RACE-PBA-SCT-11
Team Madagascar

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PROJECT 1 – GeBIZ (RPA-C-01 | Tracking of Tenders)

Industry Challenge: Automating tracking of business tender opportunities

Projects are the lifeblood of many enterprises and they are often issued as tenders by large multinational corporations (MNCs) or Government. Time and effort are usually spent monitoring or scanning through tender platforms such as GeBIZ (ThunderQuote). Furthermore, the specifications of the tenders are often hidden in attached documents prepared by client organisations and/or agencies, and going through this process can be tedious and time-consuming.

Project Reference:
https://www.gebiz.gov.sg
Log in with SingPass

Project-1 Overview:
Start 27 Apr 2022 (with project briefing)
End 25 May 2022 (with presentation and demo)

Contents

Revision History

Rev. #	Date	Section/Page#	Revision Summary	Author
1.0	15 May 2022	Full Document	Document created	- Laurent Jean-Claude Biale, - Roseline Ruba Durairaj, and - Pang Yan Kiat (AlfredP)

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Summary

This PROJECT 1 – GeBIZ (RPA-C-01 | Tracking of Tenders) is about applying elements of what learnt during the studies period and in particular on UiPath-Studio and "data-scrap" the GeBIZ website (https://gebiz.gov.sg) for Open and Closed Opportunities.

The team adopted the Design-Thinking approach and derived the Needs Statement (HMW) as:

> "(How Might We) use of RPA bot, these processes could be automated login (an option) to GeBIZ every day (and/or weekly) and extract the opportunities based on the defined keywords. Details of the extracted opportunities will be updated into an Excel spreadsheet for easy viewing, tracking and email to particular manager/person. The bot can also download all the quotation documents into Knowledge Management system like SharePoint or LiveLink for further collaboration. Furthermore, it can further create a calendar invite in Outlook to keep track of the tender closing date."

Ideas were generated and prioritised, prototype built and user-feedbacks (fellow team member, as there is no real client in this case) obtained. The "testing" was particularly crucial as the targeted website was not clearly structured – at least from team initial understanding and inexperience encounters. The team had decided on its solution platform:

- A Window-base desktop;
- With UiPath-Studio scraping on "gebiz.gov.sg" site;
- This could be with either with/without SingPass login.;
- If time permits, may be built upon UiPath-Orchestrator for "Unattended/Attended/Hybrid" implementation/s.
- Email system for sending specific reports/ info to targeted project-managers

As the project classes were Mon-Wed and working remotely otherwise, the given requirements on using of UIPath-Studio, documentations, Blog and project's report; it was identified that GitHub and GitHub-Pages would be an ideal common working platform for all members and later presented as outcomes.

The team faced several challenges, such as in Human/ Team Factor, in Schedule and particularly difficult was in Technical – on use of UiPath, data-scrap on GeBIZ and learning GitHub more fully.

On costs, a similar project such as this one would have an upfront cost of S$1,500 – 2,000. In savings of time, money and/or lives; this would depend very much on the company need/s of the information/ details on GeBIZ and equivalence savings of the manual system. For example, if the company utilized by 2-5 persons, person-hour slaughtering through the gebiz.gov.sg website, this will be multiplied in accordance to each person x2-5hr by $ per hour of the individuals. This "time/money" factor again in multiples in accordance to extended functions and capabilities, such as on use of dashboards and use of data analytics in provision of insights and knowledge to both individuals and groups-in-needs.

The team has made the following recommendations for future improvements: a) use of login only when needed and/or for specific functions; b) use of selective/ targeted informed keyword/s for recognise areas of interest with individuals, departments, and/or managers; and directed email/ channelled information, with controlled receivers of scope/s; and building of desired knowledgebase; c) timely ongoing scrap/s (probably weekly); and d) incorporating extension to data analytics/ dashboarding system.

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1. Design Thinking

As this is our first project and all members are still new in using UiPath-Studio, the team has decided to approach this project from 2 prongs and converging to one after the initial stages.
- First is to get all members to focus on project's "Pain and Smile" points and
- Second for all team members to be more familiar on use of UiPath-Studio.

On first, as this project has no real customer and none of the members has actually use GeBIZ, the team has went about to use and understand of GeBIZ. On latter, each members were to start building their first prototypes of their own, as each saw fitful and to decide on one before starting any common substantial development.

GeBIZ is Singapore Government's main one-stop e-procurement portal. All public sector's invitations for quotations and tenders are posted on GeBIZ. Suppliers can search for government procurement opportunities, download tender documents, submit their bids online and manage opportunities. On secondary, probably could be used as a knowledgebase for competitive analysis and future bidding, on suppliers who are under Government Supplier registered, those that bided on closed opportunities, bided prices and awarded bidders.

Some of the details including:
- Reference index on if an opportunity is for Tender (legal award), Quotation (non-legal award) and/or Qualification (non-legal award);
- Title of opportunity, awarding agency, published and closing dates, procurement category and submission types (electronic or manual);
- If requiring of "Site Briefing", date and its requirements and details;
- Documents (and specifications of qualifications/requirements): Requires login with For Companies and/or Individuals with SingPass or GeBIZ ID (Sign u) for foreigners without SingPass;
- Contact details;
- Key "Items Ro Respond" (unit of measurement, quantity, etc.) with a particular opportunity

a) Empathise – Persona (Pain and Smile Points)
The team has identified some key "Pain and Smile" points:
- The "gebiz.gov.sg" portal by itself is already very comprehensive for its purposes and direct individual usage;
- As the portal is an individual logon, much information within are view only by individual, hence certain details could be scraped by the individual and disseminated/ communicated/ extended to others (probably controlled, as the company intent scopes of opportunities;
- Certain details on closed opportunities could be collated as companies knowledgebase for use on competitors whether as benchmarks, on biddings and awards pricing, etc.
- These information, its analysis and/or intent may be are strategic in nature within group/s and within company;
- For a project manager/ professional, searching for GeBIZ opportunities tends to be a rather manual process. Even worse, the process of consolidating and tracking the opportunities can be tedious and time-consuming. Precious time is wasted on performing such administrative work instead of preparing for a winning bid. In addition, much info could be gather for, planned and exercised as company's knowledgebase and communication purpose; and
- On "Log in with SingPass", care got to be taken on its use and considerations of both security measures and privacy. Probably, this should be avoided unless really necessary. There are such available measures as use of "credential" control at local (generic) and central (Orchestrator) locations.

b) Define – Needs Statement (How Might We.. For.. So that..)

With RPA, the bot could automatically login (an option) to GeBIZ every day (and/or weekly) and extract the opportunities based on the defined keywords. Details of the extracted opportunities will be updated into an Excel spreadsheet for easy viewing, tracking and email to particular manager/person. The bot can also download all the quotation documents into Knowledge Management system like SharePoint or LiveLink for further collaboration. Furthermore, it can further create a calendar invite in Outlook to keep track of the tender closing date.

c) Ideate – Generate and Prioritise Ideas

As this is our first mini-project and time constraint, team Madagascar would do the minimum:
- Provide necessary search options;
- Extract Reference index within the scope of search;
- Extract necessary info and details

Ideas:

GeBIZ (https://www.gebiz.gov.sg), a one-stop Singapore web-portal provides information on "Open/ Closed" opportunities to the public as tenders, qualifications and/or quotations. On its own, the portal is already a very comprehensive site for information, specifications (downloadable documents) and instructions for interested parties.

However, this requires individual to search through for the necessary information.
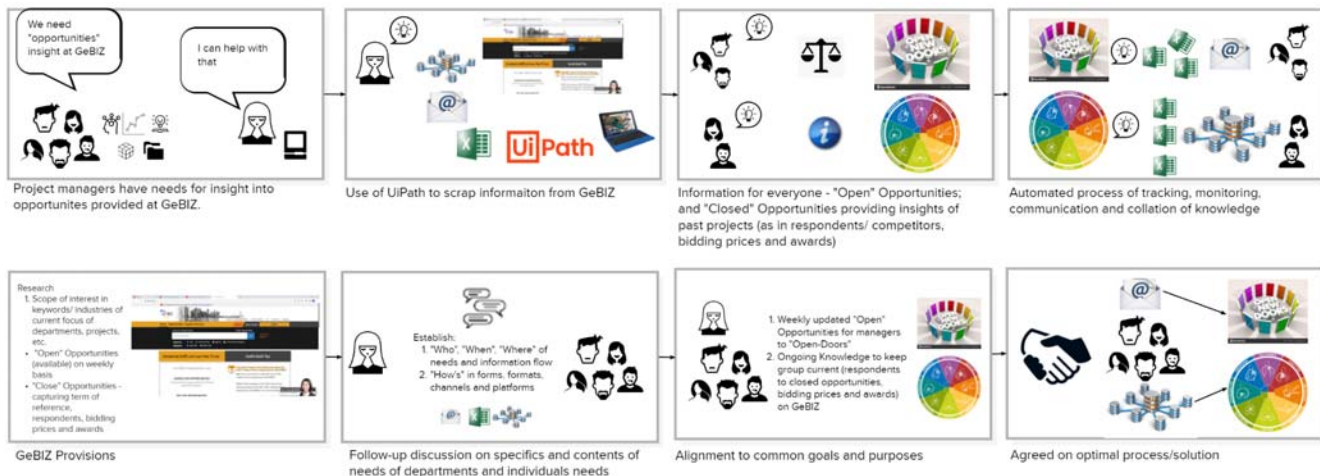In order to full benefit from this site, a company requires a dedicated staff to search through relevant details and share/ communicate them with managers and designated personnel.

After some exploration with "gebiz.gov.sg", team members return with ideas:

- Search of keyword/s;
- Options for varying search;
- Open/ Closed Opportunities;
- Open Opportunities – providing specific links for departments/ designated managers to explore further;
- Closed Opportunities – as inputs to departments/ designated managers in building their knowledgebase for monitoring and tracking (consisting titles, descriptions, respondents, bidding prices and awarded)
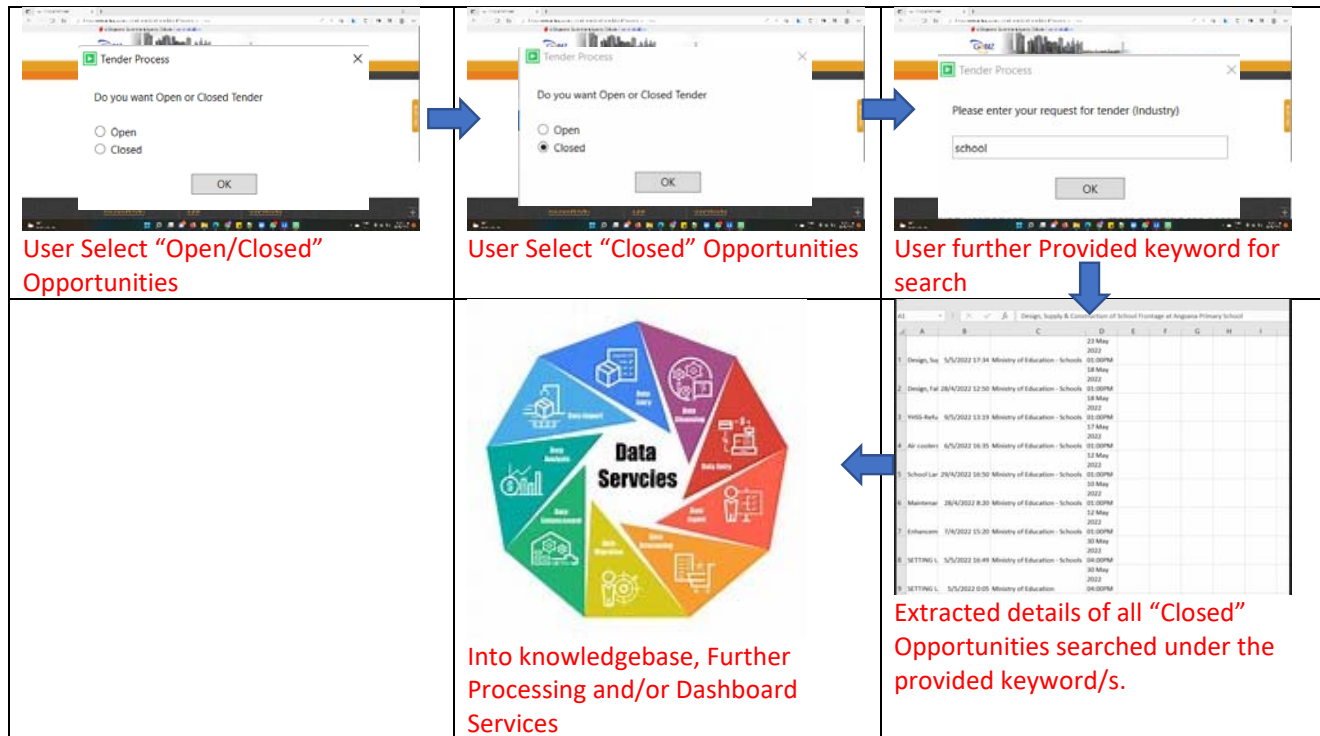
Storyboarding:

Raw ideas on the What's and How's Opportunities-Lead (on weekly basis) has a range of scopes (keywords-HDB, Green, Security, etc.) to search through:

Project managers have needs for insight into opportunites provided at GeBIZ.

Use of UiPath to scrap informaiton from GeBIZ

Information for everyone - "Open" Opportunities; and "Closed" Opportunities providing insights of past projects (as in respondents/ competitors, bidding prices and awards)

Automated process of tracking, monitoring, communication and collation of knowledge

GeBIZ Provisions

Follow-up discussion on specifics and contents of needs of departments and individuals needs

Alignment to common goals and purposes

Agreed on optimal process/solution

d) Prototype

The development will be built in parts/ modules integrating to form a system of functions/capabilities:
- On simple user-window's dialogue;
- In-built data scraping tool;
- Excel-spreadsheets of requested scope/ keyword; and
- Stored/ sent to specifics users' of interest in the scopes/ keywords.

User Select "Open/Closed" Opportunities	User Select "Closed" Opportunities	User further Provided keyword for search
	Into knowledgebase, Further Processing and/or Dashboard Services	Extracted details of all "Closed" Opportunities searched under the provided keyword/s.

User Feedback:

Likes:	Criticisms:
Scope encompassing Open and Closed opportunities;	Unclear on system, if catering for single and/or multi-users?
Questions: Suggest on Information's provided for: Open Projects? • Tender/Quotation number (Reference Index) • Project title • Agency • Published day • Offer validity Duration • Closing on (Date + Time) • Procurement Type • Quotation Type • Procurement Nature • Procurement Method • Payment Terms • Procurement Category • Who to contact (details of the PIC)	**Ideas:** - If there is any need to request email address from user? Probably not, as users (project/ departmental managers) are known; but info stored on config files. - Can we send the final report to several people? If yes, how many? - On reports the system will provide and - If report/s format be other than Excel?

• List of items to respond (Item Number + name of the item + Unit of measurement + required quantities + Delivery location + Delivery date) • Remarks <u>Closed Projects?</u> • Tender/Quotation number • Project title • Agency • Published day • Status: (Pending award, Awarded, Cancelled, Not awarded) • Closed on (Date + Time) • Procurement Type • Tender/Quotation Type • Procurement Nature • Procurement Method • Payment Terms • Procurement Category • Respondent -> List of Respondent + Tender value $$ • Award -> Name of the awarded + Total awarded value $$	

e) Test – On Exception

A set of controlled data will be collated during and in progress of the development for testing of the system "corners and boundaries", and use for further testing and building of test-cases.

The team had several issues in Scrap and/or GetText of the GeBIZ website, such as:

Item	Test on Exception	Remarks
a)	As data on GeBiz were not present at all consistent and/or structured, it was difficult to scrap – making known testing-cases is crucial;	Had to use go-around method/s in handling/ scrap and conscious of errors.
b)	Accurate count of item/s scrap to actual, handling of next-page is sensitive and leading to missed and data accurately (chances of scraping only first page, missing out on remaining);	Cross-checking and corrective action taken on case-by-case when necessary, for example on "hdb" returning 44 Open Opportunities items scrapped on 10 items (only first page taken)
c)	Here are some test-cases requiring attentions:	
	i. When "Open" Opportunities with 0 (zero) listed;	Requires checking and handling of exception with alert-dialogue of "no item found".
	ii. When use of keyword such as "rpa" returns gibberish;	Could return such item as "carpark", hence added ".." seem to have resolved this situation.
	iii. Keyword returning items with "Corrigendum", publish of "corrected info" – hence upsetting consistency of display table/s (throw workflow on runtime error;	This is part of GeBIZ in handling publish- "corrected info", but may be resolve in using different scraping techniques.
d)	Need to handle "Logout" of GeBIZ when task/s completed; etc.	Requires handling.

f) What platform will you be using?

Team Madagascar will only focus on:
- A Window-base desktop;
- With UiPath-Studio scraping on "gebiz.gov.sg" site;
- This could be with either with/without SingPass login.;
- UiPath-Assistant/ UiPath-Orchestrator for "Unattended/ Attended/ Hybrid Operation;
- Email system for sending specific reports/ info to targeted project-managers and/or storage; and
- GitHub and Github-Pages

Application/s Used:
The table below includes a comprehensive list of all the applications that are used as part of the process to be automated to perform the given actions in the flow.

Application Name	Version	Application Language	Thin/ Thick Client	Environment/ Access method	Remarks
GeBIZ.gov.sg	Version 101.0.4951.67 (Official Build) (64-bit)	English	Thin	Web browser (either Google Chrome/ Windows Edge)	-
MS Excel	2019	English	Thick	Desktop	
SMTP/ via MS Outlook	2019	English	Thick	Desktop	-

Even though the project and/or development was in focus of using UiPath-Studio, it is crucial to put in context and consideration of a bigger picture of things/ environment of the application.
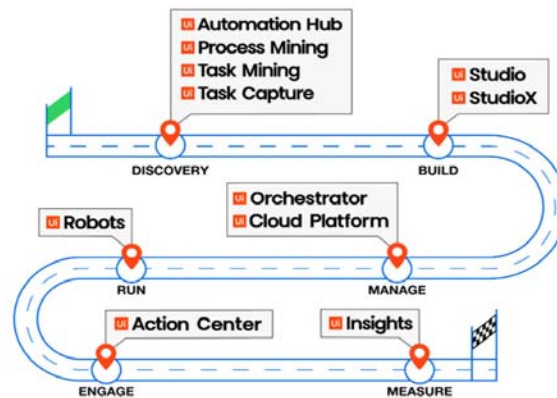
g) GitHub and GitHub-Pages

During studies-period (module on RPA-UiPath), the GitHub platform was introduced as a version control system and it allows for seamless collaboration with necessary controls over security, integrity and tracking of development of projects. It allows one to work together on projects from anywhere.

Team Madagascar saw the usefulness and decided to use it for the development and documentation of our Project-GeBIZ, so as to learn more of its extend and benefits. Here are some main benefits of using GitHub:
1. **It makes it easy for participants to contribute to the project**, nevertheless, owing to its comprehensiveness and complexity, the team struggled through a steep-learning-curve;

2. **Documentation**. By using GitHub, team Madagascar documented:
   - Team members are able to learn about ***tracking and observing the direction of development***;
   - The UiPath solution is explained on its ***in-built README.md***
   - **Blog**. "GitHub-Pages" provides the facilities, from the GitHub repository (per project) for editing and pushing changes live on Project-Blog site.
3. **Showcase of work**. Team Madagascar is able to showcase the project during presentation.
4. **Markdown**. Team Madagascar is able to further our learning on the Markdown language/ system and for future development purposes;
5. **GitHub is a Repository**. It is a repository and a good one too, but not sure about the exposure and being out there in front of the public. Nevertheless excellent exposure team Madagascar and members on one of the largest software coding communities;
6. **Track changes in code** (in our case the .xaml and project entities) **across versions**. When multiple people collaborate on a project, it's hard to keep track revisions—who changed what, when, and where those files are stored. GitHub takes care of this problem by keeping track of all the changes that have been pushed to the repository, with a version history of the code so that previous versions are not lost with every iteration.
   (posed some difficulties for Team Madagascar member as beginners)
7. **Integration Options**. It works well with UiPath-Studio, team Madagascar is able to publish UiPath-Studio ***solution on Open-platform***, and yet able to ***access directly on individual members desktop development*** UiPath-Studio
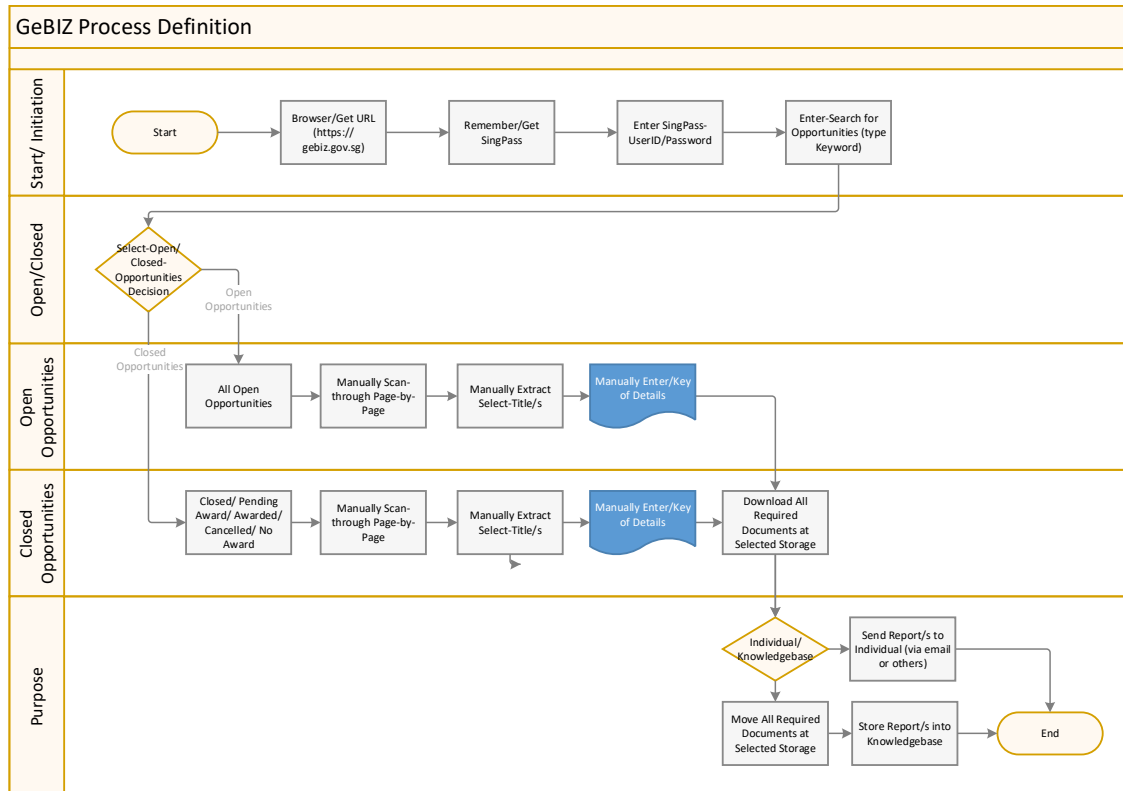
2. Articulation of Challenge Statement: As-Is

Given above context,

> "Manager A, managing a busy and dynamic business, needs to monitor and keep track of opportunities (both open and closed) on "gebiz.gov.sg" because he wants to stay on-top of:
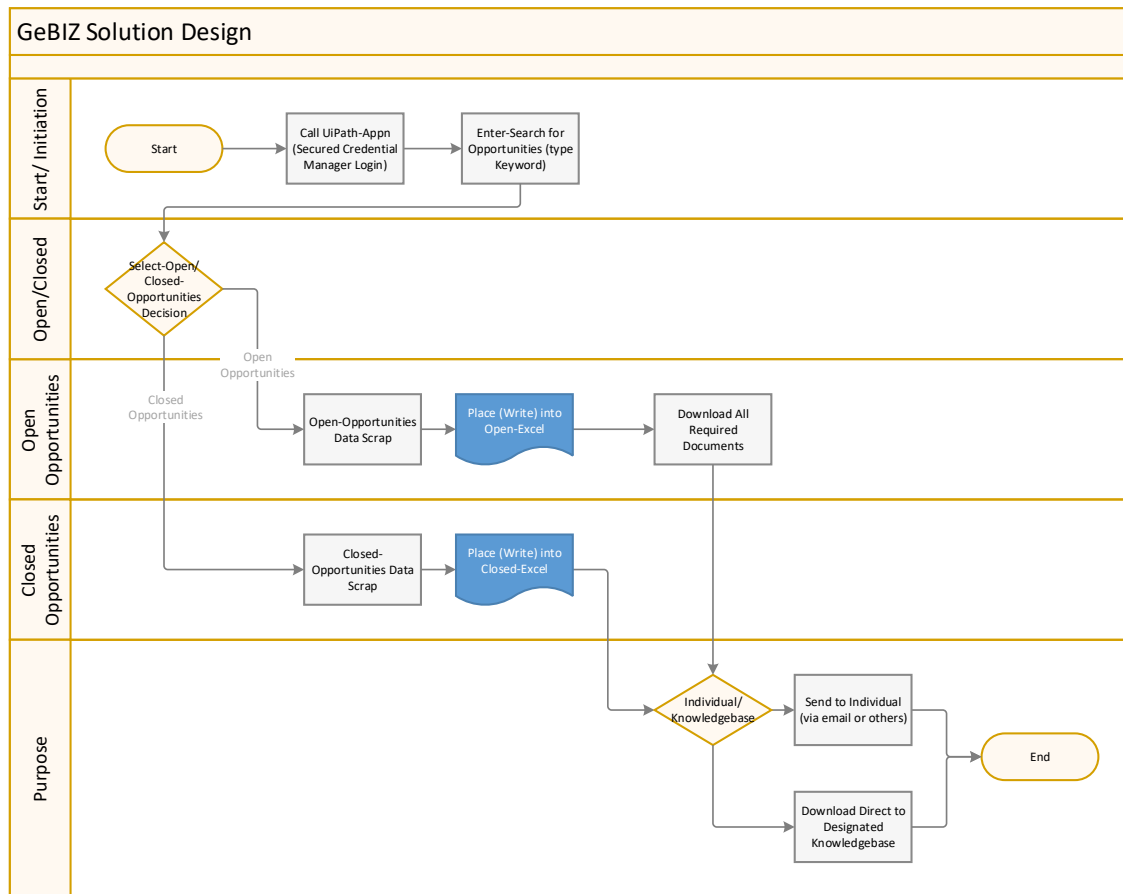> 1. Available opportunities/ projects and
> 2. Be able to keep his/her "ear-on-the-ground" on competitors, bidding-prices and awards."

Process Definition:

Step	Short Description
1.	GeBIZ (https://gebiz.gov.sg)
2.	User Login with SingPass
3.	Search for Opportunities
4.	Decision of Open/ Closed Opportunities
Open Opportunities	
a.	Tenders (a contract is made when an offer is accepted)/ Quotations (not offer as legal sense)/ Qualifications (for cases that only Pre-Qualified supplier is allow to submit tender)
b.	Manual extraction of details
c.	Place details in a report (or Excel Spreadsheet)
d.	Download All Required Documents
Closed Opportunities	
a.	Closed/ Pending Award/ Awarded/ Cancelled/ No Award
b.	Manual extraction of details
c.	Place details in a report (or Excel Spreadsheet)
Purpose	
5.	Decide if for Individual/ Knowledgebase
a.	Individual – Send relevant info to project managers via Outlook-email and/or direct SMTP.
b.	Direct to knowledgebase for storage/ further processing (Dashboard)

Solution Design:

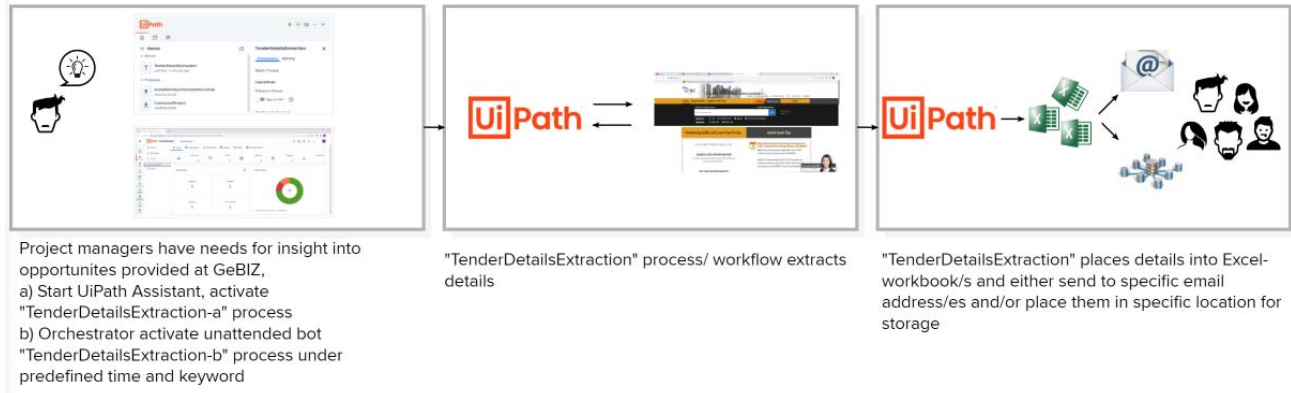| Step	Short Description
1.	System call upon GeBIZ (https://gebiz.gov.sg) Main.xaml
2.	In accordance to User-Machine Login with SingPass (could further customised for individual and secured with Credential Manager either within Windows/ Orchestrator) UserCredential.xaml
3.	User Respond by typing in "Search for Opportunities" keyword/s
4.	User Select on Open/ Closed Opportunities
Open Opportunities (OpenDataScrap.xaml)	
a.	UiPath Data Scrap All Tenders (a contract is made when an offer is accepted)/ Quotations (not offer as legal sense)/ Qualifications (for cases that only Pre-Qualified supplier is allow to submit tender)
b.	Place details in a report (or Excel Spreadsheet) (WriteToOpenExcel.xaml/ to knowledgebase)
c.	Download All Required Documents
Closed Opportunities (ClosedDataScrap.xaml)	
a.	UiPath Data Scrap All Closed/ Pending Award/ Awarded/ Cancelled/ No Award
b.	Place details in a report (or Excel Spreadsheet) (WriteToClosedExcel.xaml/ to knowledgebase)
Purpose	
5.	User Decide if for Individual/ Knowledgebase (UserInput.xaml)
a.	Individual – Send relevant info to project managers via Outlook-email and/or direct SMTP (SendDetailsToEmail.xaml)
b.	Direct to knowledgebase for storage/ further processing (Dashboard)

3. Your Solution and how it evolved across multiple iterations

Details of project evolvement can be tracked through weekly updates in "Project Progression – Madagascar Report", here are highlight of its evolvement and iterations:

Multiple Iteration

S/N	Solution-Iteration	Dated	Remarks
1.	It was decided that individual make attempt on their own cut of prototype-solution. With user search-request; - Scrap on Open opportunities, extract/filter specifically on opportunities Reference-index (RefIndex) for further extraction; - Scrap of Closed opportunities and its secondary details in respondents, biding price and award information. Prototypes with and without "login" as only downloading of documents required login. Varying approaches to scraping, team members encountered difficulties with data-scrap	Week-1	For all members of the team to get familiar with both "gebiz.gov.sg" and use of UiPath-Studio for the project; as all team members are keen to try out their newly acquired skills on UiPath.
2.	Decided on standard use of "login" with SingPass secure by Credential Manager. Ideal approach is to first extract and filter each "Reference-Index" before getting into titles and details. All members concurred.	Week-2	Seemingly overcame difficulties in scraping of selected items of the details.
3.	With decided approach, able to expand and further project scope and functionalities: - "Closed" Opportunities with different categories of Closed/ Pending Award/ Awarded/ Cancelled/ No Award - Listing of "Open" Opportunities in Reference-Index and items of interest; nad - Downloading of all required documents and email to managers.	Week-3	The Project-1 consists of 5 items: a) Weekly Progress Report b) UiPath Prototype c) "PROJECT 1 – GeBIZ (RPA-C-01 | Tracking of Tenders)" d) Demo-Video e) Blog/ Readme.md on GitHub
4.	All above were developed under UiPath-Studio on GitHub and Git-Pages	Week-4	Pulling all together
5.	Publishing UiPath-Studio development onto UiPath Assistant requires absolute file-reference. (C:\Users\alfred\Documents\UiPath\GeBIZ_20220602\output as when reference on UiPath Assistant C:\Users\alfred\.nuget\packages\tenderdetailsextraction\1.0.1-alpha.1\lib\net45\output)	Week-4	Similarly when activated on Orchestrator, must consider environment reference.

Final Solution:

Project managers have needs for insight into opportunites provided at GeBIZ,
a) Start UiPath Assistant, activate "TenderDetailsExtraction-a" process
b) Orchestrator activate unattended bot "TenderDetailsExtraction-b" process under predefined time and keyword

"TenderDetailsExtraction" process/ workflow extracts details

"TenderDetailsExtraction" places details into Excel-workbook/s and either send to specific email address/es and/or place them in specific location for storage

S/N	Function/ Sub-Function	Remarks
1	Start/ Initiation	
	a) Call GeBIZ on Browser	https://gebiz.gov.sg
	b) Credential Manager	SingPass (Secured)
	c) Input Dialog	Enter Keyword Search
	d) Input Dialog	Open/ Closed Opportunities
2	Open Opportunities	
	a) Extract Open Opportunities Item List	Write to Excel-file (To Output)
	b) Extract Open Opportunities Item Details - Reference from Item-List	Write to Excel-file (To Output)
3	Download All "Tender Documents"	Save to Download/ specific location
4	Closed Opportunities	
	a) Closed Opportunities Item List	Write to Excel-file (To Output)
	b) Extract Item Details - Reference from Item-List	Write to Excel-file (To Output)
5	Email Excel-file to Specific Individual	
	a) Enter Specific Email Address	User Entry
	b) SMTP Send Excel-file to Specific Email Address	SMTP Send

# 4. Challenges faced by team and how your team overcome it

Aspects	Description	Remarks
A. Human/ Team Factor	There were several challenges faced by the team. It was obvious from day-one that the team was makeup of members with different levels of technical and literal capacities, and most of all willingness, agendas and aptitudes.	Applying of open-discussion and voting were excellent techniques in assisting team in moving forward and progressing with the project. Nevertheless, this could carry on thus far or not so far, as project work is about contribution and pushing each other and individual members forward. Teamwork has never been "dragging each other to failure," and completing the tasks on hand.
	On first day of project-brief, there were 4 participants and second week another one had dropout (remaining 3, as another 1 found job) and team memberships had to be rearranged to makeup two balanced team. This creating issues with team dynamics and morale – breaking confidence and enthusiasm.	This is not helpful, taking into consideration of above item. It was good to have several public-holidays and in-between modules (Team Leadership and Career-Level-Up) breaks giving time for team members to work through issues.
	In week-3 another dropout, 2 members remaining. It was appreciated that the dropping out member assisted on completing all tasks before handing over.	Yet another setback, as there were much workload for remaining 2x members.
B. Schedule and specification	In all projects, it is always good to have clear policies (like for example, not allowing dropout during project duration), schedule and specifications (project scope and expected outcomes) should have been made clear at outset.	Team made adjustment, refer to changes and evolving schedule. Refer to changes and evolving of schedules below:
	Week-1:	

Week-2

Task	Start date	End date
P1	Apr-27	May 6
P2	Apr-27	May 6
P3	Apr-27	May 6
Integrated P	May 9	Jun 6
Presentation	Jun 7	Jun 8

Task	Startonday	Duration
P1	0	9
P2	0	9
P3	0	9
Integrated P	10	28
Presentation	39	1

Note: 1 team member dropout

Project GeBIZ Wk1 (chart: P1, P2, P3, Integrated ProjGeBIZ, Presentation vs Start on day 0–50)
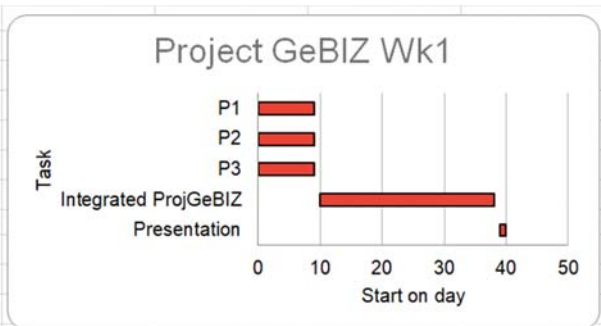
Week-3

Task	Start date	End date
P1	Apr-27	May 6
P2	Apr-27	May 6
P3	Apr-27	May 6
Integrated ProjGe	May 9	Jun 6
Weekly Progress	Apr 27	Jun 6
Project-Report	May 9	Jun 6
GitHub-GitPages(	May 9	Jun 6
Presentation	Jun 7	Jun 8

Task	StartOnDay	Duration
P1	0	9
P2	0	9
P3	0	9
Integrated ProjGe	10	28
Weekly Progress	0	28
Project-Report	10	28
GitHub-GitPages(	10	28
Presentation	39	1

Note: 3 members team

Project GeBIZ Wk1-4 (chart: P1, P2, P3, Integrated ProjGeBIZ, Weekly Progress, Project-Report, GitHub-GitPages(WebBlog), Presentation vs Start on day 0–45)
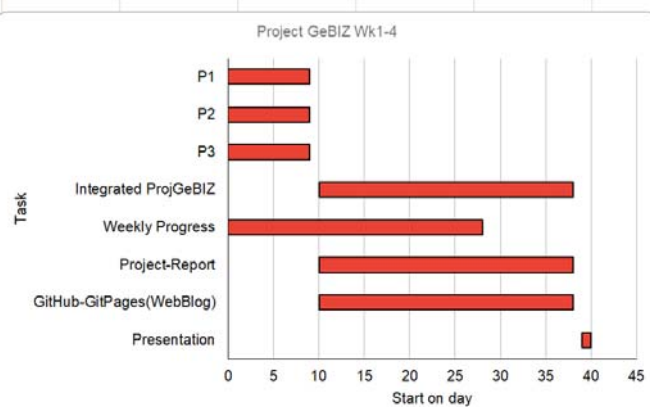
Week-4

Task	Start date	End date
P1	Apr-27	May 6
P2	Apr-27	May 6
P3	Apr-27	May 6
Integrated ProjGe	May 9	Jun 6
Weekly Progress	Apr 27	Jun 6
Project-Report	May 9	Jun 6
GitHub-GitPages(	May 9	Jun 6
Video-Demo	Jun 2	Jun 6
Presentation	Jun 7	Jun 8

Task	StartOnDay	Duration
P1	0	9
P2	0	9
P3	0	9
Integrated ProjGe	10	28
Weekly Progress	0	40
Project-Report	10	28
GitHub-GitPages(	10	28
Video-Demo	31	4
Presentation	39	1

Note: 1 member dropout on 31 May, remaining 2

Project GeBIZ Wk1-4 (chart: P1, P2, P3, Integrated ProjGeBIZ, Weekly Progress, Project-Report, GitHub-GitPages(WebBlogg), Video-Demo, Presentation vs Start on day 0–45)
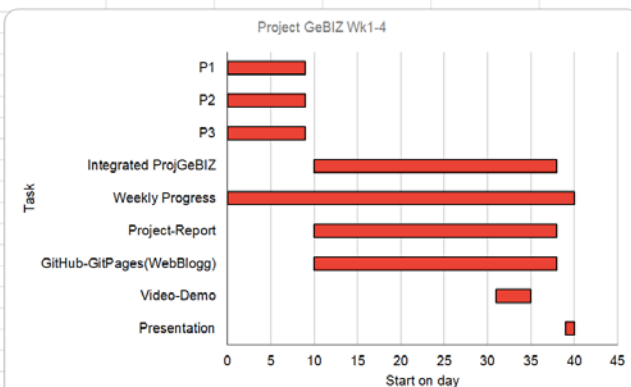
C. Technical	UiPath-Studio As this is first time all participants have just learnt UiPath-Studio, it was difficult to just apply what was learnt on this real project.	It may be good to have some technical expert advices and in guiding (or to the extent of "hand-holding") team progress.
	GeBIZ website This GeBIZ website is difficult one for beginner, not clearly	Need more time and work on and understand domain (issues with Corrigendum, search context ".." , '..' and without). The team had put additional

	structured for easy data-scrapping to apply.	effort on applying several go-around in solving and overcome difficulties.
	GitHub and Git-Pages During "Training Phase" of RPA-UiPath-Studio, was the team first encounter of GitHub, lessons was focused more on version control and little understanding of the GitHub platform and its features. Challenges in learning about and further applying/use of: - GitHub for team-collaboration - Git-Pages for development website	Self-motivated and learning of new skills
	SMTP on Google/ Yahoo Mail Both providers have stopped (only recently) allowing less secure app access, hence posed difficulties on using SMTP.	Use "less-restrictive" server (setting "none" at UiPath SMTP-properties)

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5. How much time/money/lives your Solution saves

S/N	Item	Manual Cost	Automated Cost	Savings	Remarks
1.	Cost/ payment similar development		S$1,500		Such typical projects/jobs, on software development market average about 5 days and costing between S$1,500 - 2,000.
2.	Per person Cost (4hrs@S$60/hr per week for a month over **6 month**)	S$5,760		S$4,260	This is immediate saving and only for simplistic work in observing: - One "keyword" from GeBIZ for both "Open" and "Closed" Opportunities; - Extracting all details, documenting them in Excel-file in storage; and - Sending them to other personnel via email. This is only for immediate and lasting 6mths.
3.	Further maintenance and expanding on stage-1 functions/ development		S$1,500		Added Saving of time/$. If the solution-system has added functions, such as in dashboards and data analytics, it would further provide multitudes of insight-knowledge to groups-in-needs.
4.	2x person cost over another **6 month**	S$11,520		S$10,020	On assumption that "automated processes" is useful and expanding on its use to 2 persons/ departments, hence x2 savings

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6. Recommendations for future improvements

With time constraint, the team would make the following recommendations for future improvements:

1. Current implementation does not take into consideration on whether if it may or may not be necessary to login to GeBIZ or not, probably an improvement is to include this consideration and its aspects on invoking the login facilities be left when necessary, such as when required for downloading documents, submission of tender, etc. – further consideration on functions and user/s.

2. As of it is, the implementation/ application only takes inputs on keyword/s and has no intelligence whatsoever, future improvement could recognises areas of interest with individuals, departments, and/or managers; and direct email/ channel information to them, with controlled receivers of email of defined scope/s; and the building of the desired knowledgebase;

3. There may be need for timely ongoing scrap/s (probably weekly);

4. As accumulated details become available, a working dashboard/s could display necessary/ segmented information view by both the company and/or control individuals on scopes of projects for monitoring and tracking purposes;

5. Hence, incorporating and/or integrated to extended to data analytics and dashboarding of knowledge information system

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7. Reference

A. As per SCT 11 Project 1 Detailed Brief Apr 2022 Final (dated 27 Apr 2022), Slide-6

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(1) Team Website (WIX, Weebly)
(2) Project Report documenting the following
- How you applied what you learned in Training Phase
- Demonstration of Design Thinking
- Articulation of Challenge Statement: As-Is
- Your Solution and how it evolved across multiple iterations
- How much time/money/lives your Solution saves
- Challenges faced by team and how your team overcome it
- Recommendations for future improvements

</div>

(3) Presentation showing evolution of ideas
(4) Demo of the prototype workflow of the automation process (include a video as a backup).
(5) Weekly Report due every Wed noon to eric.chia@raceacademy.com.sg , comprises of:
- Submitted Date
- Team Members
- Project Objectives
- Project Plan and Status
- Gantt Chart
- Any other relevant materials

All Deliverables to be stored in dedicated repository (to be provided soon)

B. As per SCT 11 Project 1 Evaluation Matrix (dated 11 May 2022)

Evaluation Matrix
Deliverables
1. Quality of Report
2. Clarity of Demo Presentation
3. Readiness Level of Solution
Declarative Knowledge
4. How well does the team define and articulate the industry challenge?
Procedural Knowledge
5. How well does the team show sequences, procedural flows or circuit diagrams?
6. How much did the solution evolve from initial idea?
7. How well does the team apply Design Thinking techniques?
Conditional Knowledge
8. How well does the team apply technical knowledge learnt from Training Phase?
9. How much impact does the solution make in terms of time/money/lives?
10. How creative is the solution?
11. How well does the team overcome challenges?

C. Madagascar's Project-GeBIZ Report

D. GitHub Repository - https://github.com/alfredpyk/Project-GeBIZ

E. Git-Pages - https://alfredpyk.github.io/Project-GeBIZ/

F. Video-Demo
1. "Open Opportunities" - with keyword "tree" (3:37mins)
   a) Capture each Reference-index of all Open Opportunities into an Excel-file

b) On each items/ titles extract individually of necessary details
- Details as Agreed/ Requested
- As "Open Opportunities", Download ALL necessary documents for the tender (Download)
- Send email to specific (key in entry) user

<Reference Flashback - Open_Tree_Email_Jun 6, 2022 13_33_13.mp4, Captured using FlashbackExpress>

2. "Closed Opportunities" - with keyword "tree" (7:33mins)
a) Capture each Reference-index of all Closed Opportunities into an Excel-file
b) On each items/ titles extract individually of necessary details
- Details as Agreed/ Requested
- As "Closed Opportunities", extraction purpose of info on Respondents, Bidding Prices, Awards, etc. are crucial of each items/ titles

<Reference Flashback - Closed_Tree_NonEmail_Jun 6, 2022 13_45_02.mp4, Capture using FlashbackExpress>