person he wanted to be. Because it has helped participants to step into new territories and explore new possibilities, it has enabled the NLB to develop new products and offer innovative services.

- Business Process Re-engineering
A team of staff solely dedicated to planning and implementing new projects and prototype services was set up to facilitate the process of project management. The Business Process Re-engineering (BPR) unit at the NLB’s headquarters looked into how current practices could be improved on and how the most efficient methods of performing a service could be rolled out.

The main objective was to develop a set of integrated designs and strategies for the NLB to manage its fast expanding network of libraries for the 21st century. New mechanisms for service delivery,

---

leveraging on technological and process innovations, needed to be devised to serve the future needs of library users.

Participants were required to identify, analyse and redesign the NLB’s core business processes to remove redundancies in library planning and development, collection development, library operations and information services.

As a result, there were significant improvements to existing workflows, such as books could be acquired more quickly to keep the collections current, books could be shelved and checked out faster, and the library infrastructure was upgraded.

NLB’s eLibraryHub
The NLB exploited technology to deliver knowledge resources efficiently and conveniently to its users. It collaborated with the NCS to integrate around ten types of its services into one system, the eLibraryHub (eLH).

The eLH was the NLB’s one-stop information portal that complemented its existing network of more than sixty physical libraries. It was launched in 2001 as a one-stop integrated library that allowed immediate access to information resources around the world. Through the services provided by the eLibraryHub, customers could access to up-to-date information services. Significant savings in time and manpower also allowed the NLB’s staff to provide more personalised value added services to the customers.

Features of eLibraryHub include:
- Digital Library
  The Digital Library, which leveraged on the broadband Singapore ONE network, featured library catalogues and databases.

Table 2: Categorisation of the NLB’s innovations

<table>
<thead>
<tr>
<th>Product Innovations</th>
<th>Development of a new concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Ask, Digital Question&quot; forum</td>
<td>Trivial questions can spark the best ideas.</td>
</tr>
<tr>
<td>Acquisition Pathfinder</td>
<td>Develop new paradigms that result in new breakthroughs through engaging participants through a series of unusual learning experiences.</td>
</tr>
<tr>
<td>Business Process Re-engineering</td>
<td>Examined current practices and the most efficient methods of performing a service.</td>
</tr>
<tr>
<td>Digital Library</td>
<td>New access to e-books, online databases and reference resources.</td>
</tr>
<tr>
<td>Shopping mall libraries</td>
<td>Specialised public libraries in shopping malls.</td>
</tr>
<tr>
<td>Mobile Service via Short Message Services</td>
<td>Existing users could manage their library accounts in a more convenient way.</td>
</tr>
<tr>
<td>Electronic Library Management System</td>
<td>Facilitated borrowing and automatically cancelled the loan of materials and its in tracking, sorting and stock-taking of library items.</td>
</tr>
<tr>
<td>Self-service check machines</td>
<td>Users could borrow or return books quicker.</td>
</tr>
<tr>
<td>Borrowers’ Enquiry Terminals</td>
<td>Users can perform queries and make payments more conveniently.</td>
</tr>
<tr>
<td>DIY membership registration kiosk</td>
<td>Registration service automated.</td>
</tr>
<tr>
<td>Radical - Fundamentally new to the organisation.</td>
<td>Aragon Pathfinder</td>
</tr>
<tr>
<td>Evolutionary innovation - New service for old users.</td>
<td>Digital Library</td>
</tr>
<tr>
<td>Developmental innovation - Existing service is improved for existing users.</td>
<td>Shopping mall libraries</td>
</tr>
<tr>
<td>Mobile Services via Short Message Services</td>
<td>Electronic Library Management System.</td>
</tr>
<tr>
<td>Self-service check machines</td>
<td>Total - New service to attract new users.</td>
</tr>
<tr>
<td>Borrowers’ Enquiry Terminals</td>
<td>Shopping mall libraries</td>
</tr>
<tr>
<td>DIY membership registration kiosk</td>
<td>Shopping mall libraries</td>
</tr>
</tbody>
</table>
necessity to keep up with the Internet as an emerging tool for communication among the masses.

The website functions was as a one-stop centre, allowing users to also pay fees and fines, inquire about reference material, and have videos and CD-ROMs streamed to their desktops all through a single point of entry. All these online services had been designed to cater to users from various backgrounds – individuals, businesses, professionals, corporate and community groups.

- **Mobile Service via Short Message Service**

Increasingly, more people in Singapore use short messaging service (SMS) as a common means of communication. The NLB tapped on this channel to deliver better services to its users. The Mobile Service via SMS, launched in October 2001, was a collaboration with mPayment Pte Ltd and StarHub Ltd. It allowed users to manage their library accounts anytime and anywhere via SMS. They could check their loan records, renew their books, pay library payments via pre-paid, and get alerts to return library items before the due-date.

**Shopping mall libraries**

Due to the lack of space, together with its vision to “bring the library to the people” the NLB started setting up libraries in shopping malls. **library@orchard** was the sixth the NLB library to be set up in a mall.

- **library@orchard**

The Singapore Government conducted a National Reading Survey on library use in 1998 and found that the young people in the age group of 18 to 35 stopped visiting the libraries after leaving school. The NLB targeted these potential users with the concept of a lifestyle library that would be a trendy place for young people “to keep them coming back for more.”

**library@orchard**, which launched in 1999, turned out to be very successful and paved the way for more innovations, such as the **music@orchard** series of programs that had rap artistes and rock bands entertaining huge crowds. Other innovations included **comics@orchard** where comics went on loan in Singapore’s public libraries for the first time; as well as **IT@orchard** and **wellness@orchard**, each emphasising a subject appealing to the young people. This niche library also led the NLB to set up Singapore’s first public performing arts library – the **library@esplanade**.

- **library@esplanade**

**library@esplanade** was launched in 2002. At **library@esplanade**, classical music issued from a ‘self-playing grand piano’. A gallery occupied a centre stage, and for CD listening, the library installed car radios.

The layout of the library adopted the metaphor of a village such that there were four clusters or “villages” of Music, Dance, Theatre and Film, creating an environment that supported creativity, learning and entertainment for the layperson and for the professional artiste. The NLB engaged the arts community to provide ideas for the look and feel of the library, and for the materials that went onto the shelves. It also gained ideas from state-of-the-art libraries overseas, such as programs like a drum clinic and an evening of songs with local personalities.

**Conclusion**

Unlike most public services that have been a monopolistic provider of many public goods and services, the NLB faces stiff competition from other information providers such as bookstores and the Internet.

What makes the NLB different from most public organisations is also its work-life
balance program for its staff in addition to its focus to upgrade staff skill levels. The success of this program has improved service levels and decreased staff turnover rate.

Another noteworthy point is the nature of a typical civil vocation under which the NLB was set up. Most of the staff then was unwilling to forsake their ‘iron rice-bowl’, and would go through changes with the organisation. This adds on to the uniqueness of this case study.

This paper also illustrates that key to the successful transformation of the NLB is the role of leadership. The NLB’s first chief instituted important methodologies appropriately to prepare the organization for massive changes. These included a change in internal processes using business process re-engineering and a project-centric environment. An open culture that encouraged staff to try new things was also important.

For a public organisation, attention should be paid to foster commitment from all levels of staff. To encourage continuous search for solutions, the NLB allowed for sufficient staff autonomy. Allowing all levels of staff to participate in creating and implementing organisational changes is a form of empowerment that is able to foster commitment.

A well-balanced mix of talent within the organisation, with ideas coming from not only the top management, is also important. Communication channels between different units in a public organisation are also particularly important in ensuring that good ideas are diffused across the organisation. Finally, risk was well-managed at the NLB. Where the risk involved in making changes can be managed well, public organisations would be able to gradually detach itself from the risk-adverse image.