

My Tree House – World’s 1st Green Library for Kids

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Abstract:

The National Library Board, Singapore (NLB) and City Developments Limited (CDL) unveiled the World’s 1st Green Library for Kids named “My Tree House” on 31 May 2013. This green library is housed at the Central Public Library (CTPL) located within the National Library Building in Singapore. It is steered by green principles in all facets from design, infrastructure and use of sustainable materials, to collections and programming. “My Tree House” is a unique green library purposefully conceptualised, constructed and operated with environmental sustainability in mind. CDL provided green expertise from its experience of developing eco-friendly properties and integrated sustainable practices to create a green prototype library for kids. The library was designed to create an enchanted forest ambience with fun spaces for hands-on learning and reflections. “My Tree House” takes its name after the centrepiece which is a tree house structure constructed with recyclable materials. It is to evoke the feeling of a special place for children as featured in story books. The components comprise, but are not limited to, aluminium cans, plastic bottles and some fibreglass. Low VOC (which stands for Low Volatile Compound) paints and adhesives were used on the walls; and the manufactured carpet tiles are greenhousegas-free, containing up to 70 percent recyclable materials with no glue required for installation. Energy-efficient LED lighting, which enhances user comfort with less overhead glare, requires less maintenance and has a greener manufacturing process, is used throughout the library. The library is now home to 45,000 books. Existing bookshelves were re-used and revamped by adding some exciting forms and features using boards, also recyclable. About 30 percent of these books focus on green topics such as animals, plants, nature, water resources, environment and climate change. NLB has also worked with other public agencies in developing the library’s collection and using the library for environmental education and outreach. A wide range of tailored activities like games, storytelling and craft-making to spur interest in children ages 4 to 12 are available.

Keywords: Green Library, Kids, Children, Environment, Recycle.

1. Introduction

The National Library Board (NLB) has embarked on a synergistic collaboration with City Developments Limited (CDL¹), to build the world's first green library for children at the Central Public Library (CTPL). This is a 3P (Public-Private-People) project between a public organisation (i.e. NLB) and a private company (i.e. CDL) to give to the people a library for children. The objective of starting a children's green library is to inculcate from young a generation of green library users who will become Environmentally Literate adults.

CDL has renovated, retrofitted and refurbished the Children's Section of CTPL to be renamed "My Tree House" while NLB worked on the collection, services and programmes for the library. The launch of the "My Tree House" was held on 31 May 2013 to tie in with CDL's 50th anniversary as well as showcasing it at the International Federation of Library Associations (IFLA) World Library Conference held in Singapore in August 2013.

The team has taken a holistic approach towards setting up a children's green library, encompassing infrastructure, services and programmes. Hence, this collaborated implementation of a children's green library between CDL and NLB is a breakthrough; "My Tree House" will be the pioneer official green children library in Singapore and the world. The library concept will stand as the first children's library to focus on Environmental Literacy with physical green features and is a physical testament to the innovation of NLB and CDL.

"My Tree House" has also won the Building Construction Authority Green Mark Platinum Award, Singapore in May 2013.

"Libraries are integral to our efforts to educate the public, especially the young, on importance of sustainability in the built environment due to their pedagogical role in serving the community. As a central space for knowledge sharing, My Tree House is uniquely placed to educate children on the importance of sustainability. The extensive use of green materials, energy-efficient fittings and innovative teaching features were factors which garnered the project the BCA Green Mark Platinum Award. Indeed, the overall green concept was well conceived and executed. I am heartened by CDL and NLB's commitment to promoting sustainable development and have no doubt that My Tree House will inculcate in the kids and their parents alike a sense of eco-consciousness," said Dr John Keung, Chief Executive Officer of the Building and Construction Authority.

¹ As Singapore's property pioneer for almost five decades, CDL is a listed international property and hotel conglomerate. In Singapore, CDL holds a track record of some 22,000 luxurious and quality homes and is also one of the largest landlords. The Company has been leading the development of Green Building in Singapore through innovation since the 1990s. As a green developer and Eco-Champion, CDL is well recognised locally and globally as a corporate beacon in sustainability. It is the first Singapore corporation to be listed on all three of the world's top sustainability benchmarks: FTSE4Good Index Series (since 2002), the Global 100 Most Sustainable Corporations in the World (three consecutive years since 2010) and the Dow Jones Sustainability Indexes (World & Asia Pacific – since 2011). In advocating Corporate Social Responsibility (CSR) and its commitment to environmental sustainability, CDL focuses on engaging its stakeholders and the wider community through various platforms – including cultivating social and environmental consciousness amongst the next generation.

2. Objective

The objective of “My Tree House” in inculcating the green concept in children is in line with CTPL’s vision of being a lifestyle library situated in the Arts and Heritage District of Singapore. Recognised for its well-established Fiction collection, CTPL has continuously strived to promote the concepts of Art and Design, which are efforts made in hope of being able to provide to the public the experience of a lifestyle library. Faithfully, in line with this vision of CTPL, the development of “My Tree House” will create awareness and subsequently nurture children into green teenagers and adults with a love, understanding of and appreciation for the green lifestyle. In addition, when the momentum to learn about and be aware of the green concept starts from young, it builds the basic foundation for green concepts to be incorporated continuously by choice throughout a child’s life. In addition, the library has the latest architectural green features and sustainability technologies, which is in accordance with the Arts and Design theme of CTPL.

The most important objective of building a green children’s library is the introduction of Environmental Literacy. Environmental Literacy refers to the knowledge of pro-environment practices and turning these into behaviour. Measurable gains from Environmental Literacy education will be Green practices such as recycling, energy conservation and nature preservation. In order to achieve this objective, a two-pronged approach is adopted - the Infrastructure ‘hardware’ and Service ‘software’. Through incorporating the green concept in both the ‘hardware’ and software’, “My Tree House” aims to inculcate a strong sense of awareness, understanding and appreciation in the children for the environment and the world around them.

The ‘hardware’ refers to the infrastructure of the “CDL Green Children’s Library”. These are the physical things the children see and interact with using their five senses. The key design features of “My Tree House” enable the children to experience the environment through their different senses, while still being in the physical space of the library. This is to educate and thus stimulate curiosity leading to self-directed learning of environmental issues. Hence, the physical structure of “My Tree House” is planned meticulously with strong adherence to the objectives of this whole project. The library is built with the main aim of being the only possible place for children to enjoy such sensuous experiences as information is made accessible easily and remotely via cyber space.

The ‘software’ refers to the sustainable collection, services and programmes which “My Tree House” offers for the children. Efforts in developing the ‘software’ of the green children’s library include developing a collection that is in sync with and promote the objectives and aims of the green children’s library to the target audience, providing services and programmes curated to promote the green concept to children. Collaboration with schools and organisations that are keen on green efforts will also be discussed further in this article.

In addition to developing the ‘hardware’ and ‘software’, the library environment such as air quality, lighting, humidity control and energy efficiency features, as well as using green construction materials are used to make the physical space a real “Green” space.

3. Theme

The theme of the library is “Enchanted Forest in the City”. Forests, being the salient imagery related to the concept of Green and Eco-friendliness, are appropriate as the main pillar of the

first Green Children's Library. Coupled with our region's perennial battle with deforestation and forest fires, the concept of Forests is more familiar to children, as compared to concepts of climate change, such as the La Nina effect that are more pronounced in regions with the four seasons.

Furthermore, the symbol of the Enchanted Forest appears frequently in children's fairytales (e.g. 'The Enchanted Wood', 'The Magic Faraway Tree' and 'The Folk of the Faraway Tree' by Enid Blyton, 'The Enchanted Forest' by Jodel Abrams), lending a cohesive lead from books to real life, situating the library's role as knowledge and service provider. The pervasiveness of magic forests in Children's Literature implies ease in providing related services (e.g. thematic storytelling and book displays).

However, the concept is a modern twist on the Enchanted Forest. Apart from being eco-friendly, it is more timely to be eco-chic. Being eco-chic also enables users to form a bridge between what is Ideal (Virgin Forests) and what is Current (City Comfort). For our target users (children ages 4 to 12), the library offers an experience that takes them outdoors while being indoors.

4. Infrastructure

CDL has sponsored the design and building of the 'My Tree House' based on the agreed theme and concept provided by NLB. This includes engaging their architects, interior designers, engineers, consultants, with their vast experience, to retrofit the existing Children's Section within CTPL into a Green Library for Kids. The team has used recycled materials and looked into ways to improve elements of the environment such as air quality, lighting, energy and utilities efficiency. They have also ensured that the library has eco-friendly properties and integrates comprehensive sustainable practices to create a green library. The eco-directive set for this innovative first-of-its-kind project ensures that every detail from the holistic conceptual design and infrastructure, materials used in the construction, incorporation of innovative key features, are not only sustainable but also proactively reinforce the overall green concept. As such, CDL has brought together green experts and other like-minded corporations, who are leading green players in their own fields, to lend their expertise and support in this initiative.

The development led by ADDP Architects LLP² as the design consultant headed by Mr Tang Kok Thye, who was also awarded Green Architect of the Year 2012 by the Building and Construction Authority (BCA) of Singapore, together with ADDP's Principal Interior Designer, Elsie Chin. In addition, CDL brought in Interface, the world's largest manufacturer of sustainable carpet tiles, to provide the carpeting for this library. As the leader, Interface is widely recognised as the pioneer in sustainability globally. Interface's commitment to the environment is embedded within the company's philosophy based on recycling existing carpets and turning them into new products with green attributes and aesthetics. The carpets are made with up to 70% recycled content. Interface uses the lifecycle assessment (LCA) as a

² Founded in 1986, ADDP Architects is a Singapore based multi-faceted architectural practice with accomplishments of an international profile that offers a comprehensive scope of services including architectural and interior design, project administration and master planning. It is one of the first architectural firms to be certified ISO 14001 – Environmental Management System in Year 2005 as the Management is committed to green and sustainable building design. ADDP has been awarded the BCA Built Environment Leadership Award (Gold Class Award Winner) in Year 2011 and also the BCI Asia Top 10 Architectural firms in Singapore for Year 2005 to 2012.

tool to evaluate and improve the environmental performance of its products. The LCA also forms the basis for sustainable carpet certifications like the NSF140.

Royal Philips Electronics is the lighting consultant and supplier of energy-efficient lighting solutions and fittings for “My Tree House”. The company is a market leader in energy efficient lighting solutions and new lighting applications.

One of the pivotal reasons the green library is housed at the Central Public Library located within the National Library Building is because the building first received the Green Mark Platinum Award in April 2005 and subsequently in March 2009. This is the highest honour for green buildings in Singapore bestowed by the BCA. In July 2007, it also won the first prize in the ASEAN Energy Efficiency Awards under the “New and Existing Building” category. In May 2007, the Building was given the Silver Award in the Universal Design Award from BCA, for its wide spaces, good lighting, accessibility and clarity in way finding.

All the collaborators, together with NLB and CDL, have worked hand in hand to create an enchanted forest ambience with fun spaces for hands-on learning and reflections in the library. “My Tree House” takes its name aptly after the centrepiece which is a tree house structure constructed with recyclable materials. This is to evoke the feeling of a special place for children as featured in story books.

The design concept is based on Roots: Reading, Observing, Optimising interactive space and senses, Teaching and Sustainability. The concept of roots symbolises a deep ROOTED foundation which reflects the structure of a growing young mind shooting to its maximum potential growth. This was inspired by the developmental growth of trees, which must take root in a solid foundation. The seed sprouts into a fragile shoot that must be well nurtured in order for it to mature into a fully-grown tree. A deeply “rooted” foundation constructs the structure of a growing young mind, while the “shooting” process reflects the cultivation to its maximum potential growth. This figuratively symbolises the development of a child’s brain which holds the key to the child’s future and brain stimulation is critical to help a child develop and nourish his or her potential. With these in mind, revamping the NLB’s Children’s section into a green education centre is a perfect medium to get the environmental message across to children and adults alike. The main intent of the design concept is to create an enchanting and magical green space, to entice the children and make reading and learning about the environment fun, interactive and enjoyable.

Aptly named “My Tree House”, there are two key features in the library. The first one is the “enchanted forest entrance” where one feels like you are entering into a magical forest. Please refer to Figure 1 below for the artist’s impression and the final entrance in Figure 2. The second focal point is the “tree house” itself that is strategically located at the centre of the area. This can be seen in Figure 3. The canopy of the tree house centrepiece is built and installed with over 3,000 recycled plastic bottles collected from the public, schools and visitors to shopping mall. A total of 5,000 recycled plastic bottles and cans were collected in total from November 2012 to January 2013. The tree house has a mezzanine level constructed in the middle as the highlight.



Figure 1: An Enchanting and Magical Entrance to “My Tree House” (Artist’s impression)



Figure 2: Final Entrance to “My Tree House”



Figure 3: My Tree House

“My Tree House”, from ceiling to floor, is created using eco-friendly materials. LED lighting, which is more energy-efficient, enhances user comfort with less overhead glare, requires less maintenance and a greener product to manufacture, are also used throughout the library. Low VOC (Low Volatile Compound) paints and adhesives are used on the walls. Existing bookshelves, are re-used and revamped by adding some exciting forms and features using boards, also with recyclable content (see Figure 4). The carpet has been specially chosen because of its green properties. The manufactured carpet tile is Greenhouse Gas-free, composing of up to 70% recyclable materials. Furthermore, no glue is required for its installation. Other eco-friendly building materials such as eco-resins, recycled plastics, fibreglass are used over the design development stage to achieve a holistic green approach in the creation of the Green Library. The artist’s impression of the design can be seen in figure 5 below.



Figure 4: Existing bookshelves recycled with new forms



Figure 5: Interior of “My Tree House” – An Integrated Green Design Concept (Artist’s impression)

The library is divided into the Active and Passive zones. The Active zone contains interactive features such as the Green Activity Areas, Stage, Handicrafts Display and the Shadow Play Wall. The Passive zone contains primarily the collection for quiet reading, e-Reading kiosks and section. The Green Activity Areas is a space with modular furniture to allow flexibility of usage for librarians and partners for specific programmes such as handicrafts. Their products or results will be displayed at the Handicraft Display Section. The stage would be used for storytelling, performances and events for children by children.

An exciting feature of the Active Zone is one of the two key innovative installations, namely the Knowledge Tree. The installation is an interactive projection where children interact by touching the image with their shadows. The wall projection creates a dynamic image of a mystical forest, which from time to time, sprouts new plants and fruits. By touching the fruits, the children would be asked a simple question. If they answer it correctly, the plant will grow, otherwise it will wilt. The projection programme is meant to be ambient in nature, enhancing the environment of the reading room, while subtly providing an interactive and educational eco-experience. The installation is implemented by means of an overhead projection fixed with an IR camera at the designated shadow play wall. Figure 6 shows the service.



Figure 6: The Knowledge Tree

Besides the Knowledge Tree, the other key innovative installation is the Weather Stump. It is a concept based on the scientific method of determining the age of a tree. The concept is to have an interactive installation of the "age-rings" of a tree. These rings are formed in reaction to the environment of Singapore, for instance, the temperature, rainfall and wind speed. Each minute of the weather is recorded in this Dendro-graphic ring in real time. The Weather Stump helps to bring across the eco-message and serves as a constant reminder that whatever we do, there is an environmental impact which is faithfully recorded by Nature. This installation is implemented through a projection within the 'Tree House' area on a tree-stump. The tree-stump can be a seating area for story-tellers during events (see Figure 7). Environmental data is collected with devices in real-time from the Meteorological Services Singapore for the Marina Barrage area.



Figure 7: The Weather Stump

5. Collection

The initial children's collection at CTPL comprises only Fiction books in line with CTPL's service concept of a lifestyle library with special focus on the literary arts. The existing collection size of 70,000 books is scaled down to 45,000 due to the re-design of the space to have more flexible space usage and emerging trend of more eBooks and digital resources.

In order to complement the branding as a Green Library for Kids, non-fiction material related to the Environment, Nature, Weather & Climate Change, Recycling and Plants is incorporated into the collection. It is proposed that these books comprise 30% of the total Children's collection, with equal proportions of J(Junior) and JP (Junior Pictures) books. The collection comprises approximately Non-fiction (15,000) and fiction (30,000) books in all 4 languages for children aged 0-12. The breakdown is as follows:

	English	Chinese	Malay	Tamil	Total
J Fiction	6,000	3,000	600	450	10,050
J Non-fiction	4,500	2,500	300	250	7,550
JS Fiction	9,000	0	0	0	9,000
JP Fiction	3,900	6,000	600	450	10,950
JP Non-fiction	4,500	2,500	300	250	7,550
	27,900	14,000	1,800	1,400	45,100

Table 1: Collection Breakdown

Based on the Dewey Decimal Classification (DDC) classification system, non-fiction books are selected from the following categories and corresponding DDC numbers:

Animals	597.8-636
Environment	333.7
Plants	581
Pollution	363.73, 574.52, 615.902
Recycling	363.72
Water	553
Weather	551.6

Table 2: Subject breakdown based on DDC classifications

The collection is built by drawing existing books from the other 23 Public Library branches in Singapore that have children's collections. Subsequently, the refresh of this collection is incorporated into CTPL's Fiscal Year 13 consolidated Collection Requirements to the Resource Discovery Management department of NLB.

The collection also comprises Children's Fiction with a special focus on Fairytale and Folklore, as these are closely related to the fantastical element of an Enchanted Forest, as well as books related to animals, plants and the environment. Examples of these titles include 'The Barefoot Book of Earth Tales' by Dawn Casey, 'Michael Recycle' by Ellie Bethel, and 'The Last Polar Bear' by Jean Craighead George.

6. Services

Three new services will be pioneered along with the library interior design and features. They are the InfoBits Packages, Customized Library Tour, and Eco e-Reading.

InfoBits Packages

To promote non-linear learning, information bits (InfoBits) relating to all things Green and the environment are to be displayed in the library in both an interactive and static manner. For the interactive, Infobits are to be incorporated into the digital features – the Knowledge Tree. In these digital features, the children can pick up information on green living and the environment through play and interaction. Special collaterals for the library are also developed. These take-home information packages include the tips that were featured in the interactive features, as well as simple activities (e.g. box making) to enhance learning. A

continuous series is proposed to be developed, refreshed every quarter. This take-home Infobit package will tie in with the Earth Hero programme that will be discussed later.

Customized Library Tours

Due to the multitude of new features in the library, customized library tour sessions have been designed for school visits and regular public visits. The special tour sessions include an introduction to the key features of the library, tips on environmentally-friendly practices and short activity session based on the abovementioned take-home information packages. For school visits, additional storytelling sessions are to be included.

Eco eReading

The Eco e-Reading service encompasses (i) providing e-book content in the library and (ii) promoting e-reading as an eco-friendly practice.

The target audience are digital natives who likely prefer interaction with an electronic devices over books. By providing digital devices for e-reading in the Children's Library, we will attract this group of users to visit the library, and also promote the library's digital collection. Permanent e-reading kiosks are part of the design of the Children's Library, rather than the loaning of e-devices. E-reading shall be promoted as an eco-friendly practice, particularly with the sharing of e-devices and high volume of use of our e-books (Figure 8).



Figure 8: Children at eReading Kiosks

7. Programmes

The main programme highlights for the Green Library for Kids are user education, and hands-on activities. Special Storytelling Sessions are to be held once a month (every second Saturday), under the tree at the library. After the half-hour storytelling session, a craft or hands-on session using recycled material will follow. These sessions are designed and conducted by librarians. See Figure 9.



Figure 9: Librarian telling Green Stories at My Tree House

NLB is working with other public agencies such as the Ministry of the Environment and Water Resources, National Climate Change Secretariat, National Environment Agency, National Parks Board and PUB, Singapore's National Water Agency in developing the library's collection and on using the library for environmental education and outreach.

To encourage return visits and participation in our programmes and services, an overarching loyalty programme has been designed, called the Earth Hero programme. For children aged 4-12 years old, the programme aims to engage these children through a variety of activities including attending green-themed programme, attending stories and crafts sessions, contributing artwork and book reviews, and demonstrating environmental awareness. Upon completion of the programme, participant children shall be awarded the title of Earth Hero. Earth Heroes will ideally be ambassadors of the environment and be environmentally literate.

Pre-launch Green Mascot Design Voting Campaign

A pre-launch Green Mascot Design Campaign was opened to all primary schools and pre-schools in Singapore inviting students to vote for their favourite mascot for the Children's Library to be used for promotional and communicative purpose. The voting was held in February 2013, with the mascot officially launched at the official Launch Party on 31 May 2013. See Figure 10 on the Mascots for the Library. A total of 5,406 votes were garnered from the school children.



Figure 10: Mascots for voting

The Mascot Campaign is not only an opportunity to engage our community of target audience, but also increase awareness of the library services and programmes that are offered. The list of services and programmes will be communicated to the schools, and teachers will be invited to pre-book guided tours and storytelling sessions for the students.

The Squirrel won 34.94% of all the votes, double of all the other 4 mascots. Voters also gave feedback that the Squirrel should be a local Singapore squirrel, hence strips were added to the mascot to localize it. See Figure 11 for the revised mascot.



Figure 11: Revised Mascot

With the opening of the Green Library, the team hopes that the library can live up to its objective and groom more children to be green champions in the future.