MACQUARIE University

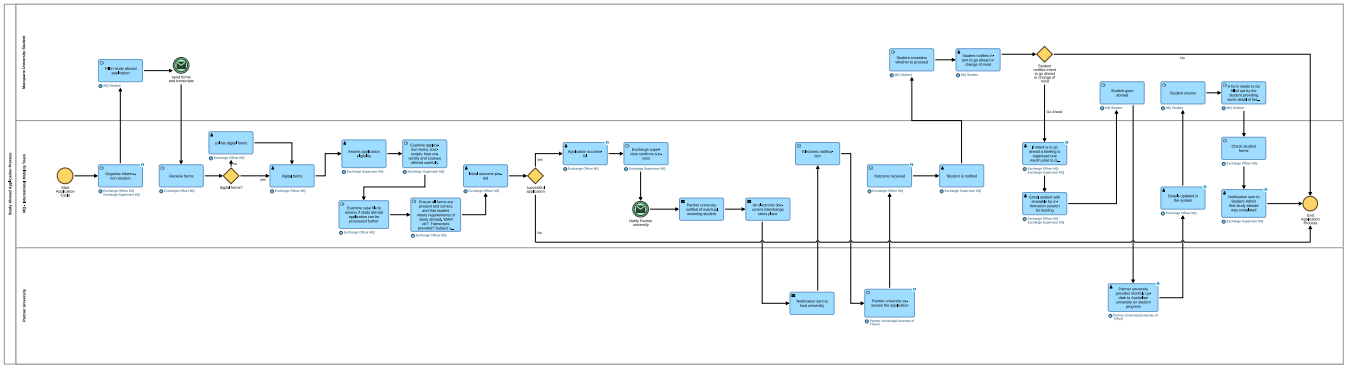
School of Computing

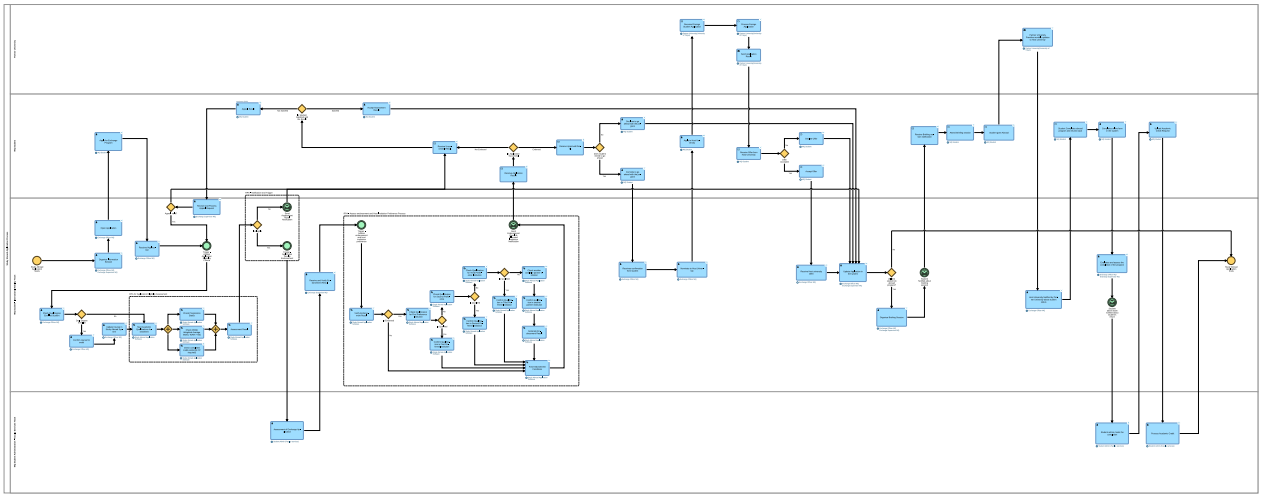
Semester 2, 2023

COMP6760: Enterprise Systems Integration

Assignment 2: BPM with (some?) Robotic Process Automation

Gino Sunny, 47814403





Involved Roles (RACI)

Type	Name	Responsible	Accountable	Cooperation	Inform
Role	Exchange Officer MQ	R			
Role	Exchange Supervisor MQ	R	A		
Role	Faculty Head		A	C	
Role	MQ Student	R			I
Role	Partner University(University of Tokyo)	R			
Role	Student Admin (Faculty services)	R			
Role	Study Abroad Application Software	R			

TO-BE MODEL – Process Improvement

The To-Be model is created along with the relevant cost associated with tasks.

The university assumed here is Macquarie University (MQ). The To-Be model encompasses 4 lanes as part of the Study Abroad Application system (pool) and each of these are;

- MQ Student Administration - Faculty Services Team
- MQ Student International Mobility Team
- MQ Student(Applicant)
- Partner University(Foreign University)

MQ Student Administration - Faculty Services Team

The student admin team mainly performs the assessment of the student application, validates the study abroad completion and processes academic credits after the study abroad program. This team comprises the student admin and faculty head.

MQ Student International Mobility Team

The mobility team mainly performs the automated eligibility assessment of the student application, orchestrates the entire study abroad application process, assessment of host institution preference and endorsement. This team comprises the exchange officer and exchange supervisor.

MQ Student (Applicant)

The student is the applicant who seeks the study abroad program.

Partner University (Foreign University)

The partner university is the university with which MQ has a direct relationship. The study abroad program is offered at the partner university. In this case, the partner university is chosen to be the University of Tokyo.

Process Improvement

The study abroad application process has been improved by removing manual and unwanted tasks and incorporating process automation whenever possible. The process structure for a study abroad application encompasses the core, support, and management procedures (Bachiller et al., 2022). The process architecture and detailed steps of the study abroad application system are described in detail (see Appendix 1). The As-Is model has sub-processes that incur extensive manual operation and are not connected to other applications (Bachiller, Busch and Smith, 2022). Based on the process architecture, the To-BE model has been created with the addition of new steps, eliminating manual operations, removing unnecessary tasks and process automation.

Robotic Process Automation

RPA has been incorporated into the To-Be model wherever possible. One technology employed to improve the study abroad process is robotic process automation (RPA) using Blue Prism (Bachiller et al., 2022). The RPA algorithm is used to automate the assessment of application eligibility in the model. However, a few tasks need to be performed by the mobility team to initiate the automated assessment process. This has been marked in the model diagram.

Using RPA, automated monotonous and effortless tasks, encompassing the tactical automation of various business functions. Before introducing this new functionality, the process relied on email, which was a procedure lacking student request tracking, leading to difficulties for both students and staff in terms of monitoring. RPA is capable of replicating manual process operations, possesses visual perception, can generate reports, and executes tasks independently, yet it falls short when it comes to handling intricate decision-making processes, particularly when students are enrolled in multiple degree programs, necessitating nuanced choices. To address this, a workaround was devised to monitor exceptions and validate decisions in cases where they cannot be accommodated within a rule-based workflow (Bachiller et al., 2022). RPA has been incorporated into the Assess Endorsement and Preference institution preference process (see Appendix 3). Similarly, RPA has been incorporated into the Application Eligibility Assessment process (see Appendix 4). These processes add Business Value to the whole process as the manual assessments can be eliminated and all the costs associated with the procurement of forms can be avoided.

1. How would you improve the processes?

The study abroad application process can be improved by removing manual and unwanted tasks and incorporating process automation whenever possible. The process structure for a study abroad application encompasses the core, support, and management procedures (Bachiller et al., 2022). The process architecture and detailed steps of the study abroad application system are described in detail (see Appendix 1). The AS-IS model has sub-processes that incur extensive manual operation and are not connected to other applications (Bachiller, Busch and Smith, 2022). Based on the process architecture, the To-BE model has been created with the addition of new steps, eliminating manual operations, removing unnecessary tasks and process automation.

2. What would you add?

New processes and their associated task has been incorporated into the To-Be model (see Appendix 2).

- Automated eligibility assessment process
- Automated student endorsement and host institution preference assessment.
- Triggers to initiate the endorsement process and student notification.
- Post-study credit application and processing.
- Student endorsement by the university faculty team.
- Academic credit approval by the faculty team.

3. What would you take away?

All manual activities that are done by the student international mobility team such as updating spreadsheets, and verifying physical forms, and questionnaires, are removed from the process. A few of the tasks from the process before improvement that were removed are added below,

1. Fill in the study abroad application
   - Fill in application form, attach transcript
2. Receive forms
   - If any forms are in paper format, digitize these and place in electronic folder. If in electronic form collate in the same folder
3. Assess application eligibility
   - Examine application forms, transcripts, host university and courses offered carefully.
4. Examine case file to assess if study abroad application can be processed further.
   - Ensure all forms are present and correct, and that student meets requirements of study abroad. WAM ok? Transcripts provided? Subject selection ok?
5. Initial outcome posted.
6. Exchange supervisor confirms success

7. Partner university notified of eventual incoming student
    - An electronic document interchange takes place
8. All the students' related costs are removed as it is assumed that there are no costs associated with a student.
9. Student notifies intent to go ahead or change of mind
    - Student emails or notifies study abroad team whether they still intend to pursue international study option
10. Notification sent to Student Admin that study abroad was completed

4. <u>What cost savings did you achieve and why?</u>

Within the study abroad team, there are various positions with differing salary structures. In a standard 35-hour work week for a study abroad application, there are 5 Exchange Advisers earning $45.00 per hour (resulting in a weekly total of $7,875.00) and 2 Exchange Coordinators who earn $52.00 per hour (amounting to $3,640.00 per week). Assuming a projected process improvement of 20%, the anticipated annual savings would amount to approximately $118,300.00 (Bachiller et al., 2022).

In the To-Be model, there are two roles created for the mobility team members specifically the Exchange Officer and Exchange Supervisor. The Hourly cost of the two role roles is added as $45.00 and $52.00.

Exchange Officer = 45$/hr

Exchange Supervisor = 52$/hr

Assuming all the other human roles created such as Student Admin, Faculty Head, and Student do not have an hourly cost associated with it.

It is assumed that the faculty team members Student Admin and Faculty Head are already employed at the university and they do not have a separate Hourly cost for performing mobility-related activities.

Total number of applications annually = 6900

Assuming the working days and hours/ day = 220 days, 8hr/day

The simulation parameters for the model would be then = 6900, 220, 8

The As-Is and To-Be models were simulated based on the above simulation parameters and the corresponding total costs were computed as follows (see Appendix 5 and 6).

Study Abroad Application Process Model (As-Is), Total costs = $116,615.51 ~ 116,616

Improved Study Abroad Application Process Model (To-Be), Total costs = $46413.19 ~ 46,413

“The development of RPA through robots or bots typically requires 3-4 months, depending on the complexity of the workflow requiring automation” (Bachiller, Busch and Smith, 2022).

The cost for a single bot (or unit) typically falls in the range of $5,000 to $15,000 on average. Nevertheless, according to HfS, the licensing component represents only 25-30% of the overall RPA expenditure (INFOGRAPHIC: How much does Robotic Process Automation (RPA) Really Cost? no date). The remaining 75% is comprised of a combination of the following elements:

- Annual renewal fees for RPA licenses.
- Expenses for training and potentially hiring internal subject matter experts (SMEs).
- Costs associated with consulting services for implementation, which may be provided by the RPA vendor or a third party.
- Set up expenses for the necessary infrastructure.
- Expenditures related to third-party integrations and renewals, including the cost of supplementary software like process mining and process discovery tools.
- Costs associated with addressing break-fix cycles, which can limit the full potential of RPAs and prove to be financially burdensome.

RPA Cost Breakdown Assumption (‘What is the Cost of RPA Implementation?’, no date))

Assuming for the To-Be model, 3 bot or unit is required = $10,000 x 3 = $30,000 (Development cost, one time).

Renewal fees for 3 bots/year = Average $3500 x 3 = $10,500.

One-time training cost = $5000

Implementation cost (one time) = $25000

Total one-time costs = $25,000 + $30,000 + $5000 = $60,000

Annual recurring costs = $10,500

Cost Improvement (%) = [(Cost of Current Process - Cost of Improved Process) / Cost of Current Process] x 100

**Cost of Current Process" represents the total cost associated with the As-Is process.

**Cost of Improved Process" represents the total cost associated with the To-Be process.

Cost Improvement after RPA Implementation.

Cost of Current Process = $116,616

Cost of Improved Process = $46,413+ $10500 (RPA costs) = $56,913

Cost Improvement (%) = [(116,616- 56,913)/ 116,616] x100 = **51.19 %**

How might RPA help?

RPA can be used to automate repetitive and rule-based tasks. This can significantly reduce manual effort and improve efficiency. RPA can also lead to cost savings by reducing the need for manual labor and minimizing errors, ultimately saving time and resources. The exact savings will depend on the scale of automation and the cost of RPA implementation. Users of RPA have encountered substantial advantages encompassing cost reduction, enhanced process precision, increased efficiency, improved adherence to regulations, diminished errors, accelerated reliability, and heightened user satisfaction (Khatib *et al.*, 2023). Regarding the workforce, RPA enables individuals engaged in routine tasks to transition into more valuable and productive roles (Khatib *et al.*, 2023). Additionally, RPA offers opportunities in professions such as robot management, analytics, and consulting.

References

Bachiller, Y., Busch, P. and Smith, S. (2022) 'Innovation through process automation: Factors for success', *ACIS 2022 Proceedings* [Preprint]. Available at: https://aisel.aisnet.org/acis2022/33.

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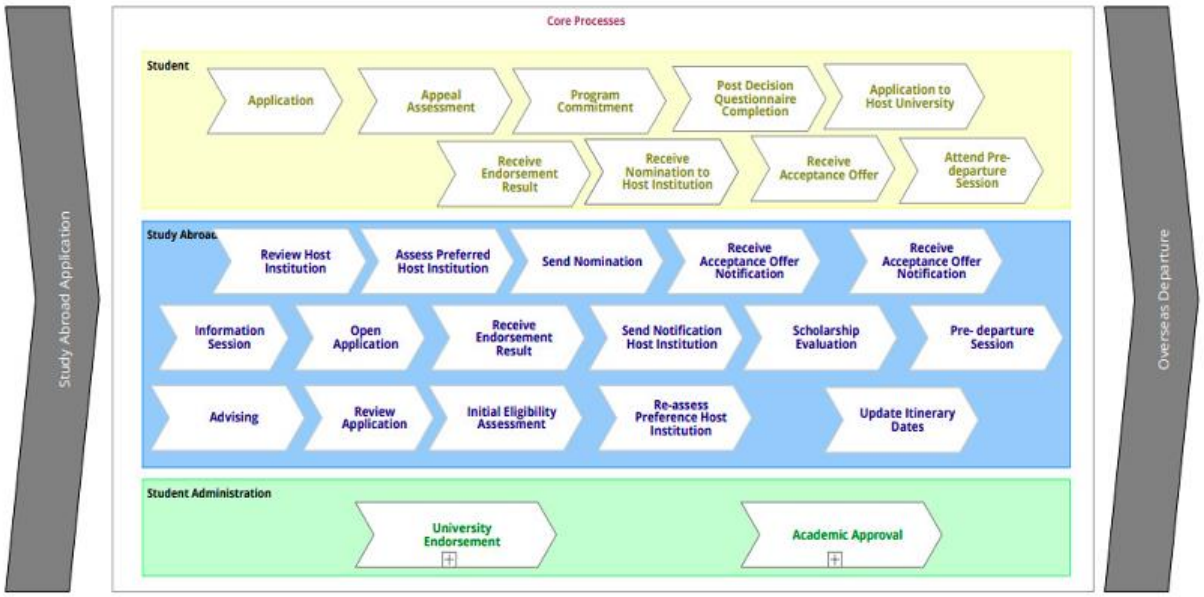
'What is the Cost of RPA Implementation?' (no date) *ByteScout*. Available at: https://bytescout.com/articles/cost-of-rpa-implementation (Accessed: 15 September 2023).

Appendices

Appendix 1: High-level study abroad application process (Bachiller et al., 2022)

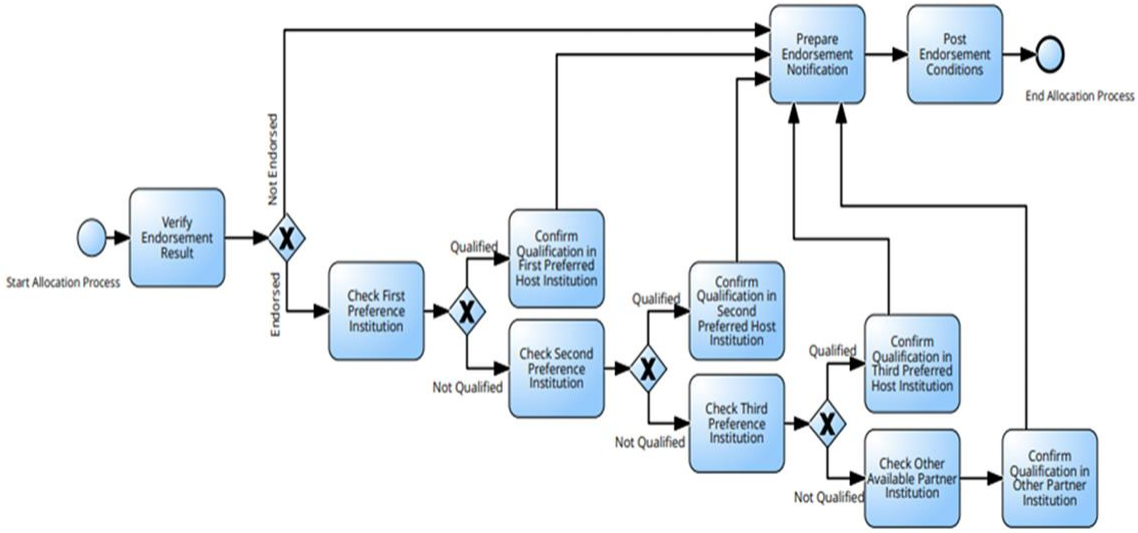


Appendix 2: High-level study abroad application process (Bachiller et al., 2022).

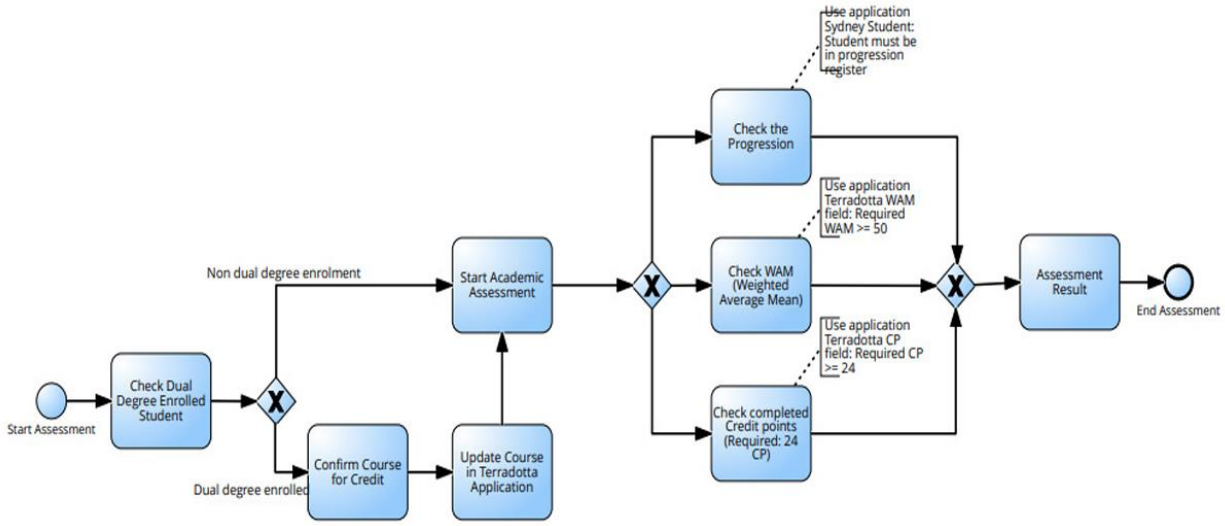
Main Task	Sub Task	Steps
Organize Information Session		Create schedule for Information Session
		Confirm Information session schedule with
		Post Information Session in Study Abroad
Received Exchange		Confirm latest release schedule of academic
		Confirm students for late exams exceptions
Assess Application - Academic Quals		Check enrolment status of the student in Student Information System
	Check Dual Enrolment	Open Study Abroad System
		Search student exchange application
		Check student profile in Study Abroad System - Student ID Course field
	Confirm Course for Credit	Check course to credit exchange in Study Abroad System student application
		Verify suitability of course for credit in
	Update Course in Study Abroad System	Copy Student ID Course student profile in Study Abroad System
		Paste Student ID Course in Student Details questionnaire in Study Abroad System
	Start Academic Quals	Open Sydney Student Information System
		Open Progression Register of the student in Student Information System
	Check Progression	Verify student progression status in Student Information System
		Note student progression status in Student Information System
	Check WAM (Weighted Average	Open the exchange application in Study Abroad System
		Check the student profile WAM field in Study Abroad System
		Note student WAM (>= 50 : Eligible for exchange / < 50 : Not eligible for exchange)
	Check completed credit points	Check the student profile completed credit points in Study Abroad System
		Note student completed credit points (CP >= 24 CP / CP < 24)
	Assessment Result	Confirm student is eligibility for exchange (In progression register and WAM >= 50 and completed CP >= 24)
		Confirm Student is non eligibility: (Not in progression register or WAM < 50 or
		Update student application status in Study Abroad System
Notify Unsuccessful Application		Select Unsuccessful email template in Study Abroad System
		Send unsuccessful email notification through Study Abroad System
Receive Appeal Request		Receive enquiry email from student through ServiceNow application
		Assess appeal request details
		Reply to student appeal result
Forward application for Student Administration		Open Study Abroad System
		Search exchange application of the student
		Add tag "FS Endorsement" in Study Abroad
Receive Endorsement Result		Receive email from Student Administration Exchange Team
		Open Study Abroad System application
		Open Endorsement Result questionnaire in Study Abroad Application
		Verify endorsement condition details

Main Task	Sub Task	Steps
Assess Endorsement and Host Institution Preference	Verify Endorsement Result	Verify Endorsement status: Approved for Endorsement for endorsed student
		Verify Endorsement status: Not Endorsed for unsuccessful student
	Check Quals for First Preference Institution	Verify course and major compatibility of student in first preference institution
		Verify applicant numbers and ranking in first preference institution
	Confirm Quals in First Preferred Institution	Confirm applicant suitability to first preference institution
		Place applicant to first preference institution
	Check Quals for Second Preference	Verify course and major compatibility of student in second preference institution
		Verify applicant numbers and ranking in second preference institution
	Confirm Quals in Second Preferred	Confirm applicant suitability to second preference institution
		Place applicant to second preference
	Check Quals for Third Preference Institution	Verify course and major compatibility of student in third preference institution
		Verify applicant numbers and ranking in third preference institution
	Confirm Quals in Third Preferred Host	Confirm applicant suitability to third preference institution
		Place applicant to third preference institution
	Check Other Available Partner Institution	Confirm applicant qualification if it doesn't match to first, second or third preference
		Verify course and major compatibility of student to other available partner institution
		Verify applicant numbers and ranking in other available partner institution
	Confirm Quals in Other Available Partner	Confirm applicant suitability to other available partner institution
		Place applicant to other available partner
	Prepare Endorsement Notification	Select email template for the application endorsement and institution allocation
		Send email notification of the application endorsement details through Study Abroad
Send Application Result Notification	Post Endorsement Conditions	Open Student Information System
		Open International Education application
		Post endorsement condition of the student
Receive Student Decision		Received notification that the applicant committed to the program
		Open study abroad application
		Confirm application status of the student in Study Abroad System
Nominate to Host		Open host institution website allocated to the
		Enter student details of the exchange
		Submit nomination to host institution
		Inform student to apply to host institution application website
		Update student application status in study abroad system
Receive Host Institution		Receive information from student on the offer
		Confirm host institution acceptance offer
Update Application		Open Study Abroad System
		Search applicant in Study Abroad System
		Confirm attachment of Host Institution
		Update student application status in Study Abroad System

Appendix 3: Assess endorsement and Host Institution Preference Process (Bachiller et al., 2022)



Appendix 4: Assess Application – Eligibility Criteria Process (Bachiller et al., 2022).



Appendix 5: Simulation Result Analysis: Study Abroad Application Process Model (As-Is)

Appendix 6: Simulation Result Analysis: Improved Study Abroad Application Process Model (To-Be)