NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

From Awareness to Automation: Building Digital Capabilities in Libraries

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Outline

- Awareness and Automation: Building Capabilities
- Automation Projects
- Conclusion

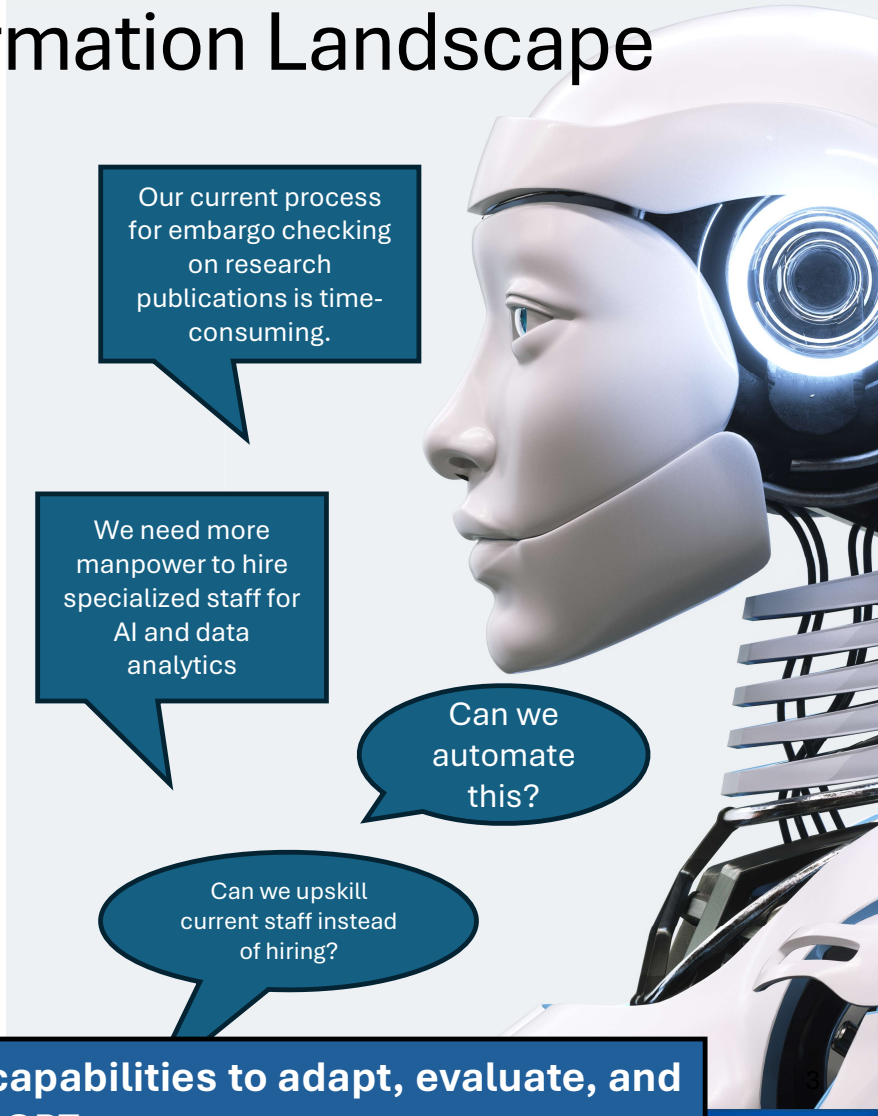
Navigating the Post-ChatGPT Information Landscape

New Expectations in a GenAI World

- **Digital and AI Literacy:**
  - Libraries must equip staff and users with AI and digital skills to stay relevant
- **Enhanced Efficiency Expected**
  - Faster, more accessible services

Rethinking Data and Digital Literacy

- Tap on digital skillsets to empower the NTU community so that we are aligned to the University's success.



We must build **staff capabilities to adapt, evaluate, and lead** in the post-ChatGPT era

Awareness and Automation: Building Capabilities

An approach and answer to building digital capabilities

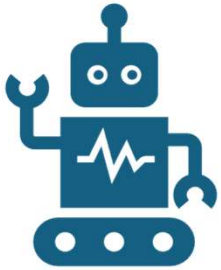
Building Capabilities Through Automation - AI Tools + Skills + Empowerment Model

- **Empower Staff** – Upskill staff to drive automation projects
- **Build Skills** – Train teams in automation development and maintenance
- **Ensure Ethics** – Integrate responsible AI practices (e.g., when using GAI for automation work)
- **Strengthen Data Literacy** – Cultivate a foundation for automation

Digital Transformation: Building Capabilities

Approaches

AI Ethics and Staff Skills Development



Automation & Project Incubation

Activities

- AI and Digital Literacy Programme for Staff
- Consultation and Clinic Sessions for Project Leaders
- Co-creation of Automation Solutions such as:
  - Guided Application: Certificates from Data
  - Automating Repository Upload Reminders

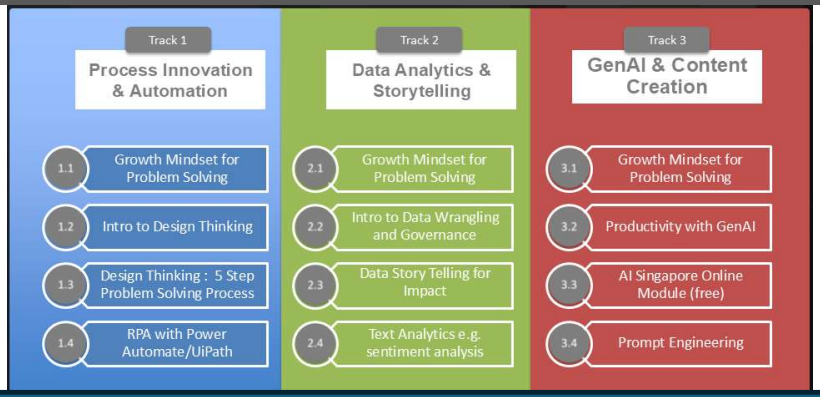
Impact and Capabilities

- Instilling a Growth Mindset
- Building up Data Literacy for automation readiness
- Empowering project leaders
- Guiding and mentoring colleagues on the digital transformation journey

AI Ethics and Staff Skills Development

AI and Digital Literacy Programme

- Tools taught:
  - Power Automate
  - Online Generative AI applications
  - Microsoft Excel Power Query



- Topics covered:
  - Ethics of Generative AI use
  - Data cleaning and organisation
  - Data governance
  - Design Thinking basics
  - Growth Mindset

This programme is our cornerstone for developing sustained digital capabilities among library and administrative staff.

Library's Role:

- Leading AI and Digital Literacy programme for Library and other administrative departments
- Designing workshops to help staff thrive as the organisation undergoes digital transformation

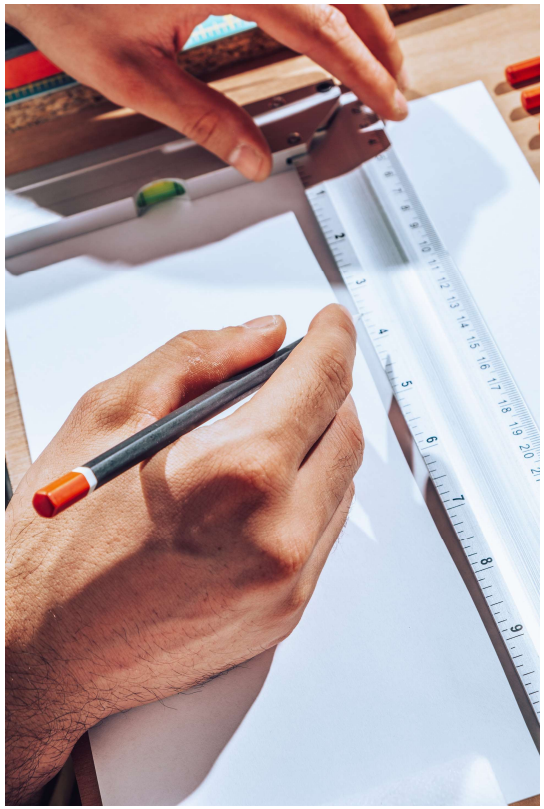
Automation Projects

A skills-capability building approach

Automation Projects

Our Approach:

Using real automation projects as opportunities to grow practical digital skills and confidence.



Projects Supported:

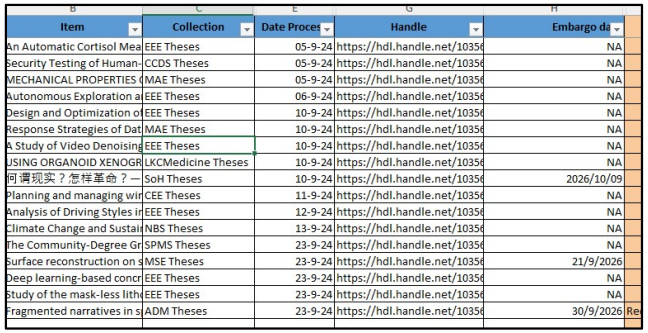
- 10+ collaborations and projects of varying degrees of complexity
- Directly worked multiple teams and colleagues

Tools Used:

- Power Automate
- Python
- GAI Tools (e.g., Python scripts generation, automation workflow ideation)
- Excel

Case 1 – From Manual Embargo Checks to Automation: Building Automation Workflow and Data Validation Skills

- **Objective**: Ensure data integrity, streamlined workflows, and protect sensitive research.
- **Capability Building**: DI-led consultations and coaching equipped the team with data validation and workflow design skills.
- **Ownership**: Empowered the team to lead and refine the automation process more independently.



Item	Collection	Date Proces	Handle	Embargo da
An Automatic Cortisol Mea	EEE Theses	05-9-24	https://hdl.handle.net/10356	NA
Security Testing of Human-	CCDS Theses	05-9-24	https://hdl.handle.net/10356	NA
MECHANICAL PROPERTIES (	MAE Theses	05-9-24	https://hdl.handle.net/10356	NA
Autonomous Exploration a	EEE Theses	06-9-24	https://hdl.handle.net/10356	NA
Design and Optimization of	EEE Theses	10-9-24	https://hdl.handle.net/10356	NA
Response Strategies of Dat	MAE Theses	10-9-24	https://hdl.handle.net/10356	NA
A Study of Video Denoising	EEE Theses	10-9-24	https://hdl.handle.net/10356	NA
USING ORGANOID XENOGR	LKCMedicine Theses	10-9-24	https://hdl.handle.net/10356	NA
何谓现实？怎样革命？—	SoH Theses	10-9-24	https://hdl.handle.net/10356	2026/10/09
Planning and managing wir	CEE Theses	11-9-24	https://hdl.handle.net/10356	NA
Analysis of Driving Styles ir	EEE Theses	12-9-24	https://hdl.handle.net/10356	NA
Climate Change and Sustair	NBS Theses	13-9-24	https://hdl.handle.net/10356	NA
The Community-Degree Gr	SPMS Theses	23-9-24	https://hdl.handle.net/10356	NA
Surface reconstruction on s	MSE Theses	23-9-24	https://hdl.handle.net/10356	21/9/2026
Deep learning-based concr	EEE Theses	23-9-24	https://hdl.handle.net/10356	NA
Study of the mask-less lith	EEE Theses	23-9-24	https://hdl.handle.net/10356	NA
Fragmented narratives in s	ADM Theses	23-9-24	https://hdl.handle.net/10356	30/9/2026

Records checked against request data

```
    else:
        return 'Embargo date not set'


# Apply the function to create the 'Embargo date' column in the ServiceNow file
sn_closed_complete['Embargo date'] = sn_df['Opened by'].apply(check_date)

# Merge the 'Embargo date' column back into the original SN DataFrame
sn_df = sn_df.merge(sn_closed_complete[['Opened by', 'Embargo date']], on='Opened by', h

# Save the updated ServiceNow file with the new 'Embargo date' column
sn_df.to_excel('SN_file_with_embargo_date.xlsx', index=False)
```

Output generated from code

Empowered with knowledge to apply computational thinking to streamline processes and enhance productivity using automation tools.

er	State	Opened	Updated	Handle	Remarks	Embargo date
6095	Closed Com	27-08-2024 13:14:01	lhtik	https://hdl.handle.net		2026/03/06 0:00
6060	Closed Com	21-08-2024 14:06:43	bhong	https://hdl.handle.net		NaN
6049	Closed Com	19-08-2024 15:13:00	bhong	https://hdl.handle.net		2025/04/06 0:00
6046	Closed Com	19-08-2024 10:32:41	bhong	https://hdl.handle.net		2026/04/06 0:00
6037	Closed Com	15-08-2024 20:16:17	bhong	https://hdl.handle.net		2026/01/06 0:00
6036	Closed Com	15-08-2024 16:45:04	bhong	NIL		...
6033	Closed Com	15-08-2024 12:25:41	bhong			2025/03/05 0:00
6032	Closed Com	15-08-2024 11:28:10	bhong			
6024	Closed Com	14-08-2024 10:10:38	bhong	https://hdl.handle.net		2025/03/05 0:00
6020	Closed Com	13-08-2024 15:29:14	bhong	NIL		2026/04/05 0:00
6003	Open	11-08-2024 20:50:35	system		refer to RIT	Embargo date not set

Case 2 – Guided Application 2: Automating Certificates from Data

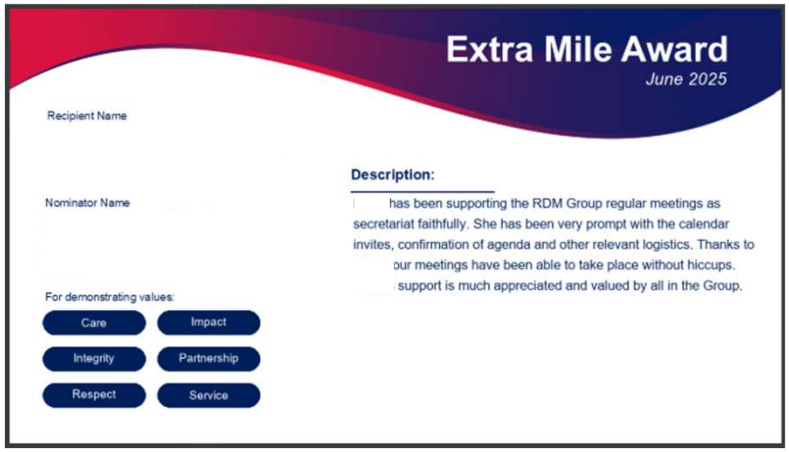
Objective: Automate staff recognition by streamlining monthly award announcements and generating personalized certificates to ensure consistent, polished celebration of achievements.

Please join us in congratulating the following recipients:

Recipients	Team	Source	Nominator	Description
	DSE	Extra Mile Award		Partnership When the team's renewal of a software hit an unexpected snag, , who was the previous administrator of this software, quickly came forward to help. He requested the vendor to provide a fresh quotation, and sought ways to reduce the subscription cost for the team. He then created the requisition on Ariba and notified the various parties to approve the submission. His quick actions enabled the team to get uninterrupted access to the software.

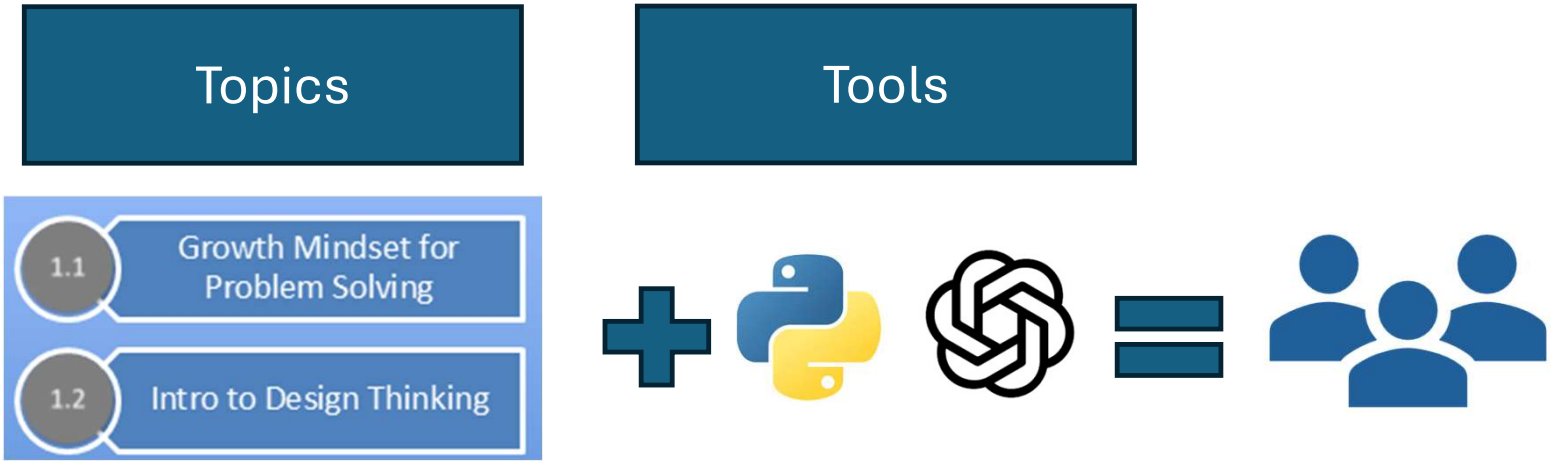
Worked with our team to explore automation tools and GAI tools like Python, ChatGPT

Coordinated and collaborated with design team to improve look and feel.



AI and Digital Literacy Programme, combined with coaching and collaboration, built the confidence and know-how to design, implement, and manage an automation solution.

Case 2 – From Learning to Action: Staff-Initiated Automation Enabled by the AI and Digital Literacy Programme

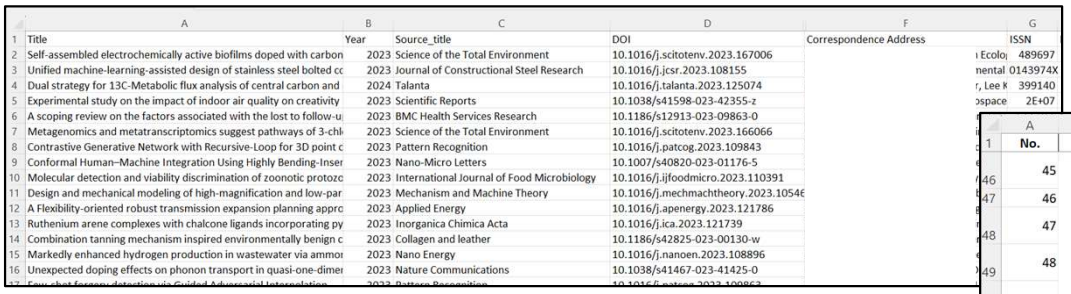


AI and Digital Literacy Programme, combined with coaching and collaboration, built the confidence and know-how to design, implement, and manage an automation solution.

Case 3 – Automate identifying of new NTU research papers for addition into the Institutional Repository

Objective: Streamline copyright-compliant NTU research submissions to our institutional repository

- Identify new publications that can be added into DR-NTU
- Transform, clean, and merge data : Scopus, DR-NTU, copyright policies
- Collate & format new publications into a mail merge document for NTU authors



	A	B	C	D	F	G
1	Title	Year	Source_title	DOI	Correspondence Address	ISSN
2	Self-assembled electrochemically active biofilms doped with carbon	2023	Science of the Total Environment	10.1016/j.scitotenv.2023.167006		489697
3	Unified machine-learning-assisted design of stainless steel bolted cc	2023	Journal of Constructional Steel Research	10.1016/j.jcsr.2023.108155		0143974X
4	Dual strategy for 13C-Metabolic flux analysis of central carbon and	2024	Talanta	10.1016/j.talanta.2023.125074		399140
5	Experimental study on the impact of indoor air quality on creativity	2023	Scientific Reports	10.1038/s41598-023-42355-z		2E+07
6	A scoping review on the factors associated with the lost to follow-u	2023	BMC Health Services Research	10.1186/s12913-023-09863-0		
7	Metagenomics and metatranscriptomics suggest pathways of 3-chl	2023	Science of the Total Environment	10.1016/j.scitotenv.2023.166066		
8	Contrastive Generative Network with Recursive-Loop for 3D point c	2023	Pattern Recognition	10.1016/j.patcog.2023.109843		
9	Conformal Human–Machine Integration Using Highly Bending-Inser	2023	Nano-Micro Letters	10.1007/s40820-023-01176-5		
10	Molecular detection and viability discrimination of zoonotic protozc	2023	International Journal of Food Microbiology	10.1016/j.ijfoodmicro.2023.110391		
11	Design and mechanical modeling of high-magnification and low-par	2023	Mechanism and Machine Theory	10.1016/j.mechmachtheory.2023.1054		
12	A Flexibility-oriented robust transmission expansion planning apprc	2023	Applied Energy	10.1016/j.apenergy.2023.121786		
13	Ruthenium arene complexes with chalcone ligands incorporating py	2023	Inorganica Chimica Acta	10.1016/j.ica.2023.121739		
14	Combination tanning mechanism inspired environmentally benign cc	2023	Collagen and leather	10.1186/s42825-023-00130-w		
15	Markedly enhanced hydrogen production in wastewater via ammor	2023	Nano Energy	10.1016/j.nanoen.2023.108896		
16	Unexpected doping effects on phonon transport in quasi-one-dimer	2023	Nature Communications	10.1038/s41467-023-41425-0		

Instilled best practices for data integrity to enable automation

	A	B	C	D
1	No.	ntu_email_1	DOI	Title
46	45		10.1016/j.neucom.2023.	1. Knowledge-based BERT word embedding fine-tuning for emotion recognition 2. Feature-aware conditional GAN for category text generation
47	46		10.1021/acsami.3c06933	Unveiling Charge-Transfer Dynamics at Singlet Fission Layer/Hybrid Perovskite Interface
48	47		10.1007/s11768-023-001	1. System identification and control of the ground operation mode of a hybrid aerial–ground robot 2. Tracking consensus for uncertain nonlinear multi-agent systems under cloud-based event-triggered coordination
49	48		10.1016/j.nanoen.2023.	1. Harvesting and mapping ultrasonic vibration power using semiconducting wire-based tribovoltaic generators 2. Thermal characteristics of tribovoltaic dynamic Schottky junctions
50	49		10.1002/adma.2023065	1. Hetero-Polyionic Hydrogels Enable Dendrites-Free Aqueous Zn-I2 Batteries with Fast Kinetics 2. Inert Filler Selection Strategies in Li-Ion Gel Polymer Electrolytes 3. Dynamic Balance of Partial Charge for Small Organic Compound in Aqueous Zinc-Organic Battery
51	50		10.1016/j.jallcom.2023.1	Thermal decomposition behavior and computational analysis of alpha and beta manganese dioxide nanorods
52	51		10.1016/j.jcta.2023.1058	1. Real equiangular lines in dimension 18 and the Jacobi identity for complementary subgraphs 2. Hermitian matrices of roots of unity and their characteristic polynomials

Case 3 – Automate identifying of new NTU research papers for addition into the Institutional Repository

How we are building digital capabilities

- Enhanced staff's data literacy by applying more advanced Excel techniques (e.g. Excel VBA, formulas) with the help of GenAI tools for efficient data cleaning and transformation needed for the automation.

- Instilled best practices for data integrity to enable automation

Future Directions & Conclusion

What We Learned About Driving Digital Transformation with Automation

- Start small: Pick automation projects that solve clear problems.
- Use tools as learning opportunities, not just solutions.
- Build confidence through coaching, collaboration, and celebrating progress.

Conclusion

We are in the midst of a watershed moment, with the explosive growth of new AI technologies. The genie has been set free and will never be put back again.

Institutions around the world, not just Libraries, will be transformed in the coming years. Here at NTU Library, we have adopted a capability building approach.

“As technology evolves, our greatest asset will be our people. Building digital capabilities—skills, mindsets, and cultures—will empower us to thrive in a rapidly changing landscape.”

Thank you