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Recasting the Mould – Librarianship of the Future: leveraging Automation, APIs, and AI

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Introduction

A little bit about me

Been an academic librarian for 8 years

Worked in two university libraries in various teams:

- Instruction Services
- Advisory & Consultation (Research Librarian)
- User & Access Services
- Service Innovation & Excellence
- Technology & Innovation

Interested in:

User experience, no/low code automation, AI literacy & ethics

Fun fact: I speak three languages, can code in ?? languages

SMU SCHOOLS & COLLEGES

MULTI- AND INTER-DISCIPLINARY OFFERINGS

With its 6 schools and 2 colleges, SMU offers a wide range of programmes in undergraduate, postgraduate and professional and continuing education in the disciplines of Accountancy, Business, Computing, Economics, Integrative Studies, Law, and Social Sciences.

College of Graduate Research Studies

College of Integrative Studies

Lee Kong Chian School of Business

School of Accountancy

School of Computing and Information Systems

School of Economics

School of Social Sciences

Yong Pung How School of Law

FACTS & FIGURES

10,129
Full-Time Undergraduates*

426
Full-time faculty

3,201
Full-Time and
Part-Time Postgraduates*

62% international postgraduate students from **51 countries****

9%** international undergraduate students from **35 countries****

38% international faculty
Representing
33 nationalities

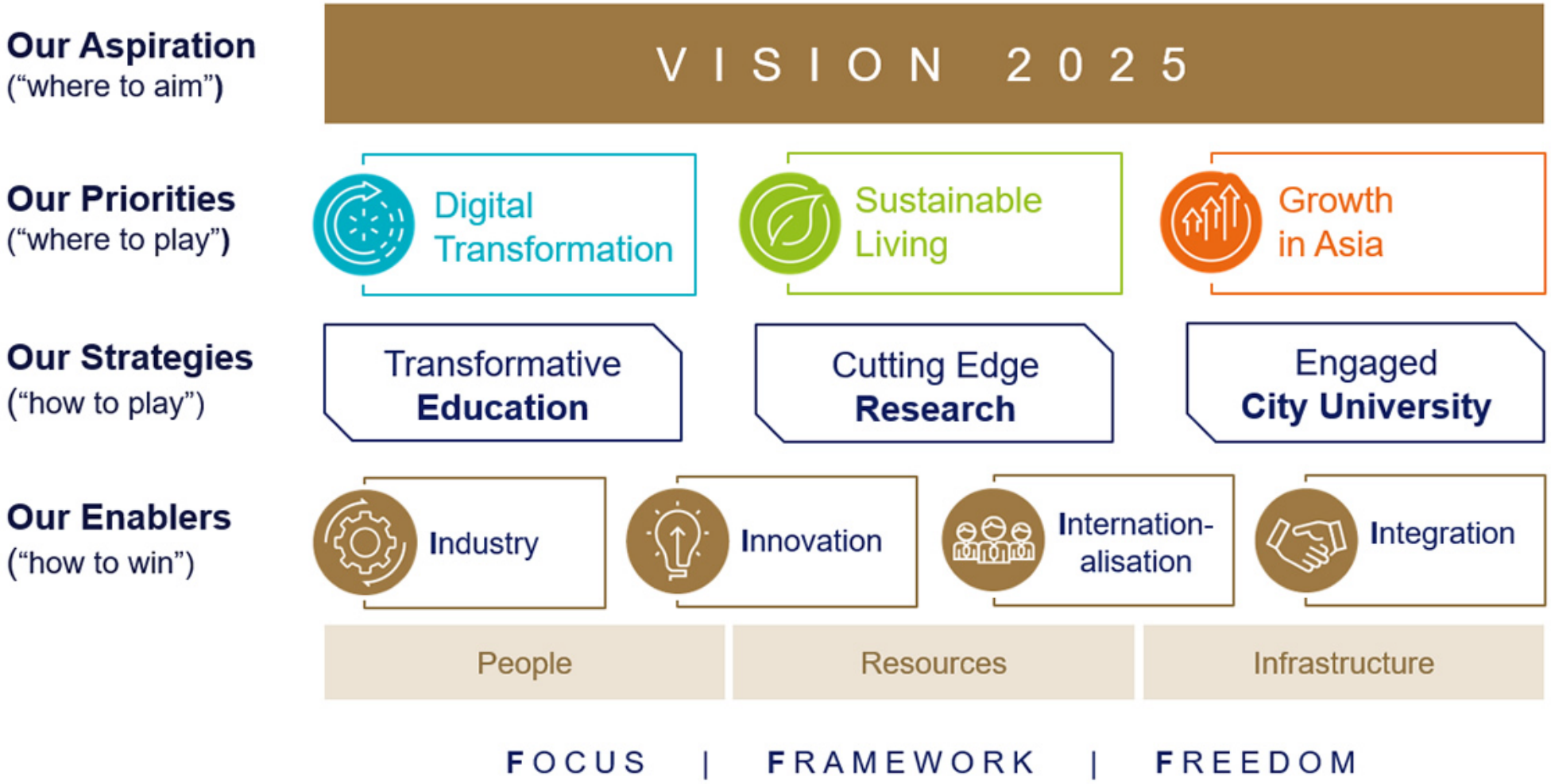
40,230
Alumni*

Information is accurate as of *11 September 2023 & **14 November 2023.

SMU Libraries

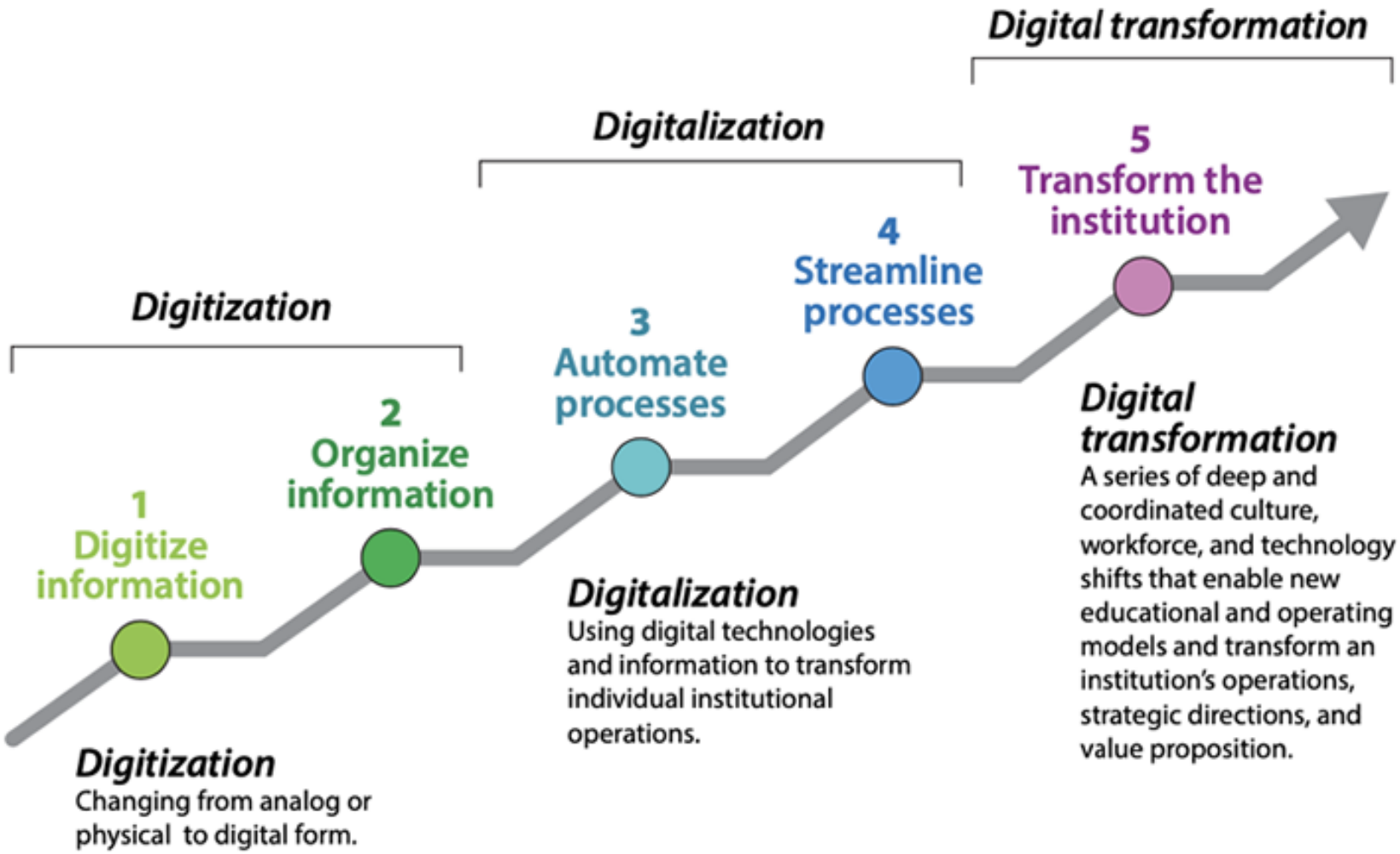
- Over 1m visitors in 2023
- 2,300 seats and 10,700 sqm across 2 libraries:
- Li Ka Shing Library, and
- Kwa Geok Choo Law Library
- Physical and virtual learning environments and services
- 38 staff – 23 professional librarians

SMU 2025: Growing Impact, Cultivating Change



Read more here

Digital Transformation in SMU Libraries



Since 2020, SMU Libraries has been working to digitize and digitalize our processes.

Digitize:

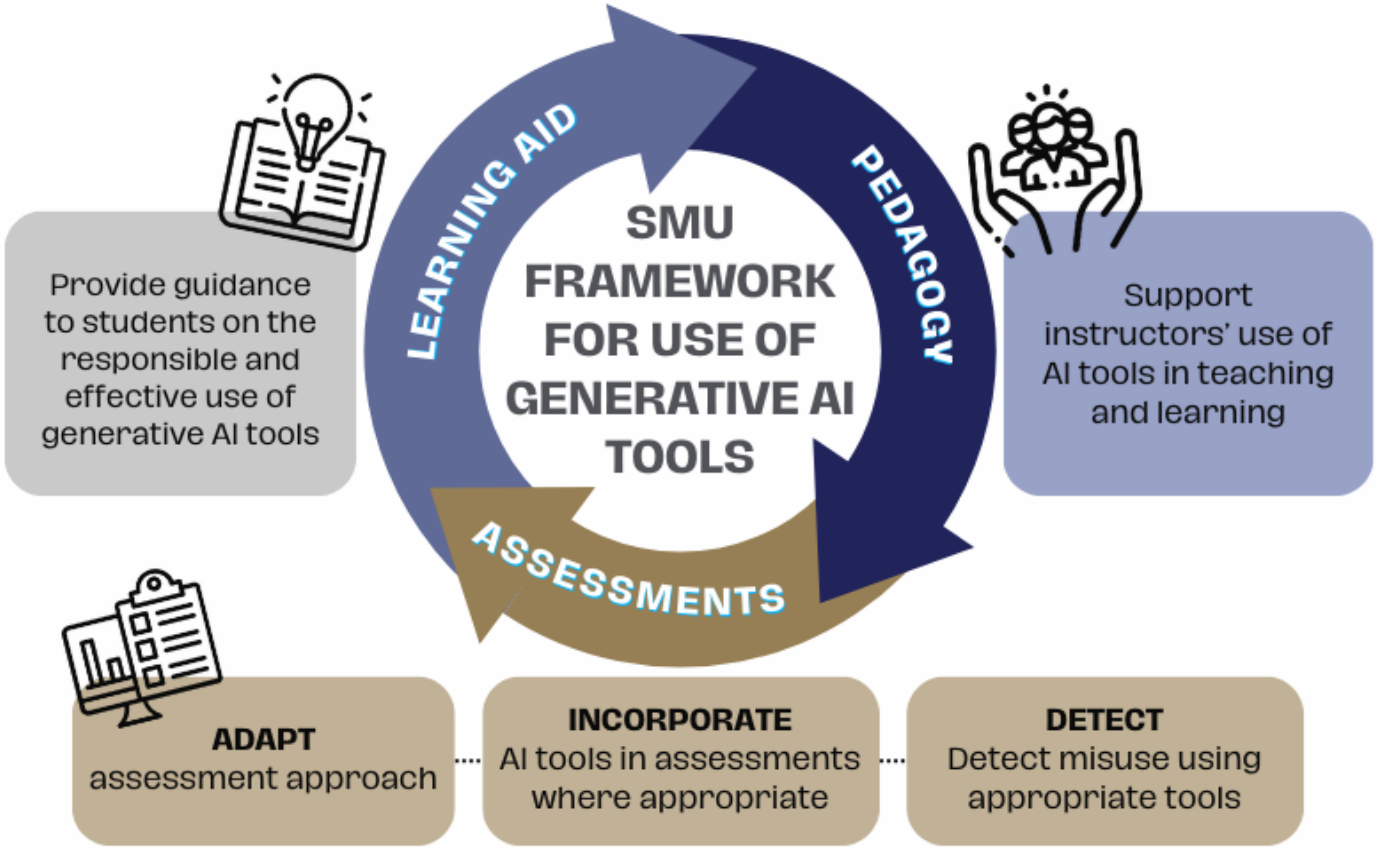
- All forms are now e-forms
- Either using Primo forms or Microsoft Forms

Digitalize:

- Using Power Automate to speed up processes with one-click approvals and auto-routing of requests

Katuu, Shadrack. (2022). Management of public sector records in the digital age. 10.13140/RG.2.2.25539.48163.

SMU Framework for Use of Generative AI Tools



SMU's position

The University recognises the benefits of generative AI tools and is committed to integrating generative AI tools into education, while safeguarding academic integrity and rigour. At the same time, the University aims to teach students to use these tools responsibly and effectively.

Read more here

AI Literacy Initiatives by SMU Libraries

Initiative	Description	Audience
SMU adoption of Microsoft 365 Copilot	SMU is exploring the use of Microsoft Copilot for staff and faculty, the Library was invited to contribute a segment on Ethics and Responsible Use	Staff & Faculty
Guide to Learning with AI online module	A digital learning object on the effective and responsible use of AI tools in research was jointly developed by SMU Libraries and Temasek Polytechnic Library	Students
AI for Research Week 2024	A 3-day event as part of advocacy, promotion, and outreach. Brought together experts, researchers, and enthusiasts to explore and discuss how they can use Artificial Intelligence in different parts of the research process	Researchers & Faculty
Hackathon 2023	24 hours of collaboration and exploration to leverage the power of technology to craft creative applications that enhances library and research experience	Students
Workshop: When AI Goes Wrong	Out-of-classroom learning on AI literacy, understanding, awareness, and critical evaluation	SMU Community

New competencies

- Understanding and implementing Privacy and Data Protection
  - Understanding legal and **ethical implications of data handling, implementing strong data protection measures**, and educating users of their privacy rights

- Digital Literacy and Technology Integration
  - Ability to evaluate and **adopt new technologies** that enhance user engagement, library operations, and service delivery

- Responsible Data Science and Analytics
  - Using data visualization tools to effectively communicate data to stakeholders
  - **Compare and contrast different AI models and critically evaluate them for ethical implications and suitability** in addressing library challenges

- Sustainability Practices
  - Minimizing energy consumption characteristic of deep learning to **minimize environmental impact** by choosing to utilize greener models

Ghoush, V., & McCoy, D. (2024). Looking ahead: Incorporating AI in MLIS competencies. *School of Information Student Research Journal, 14*(1).

Case Study – Membership automation

Good Old-Fashioned AI

An argument for rules-based AI:

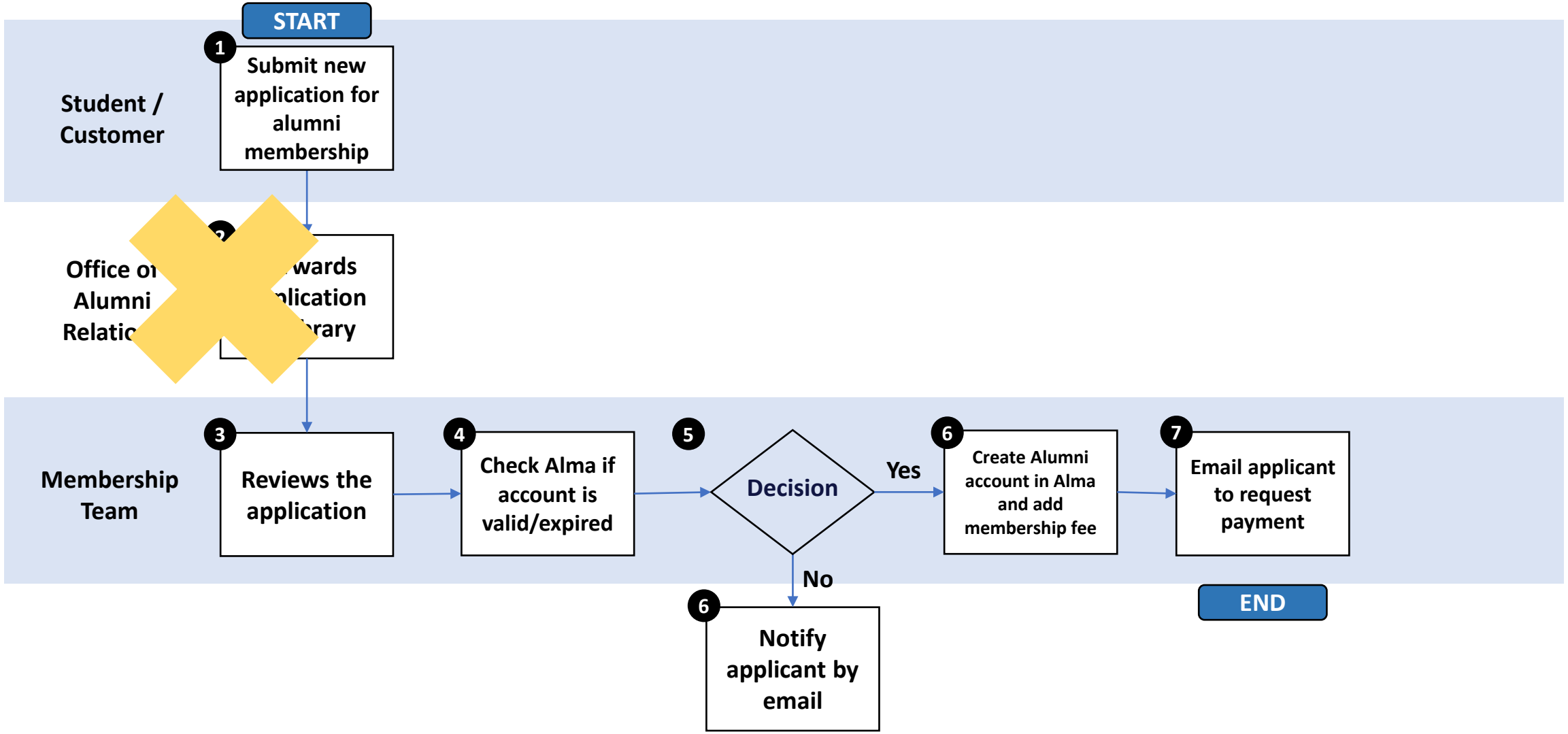
- Reliable
- Works as programmed, easy to trace the root causes for mistakes and thus easy to fix

- AI products out in the market may not be as sophisticated as marketed
- Elements/portions of it will rely on rules-based

- Understanding how programs are organised and the logic flows will help you build a greater appreciation of modern AI tools

- Possibly can expand this skill in computational thinking to work through other work processes and redesign them as well

AS-IS Process Swimlane Diagram (Before)



Planning, planning, planning

70% of the work is planning

Overall goal: enhancing user experience with the library/library systems

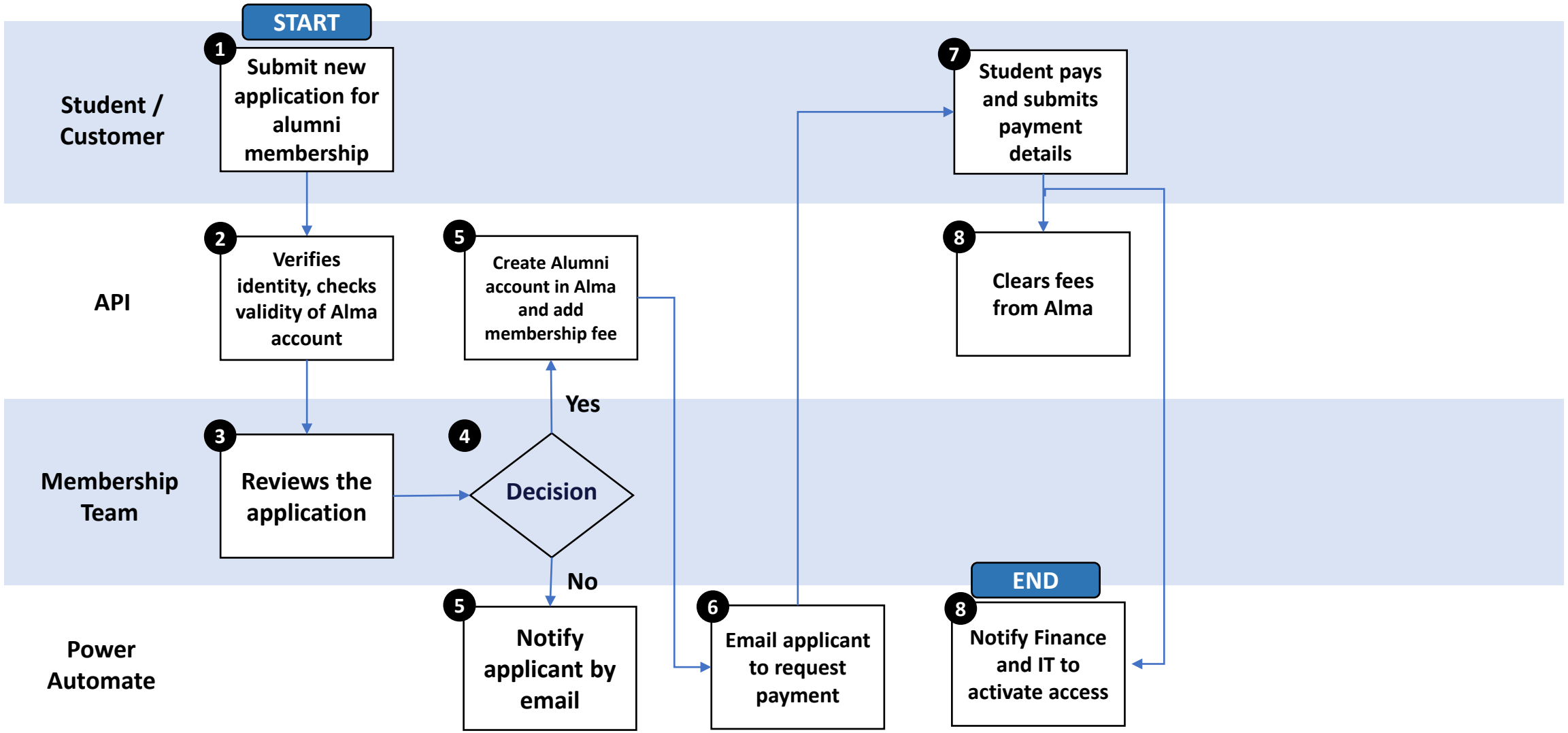
Things to keep in mind:

- Stakeholder engagement – end users, library staff in charge of the process, other business units within your organization, etc.
- Possibilities using available REST APIs: https://developers.exlibrisgroup.com/alma/apis/

Principles of Trustworthy AI, for example:

- Robustness: ensuring errors are handled
- Explainability: ensuring the logic flow is well documented
- Human agency and accountability: ensuring escape routes
- Preserving privacy: ensuring personal data is only retrievable by people who need to know, being upfront with what data collected will be used for

AS-IS Process Swimlane Diagram (After)



Improvements to entire process

- Reduced total number of fields the user has to fill in
- Automated creation of Alumni ID based on Student ID
- Automated creation of user record and fines
- Reduced human labour and also possibility of human error in creation of record
- Integrated approval process to channel to respective parties
- Speeds up the entire process and improves turnaround time to the applicant
- Record of application automatically kept
- Able to pre-fill forms to reduce applicant from having to key in the information

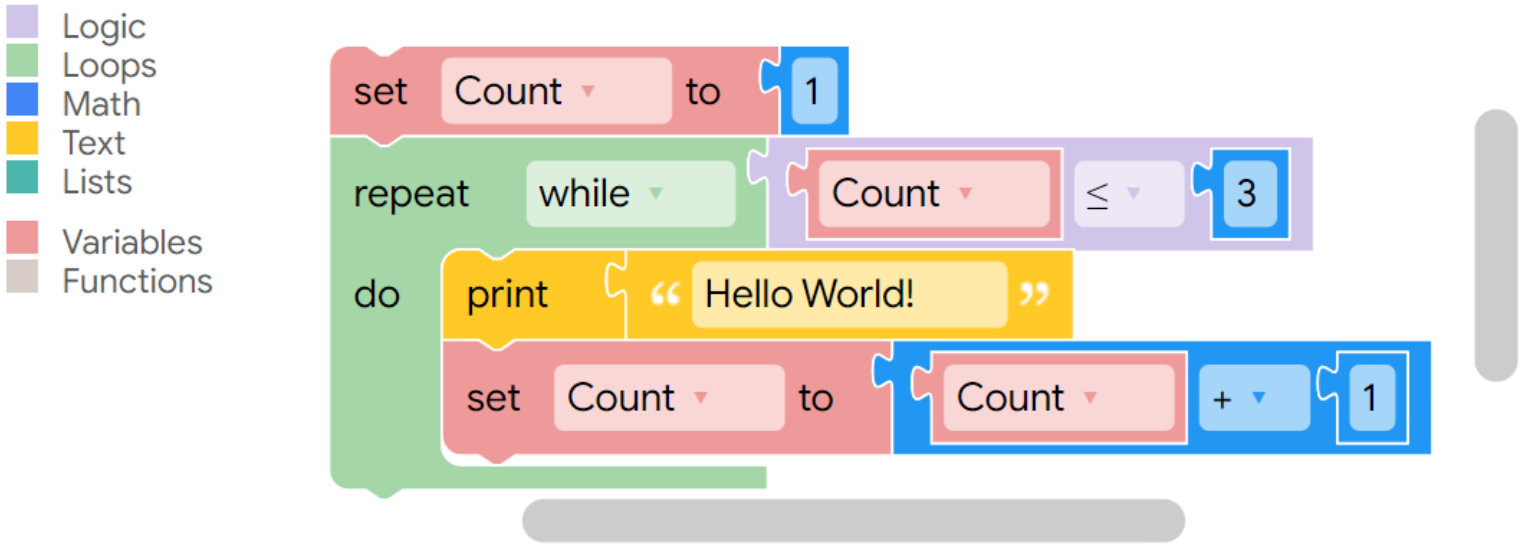
Low-code programming/block coding

Instead of typing out the code, template blocks are provided for you to build and combine visually like building blocks

Advantages:

- Graphical so you're able to visually see the flow, syntax-independent
- Able to click and drag to move "pieces" around

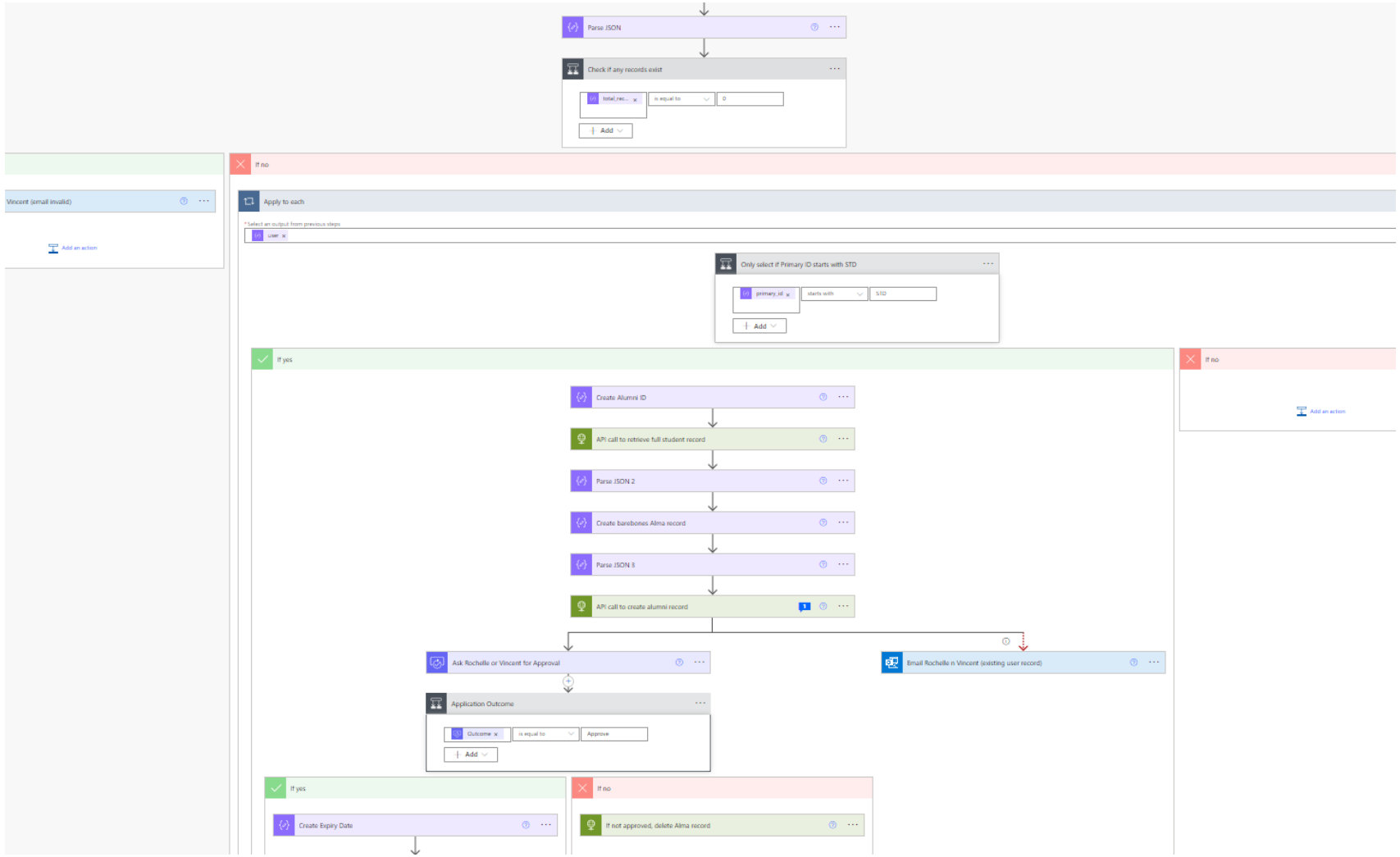
[Blockly by Google]



Starting your flow

1. Pick a trigger: mine was when an application form is submitted
2. Retrieve the details of the application
3. Initialise some variables to be used later*
4. Use the API to check if the applicant's record is valid

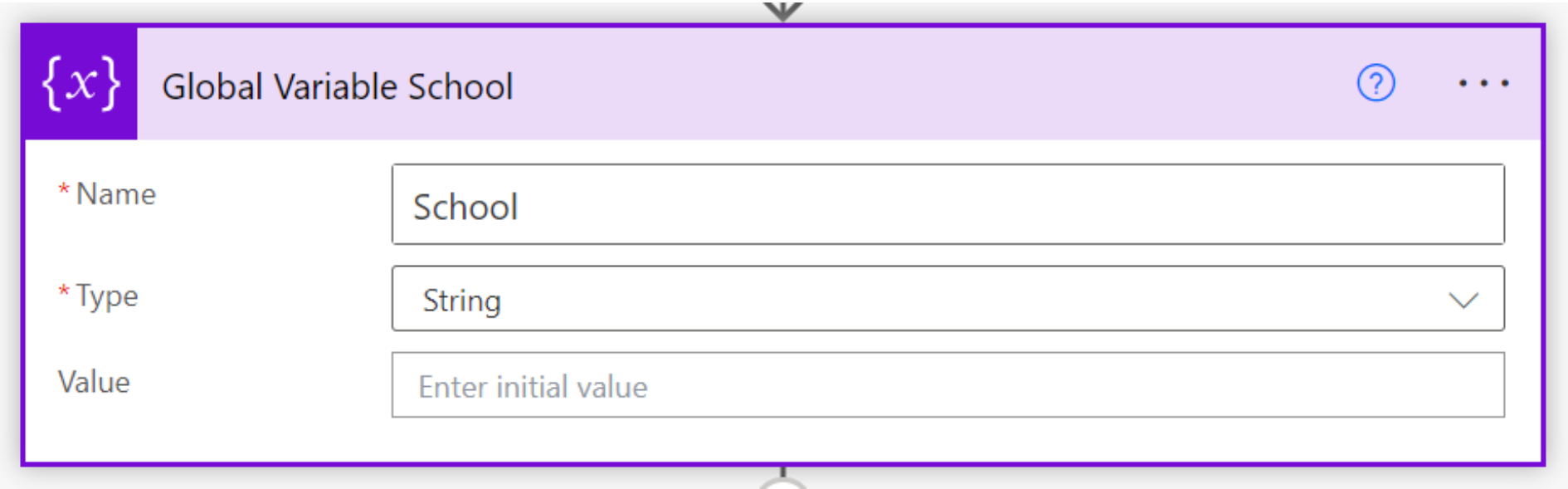
Then things get a bit more complicated



5. IF it's a valid application, continue, ELSE email business manager
6. Create Alumni ID to become Primary ID and create the barebones record in Alma (to check if one already exists)
7. Ask for Approval to continue (routed to Teams/Outlook)
8. IF approved, complete Alma record, ELSE delete barebones record
9. Add fees and send email to applicant to request payment details

Brief introduction to Power Automate Connectors

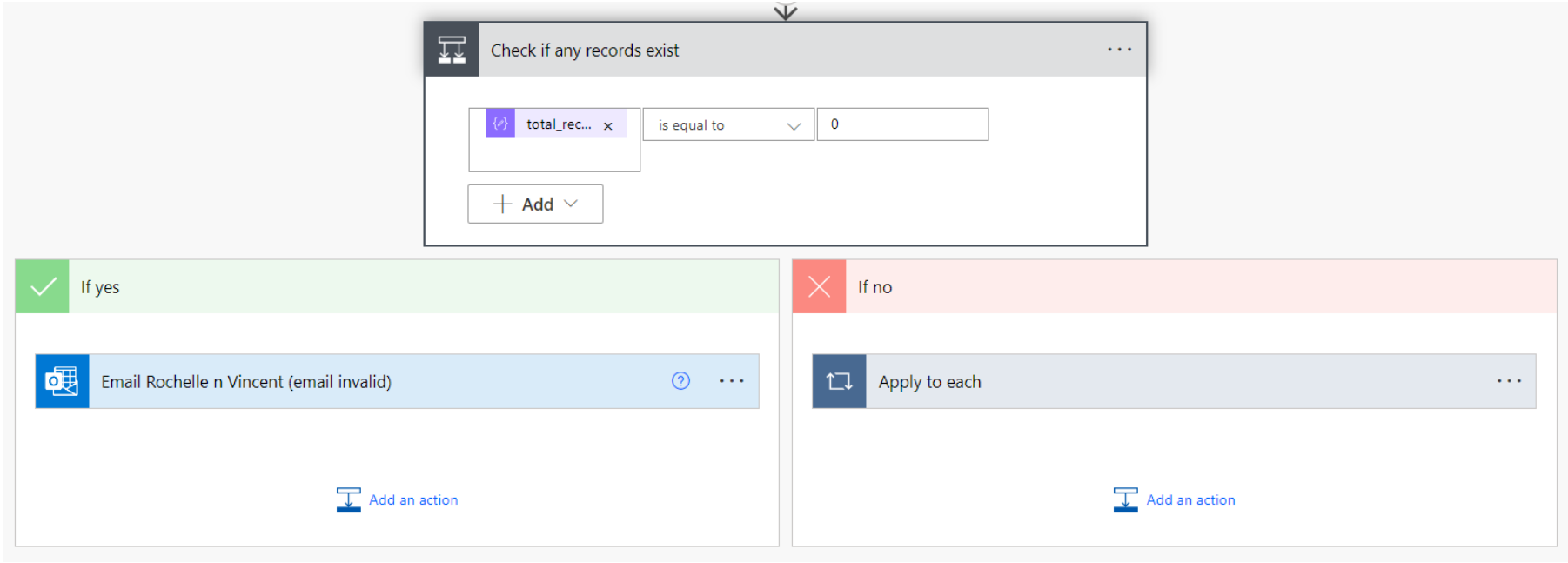
Global Variables



Connector: Initialize variable

- Needs to be created at the beginning (after the initial trigger)
- Enables you to define an empty variable to store data later on

If/Else and For loops



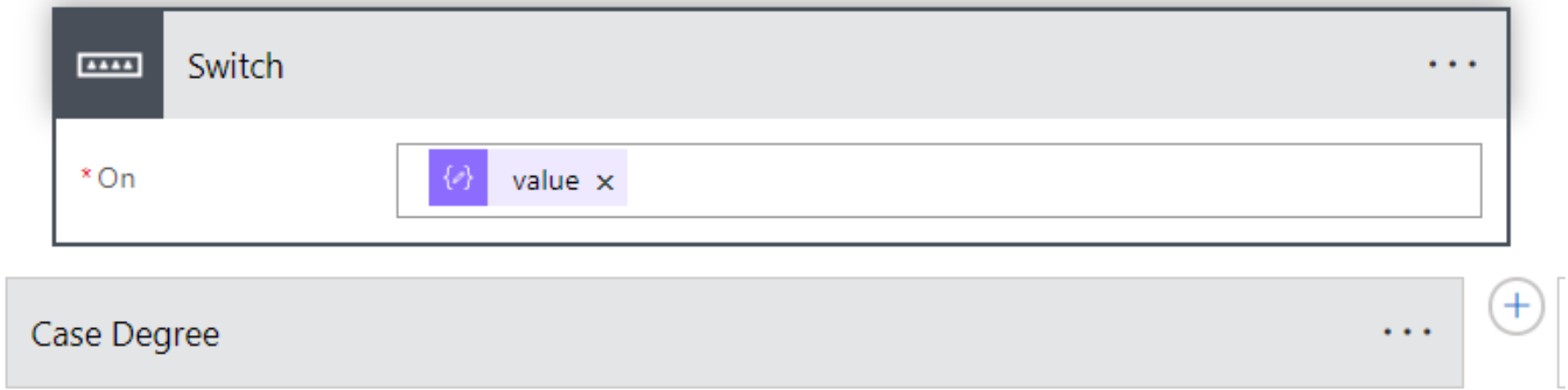
Connector: Condition

- Enables you to handle cases if they fulfill specific conditions e.g., IF applicant is renewing, then retrieve existing record. ELSE create new record

Connector: Apply to each

- Enables you to run at every change in a variable e.g., for every record retrieved, change their address

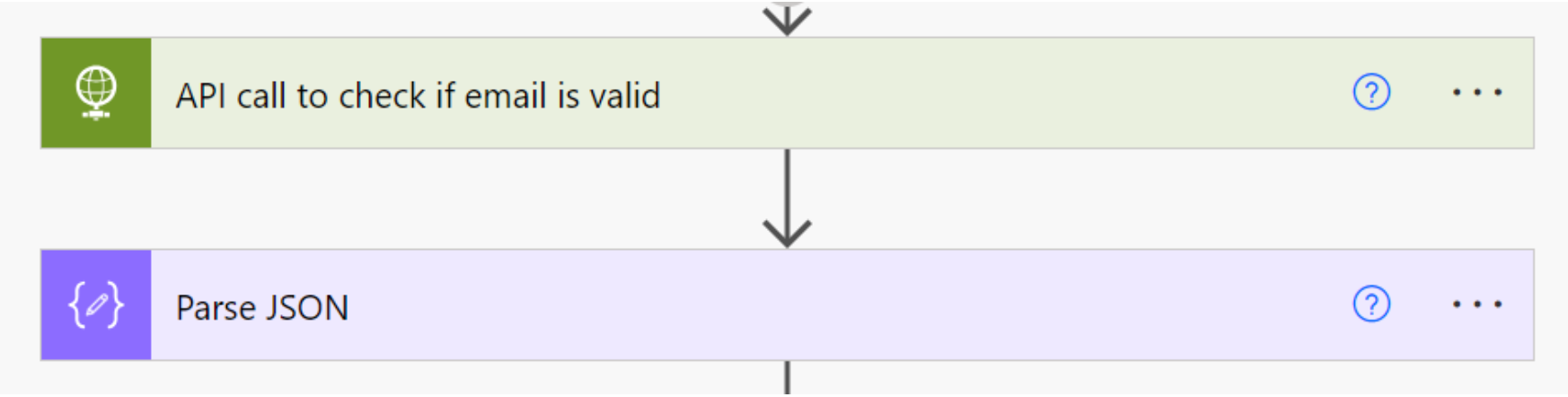
Case Switch



Connector: Switch

- Similar to a IF/ELSE or FOR loop, but you can specify what happens for particular values and you have more than 2 cases (otherwise an IF/ELSE would work fine) e.g., if you have three different types of identifiers and want to specify what values would go into them

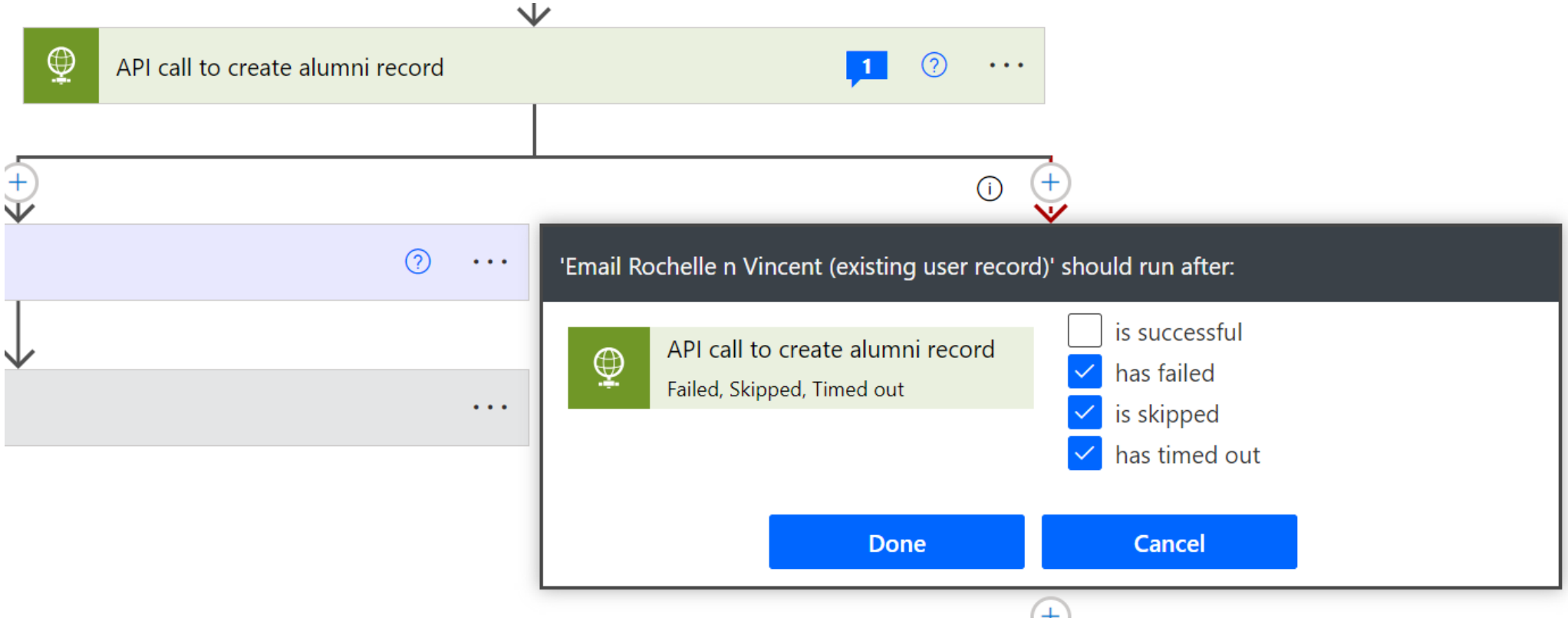
API Call



Connector: HTTP

Link any API you have access to here, usually paired with Parse JSON to be able to change it into usable values further down in the flow

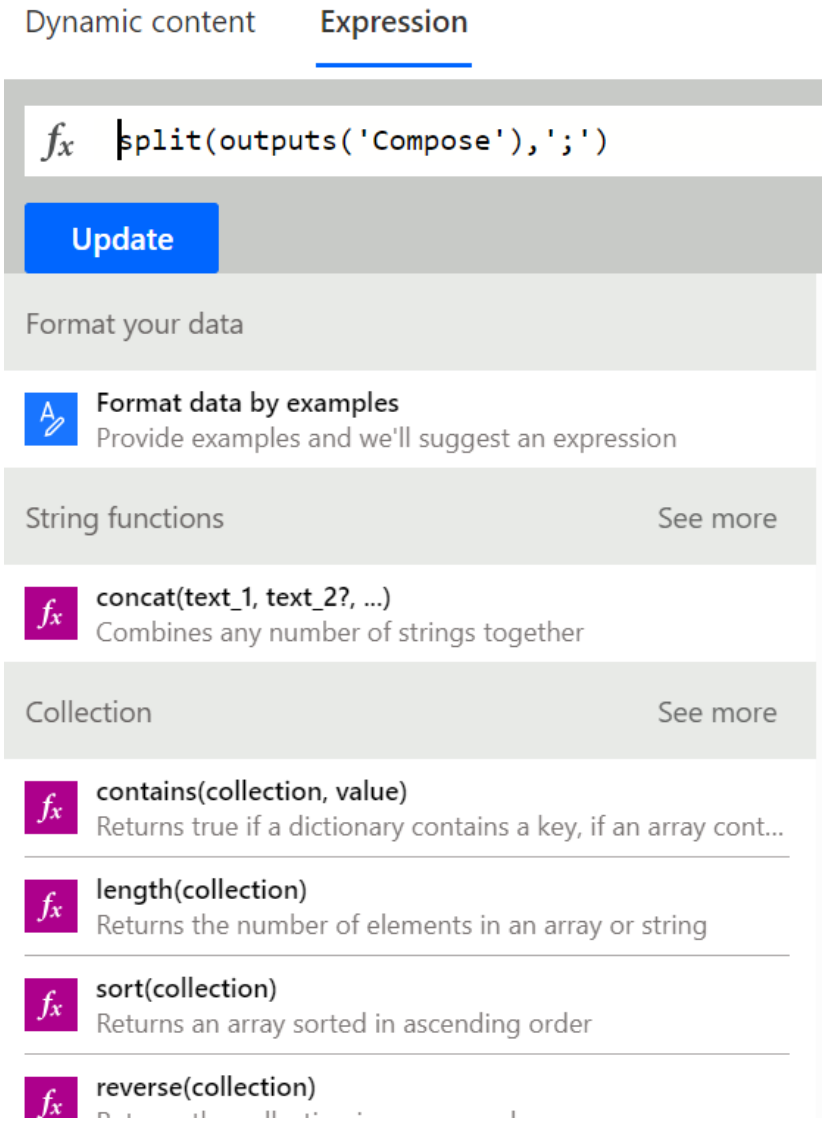
Run if not successful



Connector: any

You can define if a step should be run only upon some conditions, e.g., if the API call fails, has skipped, or timed out, then email a library staff to check

Data manipulation



Connector: any

As long as there's a field you can edit, you should be able to view this box to add Dynamic Content or manipulate earlier values.

In this example, my last Compose was a string separated by semi-colon (;) and I'm using the "split" function to make an array of values

E.g.

Original: "Accountancy;Law;Social Sciences"

After split:

```
{
    "Accountancy",
    "Law",
    "Social Sciences"
}
```

Hurdles, lessons learnt

If you are not the business owner of the process, it is most important to maintain regular communication with them to ensure you are also enhancing their experience and not only the patron

Learning Power Automate is almost like learning a new programming language

Limitations of Power Automate:

- Limited ability to nest, max of 8
- You have to use predefined connectors (although you can get creative)

Power Automate has a community of users you can rely on, there's a good chance what you want to do has been done by someone else, just got to find the right keywords

- Check More Resources

Future Plans

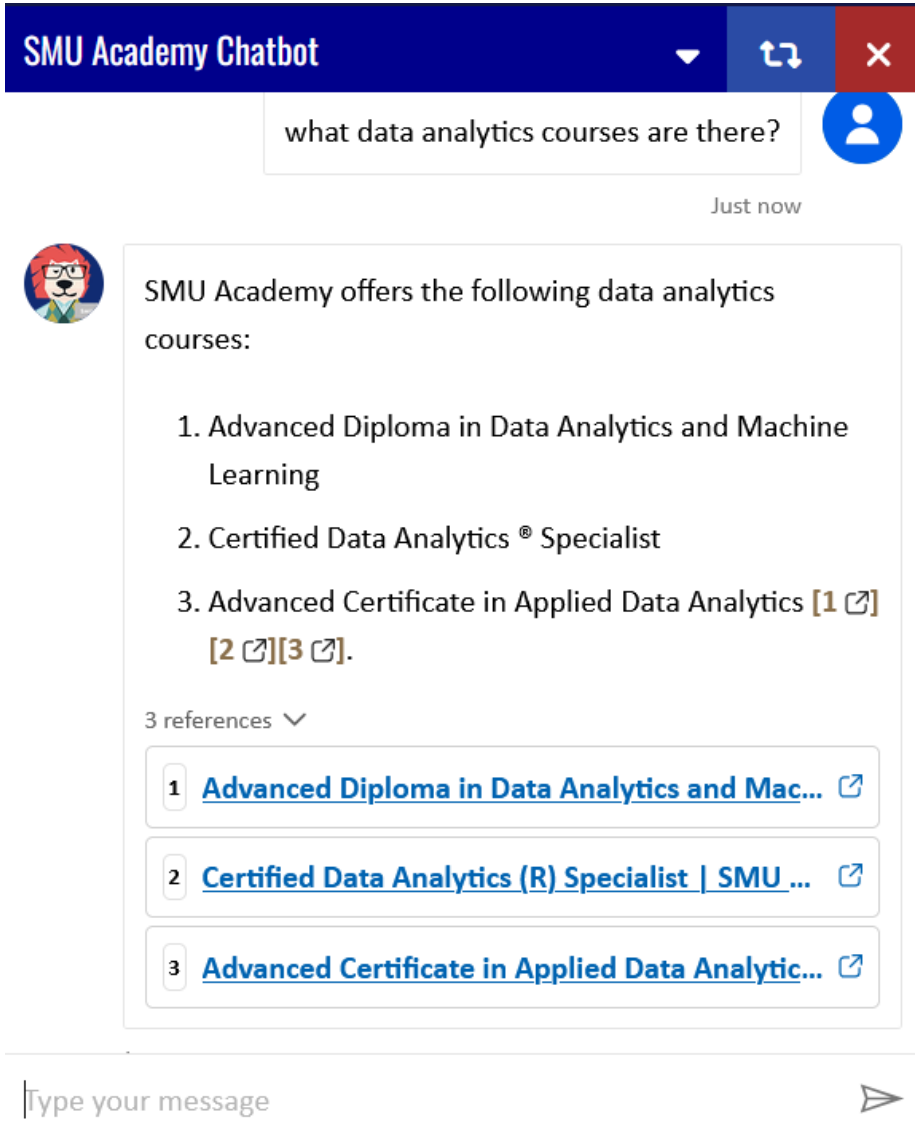
Copilot Studio

Example on the right shows a chatbot powered by Microsoft Copilot, customized to content from SMU Academy

SMU Libraries is also looking to explore this to integrate with our Springshare content (LibFAQ and LibAnswers knowledgebase) and replace our live chat

Current issues:

- Preparing the knowledgebase
- Managing expectations of users
- Figuring out test cases



Takeaways

Learning to code can be made a lot easier by using block coding

Understanding how AI works under the hood and being able to manipulate it yourself will be much more beneficial to you and your library compared to relying on an external party

After you learn the possibilities available to make the process more efficient, you may be tempted to look for other opportunities to do so but then it's important to remember that **User Experience** is the heart of what we do.

Always consider:

- Did you cover all cases? If not, how do you ensure your user has a chance to raise their case?
- Only collect information if you need it
- You do not have to automate everything, users appreciate a human touch

QUESTIONS?

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Find me on LinkedIn at
https://www.linkedin.com/in/samanthassc/

More resources

Trustworthy AI

Aspects of AI trustworthiness:

- Robustness e.g., dealing with errors or unexpected input
- Explainability e.g., understanding how the AI makes decisions
- Reproducibility e.g., able to re-create the same result
- Fairness e.g., avoiding systemic bias
- Designed with human agency and accountability from the beginning
- Respectful of privacy e.g., opt-in instead of opt-out, respecting robots.txt
- Transparent in meaningful ways
- Giving users control over their experience

How-to Power Automate

Let's POWER Automate, a great resource for doing very specific things: https://tomriha.com

YouTube channel, great for Microsoft Power Platform apps including Power Apps, Power Automate, Power BI, etc.: https://www.youtube.com/@RezaDorrani/videos

More on block coding

University of York subject guide on Coding has a page on Block Coding

Code Wizards HQ, an introduction and some example websites with block coding cases: https://www.codewizardshq.com/what-is-block-coding/