



TRANSFORMING LIBRARY ENGAGEMENT THROUGH EXPERIENTIAL AND INTERACTIVE AI TECHNOLOGIES

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INTRODUCTION

- Project Manager in the Innovation & Digital Media department within NLB's Technology Services Group
- Our team is responsible for the management and curation of innovative services and proof-of-concept projects, while overseeing the development of features for these services
- Key portfolios include NLB's AI-powered services: StoryGen and one of the iterations of ChatBook



DIGITAL TRANSFORMATION IN OUR LIBRARIES

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Beyond Books

Traditionally, libraries have served as community spaces where people borrow books and conduct research.

Today, our libraries function as centres for learning and technological exploration.

These encompass online programmes, AR and VR services, 3D printing workshops, immersive exhibitions, interactive displays, and much more.

Embracing Change

Technology has evolved so rapidly that we needed to adapt to this change.

How do we apply this technology within our programmes and services to improve the lives of both the public and our staff?

With the current boom in AI, how can we leverage it to improve productivity, enhance the public's experience, ensure safety, and raise awareness of its potential risks?

Serving People

As with all public agencies, our core goal is to serve the people.

To achieve this, we must remain relevant and keep pace with the times in order to draw people into our spaces.

How can we utilise AI technologies to enhance experiences and engage more effectively with our patrons?

FOSTERING CREATIVE LITERACY THROUGH AI STORYTELLING

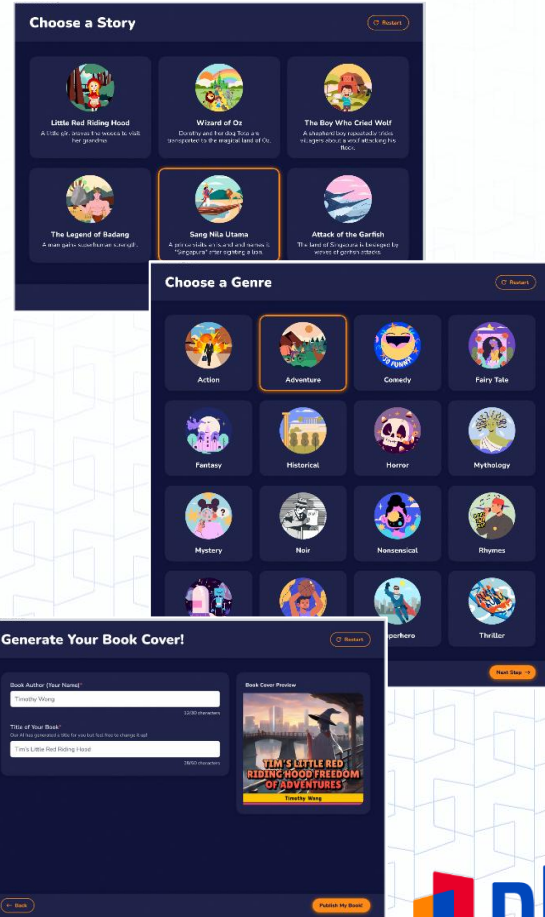
STORYGEN



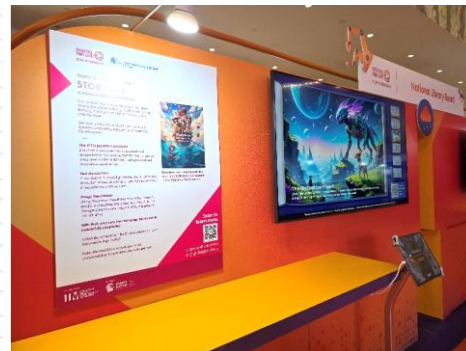
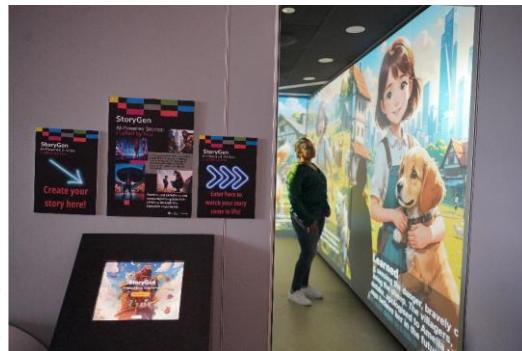
- First launched in 2024, StoryGen is an AI-powered service that enables patrons to rewrite classic tales from the public domain, such as Little Red Riding Hood, The Boy Who Cried Wolf, and the Malay Annals, and watch them visualised on a large screen with immersive music in a variety of art styles
- As one of the first AI services offered by NLB, the service was positioned as an interactive educational tool for fostering creative literacy and raising awareness about the outputs of Generative AI
- Today, StoryGen is deployed in schools, at partner events, and within NLB's pop-up libraries

USER JOURNEY

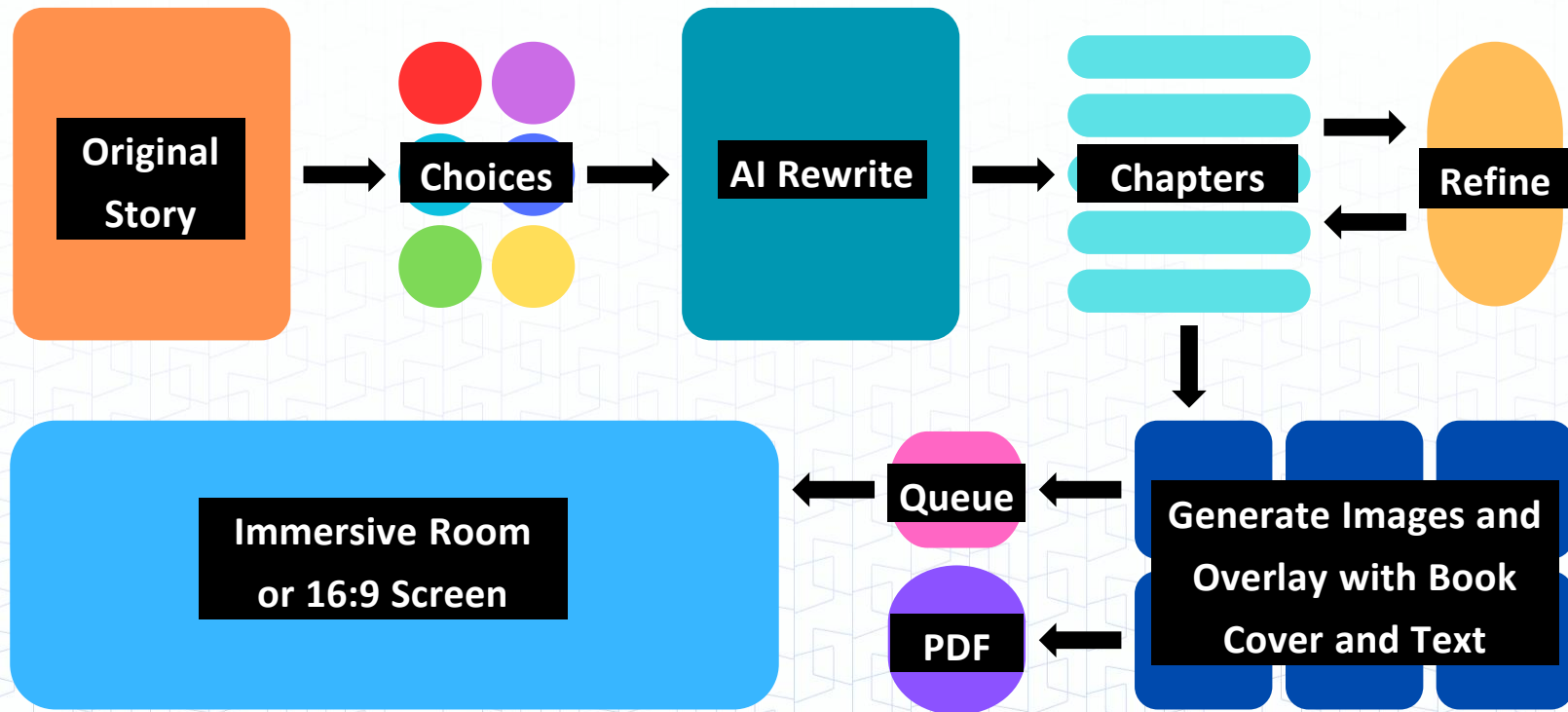
- To rewrite the story, users navigate through a series of selections: choosing a base story, genre, location, main and side characters, and an ending
- These choices inform the AI how they would like to transform the original story
- A preview of the story is shown to the user, and they can choose to refine the story further or proceed to the next step
- Images are generated, and users then input their name and story title
- The generated story is then displayed on screen



DISPLAY SHOWCASE



HOW IT WORKS



ITERATIVE ENHANCEMENTS

Phase 1



16:9 Display Screen



Custom Theme

Phase 2



Admin Portal



Dynamic QR



Mobile Interface

ENSURING SAFE AI FOR CHILDREN

As the service's primary target audience is children, it was crucial that we make the experience both fun and interactive, while ensuring it remains safe enough for them to explore the benefits of Generative AI.

Measures in place:

- Profanity filter
- Nudity filter
- Violence filter
- Depiction of flags and symbols

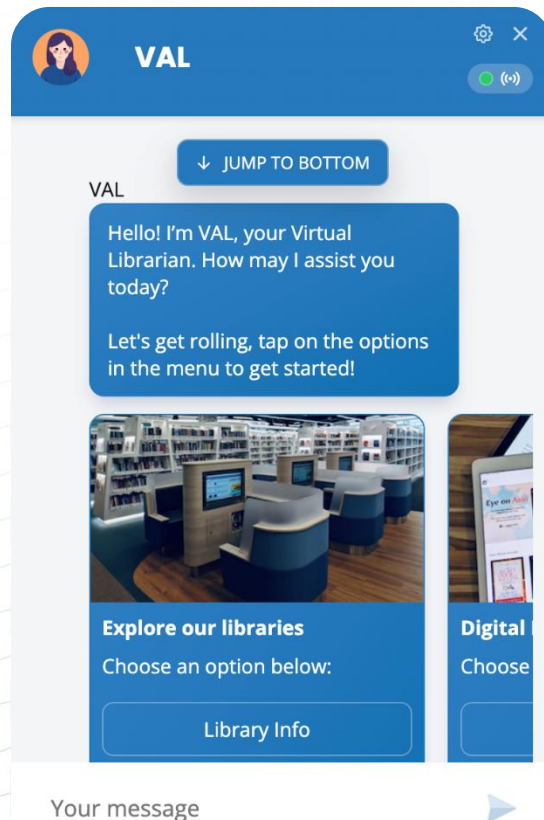


FROM CHATBOTS TO CONVERSATIONAL AI

CHATBOT

Automated chatbot systems have been available for some time. With recent developments, they are better capable of answering contextualised queries and providing responses based on ingested data.

- NLB deployed VAL, a chatbot designed to answer basic user queries on our corporate website
- Since 2024, the chatbot has consistently handled an average of 3,000 queries monthly, effectively bridging service gaps as NLB libraries transitioned to counterless operations
- Manpower could then be redistributed to higher-value library services

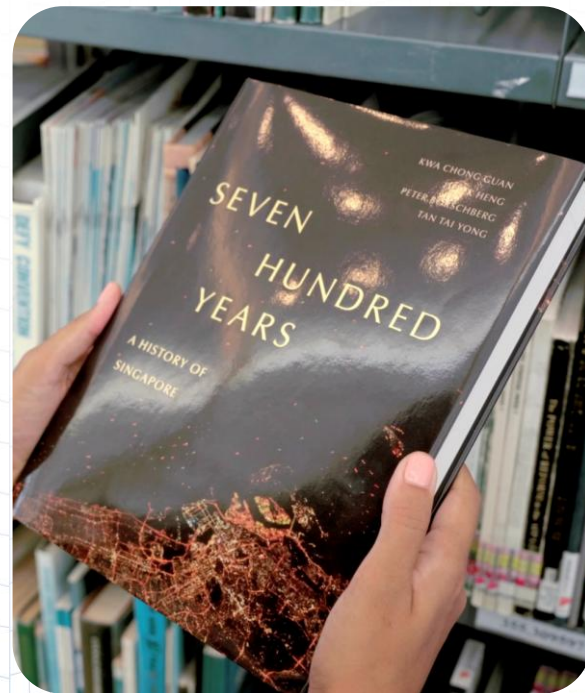




CHATBOOK SEVEN HUNDRED YEARS: A HISTORY OF SINGAPORE

ChatBook, the first of its kind, explores how one can converse with AI to discover more about specific subject matters from a book.

- A proof-of-concept was developed in 2023 by ingesting the contents of the book "Seven Hundred Years: A History of Singapore" into an LLM
- Targeted at researchers, the service enables them to ask anything about Singapore's history, and the AI provides concise responses with references from the book
- Authors' consent was sought to use the book for the service





INTERCONTINENTAL

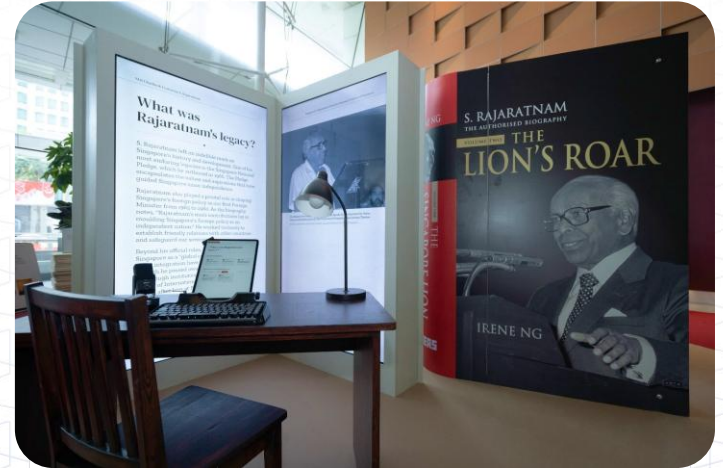
Hello!

S. RAJARATNAM
THE AUTHORIZED BIOGRAPHY

THE

CHATBOOK FEATURING S. RAJARATNAM

- The second iteration of ChatBook was developed in 2024 and featured S. Rajaratnam, one of Singapore's founding fathers
- A biography of S. Rajaratnam, written by Irene Ng, was ingested into the LLM alongside archival photographs of key events
- Users interact through a tablet, microphone, and keyboard to ask questions, then watch responses appear on a book-shaped display with accompanying text-to-speech narration and photographs





CHATBOOK JOURNEY TO THE WEST

- The third iteration of ChatBook was deployed in 2025 and featured the Journey to the West stories
- This iteration shifted its focus to younger audiences by adopting a more game-like approach to its design
- Users can pose questions to animated versions of Sun Wukong, Zhu Bajie, Sha Wujing, and Tang Sanzang
- Responses appear as texts and are also spoken verbally by the characters through text-to-speech with lip-syncing



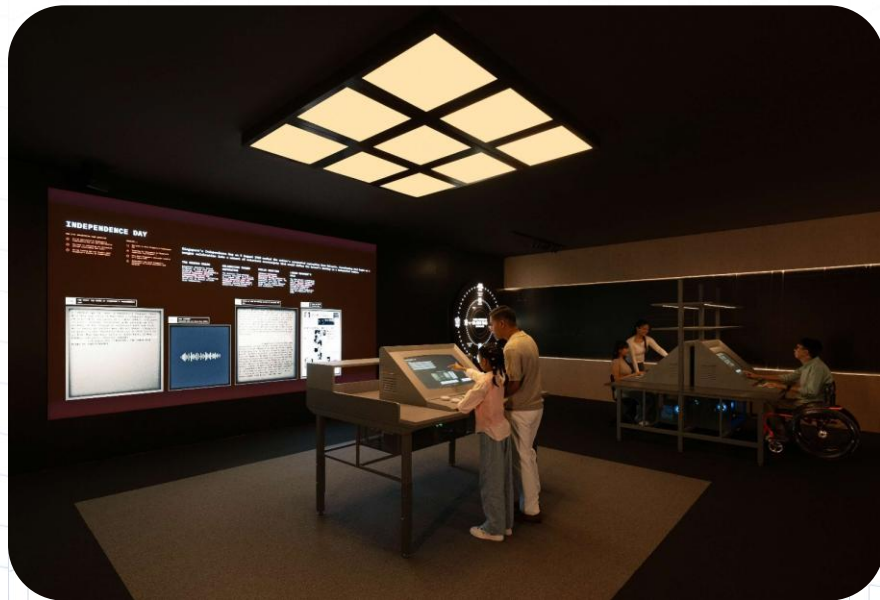
CHATBOOK JOURNEY TO THE WEST

- Designed to spark interest in these stories amongst children, encourage reading, and promote multiculturalism
- A sign language avatar was subsequently integrated into the ChatBook service as a proof-of-concept for its translation capability, as well as to test the receptiveness and effectiveness of such services within the deaf community
- This represented a move towards making our services more inclusive and accessible for all



CHATBOOK ALBATROSS

- Latest iteration of the ChatBook launched as part of a permanent exhibition featuring the Albatross file which covers the events that led to Singapore and Malaysia's separation
- Designed to resemble an old super computer, the ChatBook provides answers and images based on the user's query
- References publications and NLB's repository of images, videos, oral histories and articles



eConcierge

A culmination of the chatbot and ChatBook technologies, the eConcierge reduces the need for front-desk staff and enables basic queries to be answered by an AI avatar, optimising manpower and staffing resources.

- Service queries and responses are ingested into the LLM
- The system features text-to-speech, lip-syncing, and a 3D human avatar to create a natural experience for patrons, as if they are conversing with a Library Officer



LIBRARIES AS A SPACE FOR EXPERIENCES

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These services have played a crucial part in transforming our libraries into centres of learning and technological exploration. The shift in focus towards building our libraries as spaces for experiences helps improve engagement with our patrons.

Benefits:

- Patrons engage with the latest technologies through experiential and interactive solutions
- By providing our patrons with memorable experiences, more are likely to return
- We transform the perception that libraries are merely places for borrowing books



CHALLENGES & SOLUTIONS

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User-Centric Design

What do internal and end users need or want?

Challenges

- Limited options
- Overwhelming visuals and hardware
- Unintuitive steps to get started

Solutions

- Enable customisation
- Simplify end user input devices
- Configure hardware and software

Technical Requirements

What does the service need to function effectively?

Challenges

- Hardware failures
- Unstable or weak network connectivity

Solutions

- Implement device hardening and regular maintenance
- Reduce required hardware or consider allowing users to access from their phones
- Utilise LAN or 5G networks

Staff Training

What can we do to facilitate daily operations?

Challenges

- Difficult to set up and use
- Overcoming fear of technology

Solutions

- Automate daily startup and shutdown procedures
- Simplify instructions
- Demonstrate ease of use and provide troubleshooting guidance
- Daily testing

CHALLENGES & SOLUTIONS

Iterative Exploration

How can we further improve the service?

Challenges

- Difficulty deploying to more sites
- Content customisation

Solutions

- Build scalability into the project from the outset
- Develop with end goal in mind, e.g. 16:9 aspect ratio and refresh of content for StoryGen

Common Issues with Gen AI

What issues arise from the use of Generative AI?

Challenges

- Depiction of extra hands, limbs, and unwanted objects
- Consistency in character representation
- Adherence to prompts
- Language translation accuracy

Solutions

- Extensive testing
- Implement negative prompting
- Glossary for LLM to reference before generating output

Public Perception

What does the public think of the service?

Challenges

- Difficulty developing services that are inclusive and beneficial for all
- Copyright issues

Solutions

- Consider deliverables and organisation's strategy
- Disclaimer on limitations
- Secure necessary rights and permissions to use

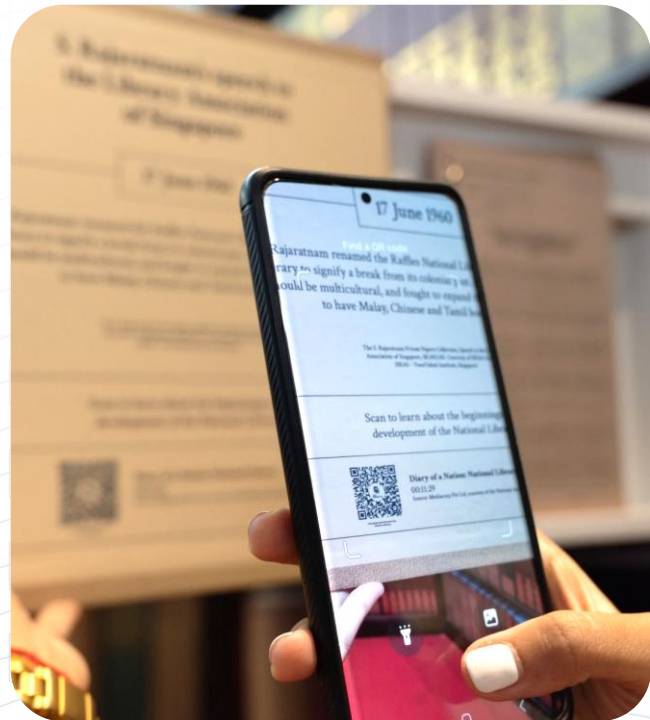
POSSIBILITIES

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AI is advancing at an incredible pace. There are endless possibilities, and we are limited only by our imagination.

Food for thought:

- How do we leverage AI to improve productivity and enhance engagement with our patrons?
- How can AI be used to educate patrons about AI itself?
- What AI services can we combine to create novel interactive experiences for patrons?



CONCLUSION

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Experiential and interactive AI technologies are crucial for keeping our libraries relevant. By adopting these technologies within our work and services, we can transform the way we engage with our patrons.

- Start small, then scale up
- Continuously evaluate what works and what does not work in each iteration
- Apply learnings from past projects to future endeavors
- Consider how technology can be utilised as edutainment





THANK YOU

