



RACE-PBA-SCT-11 Team Madagascar

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 ThunderQuote or GeBIZ. Furthermore, the specifications of the tenders are often hidden in attached documents prepared by client organisations, 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)

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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)

Summary

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 and/or analysis are confidential 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.

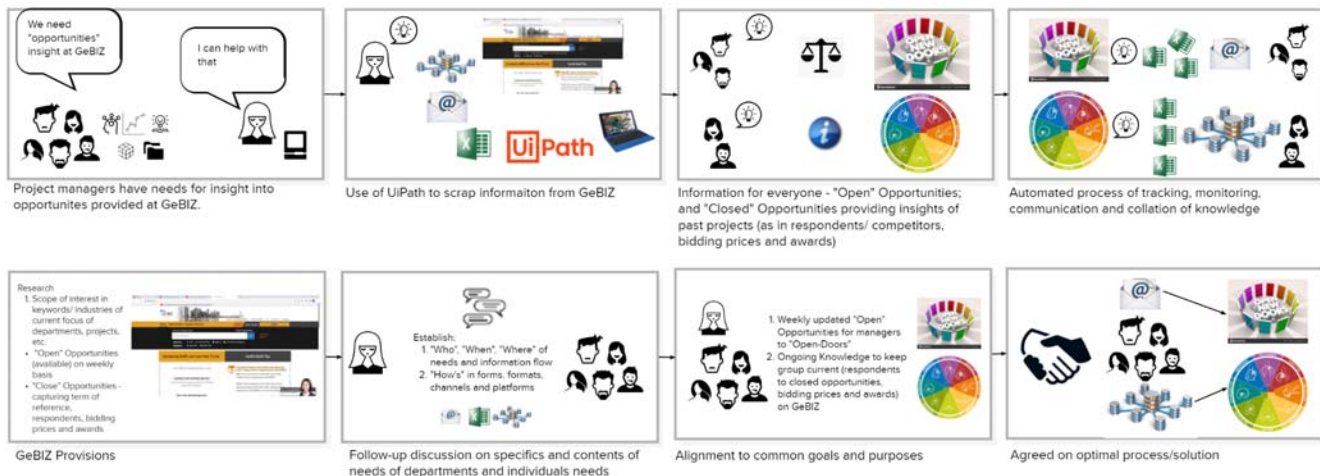
In order to full benefit from this site, a company requires a dedicated staff to search through relevant details and share/ communicate them with managers and designated personnel.

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:

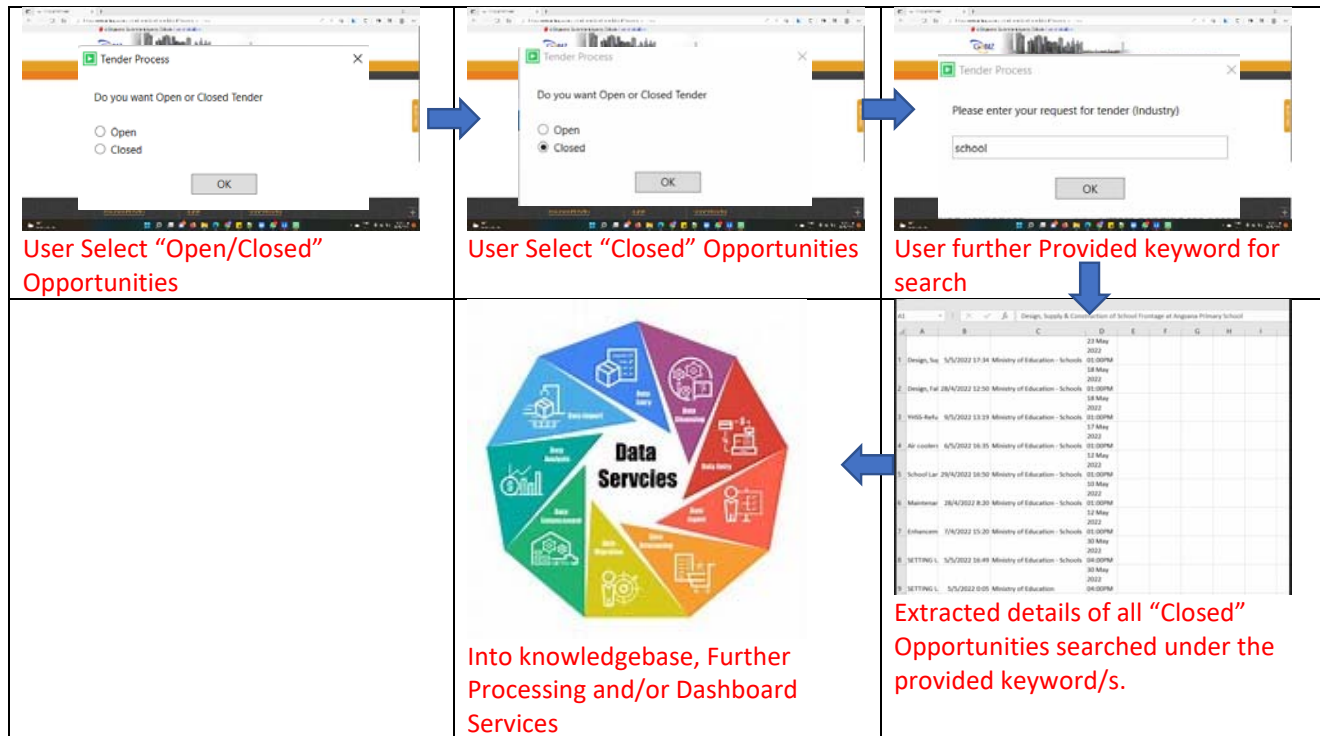
Raw ideas on the What's and How's Opportunities-Lead (on weekly basis) has a range of scopes (keywords-HDB, Green, Security, etc.) to search through:



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 Feedback:

Likes: Scope encompassing Open and Closed opportunities;	Criticisms: Unclear on system, if catering for single and/or multi-users?
Questions: Suggest on Information's provided for: <u>Open Projects?</u> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> - 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?

<ul style="list-style-type: none"> List of items to respond (Item Number + name of the item + Unit of measurement + required quantities + Delivery location + Delivery date) Remarks <p><u>Closed Projects?</u></p> <ul style="list-style-type: none"> 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 \$\$ 	
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e) Test

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


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.;
- 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

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)	N/A
MS Excel	2019	English	Thick	Desktop	
MS Outlook	2019	English	Thick	Desktop	Or may use direct SMTP

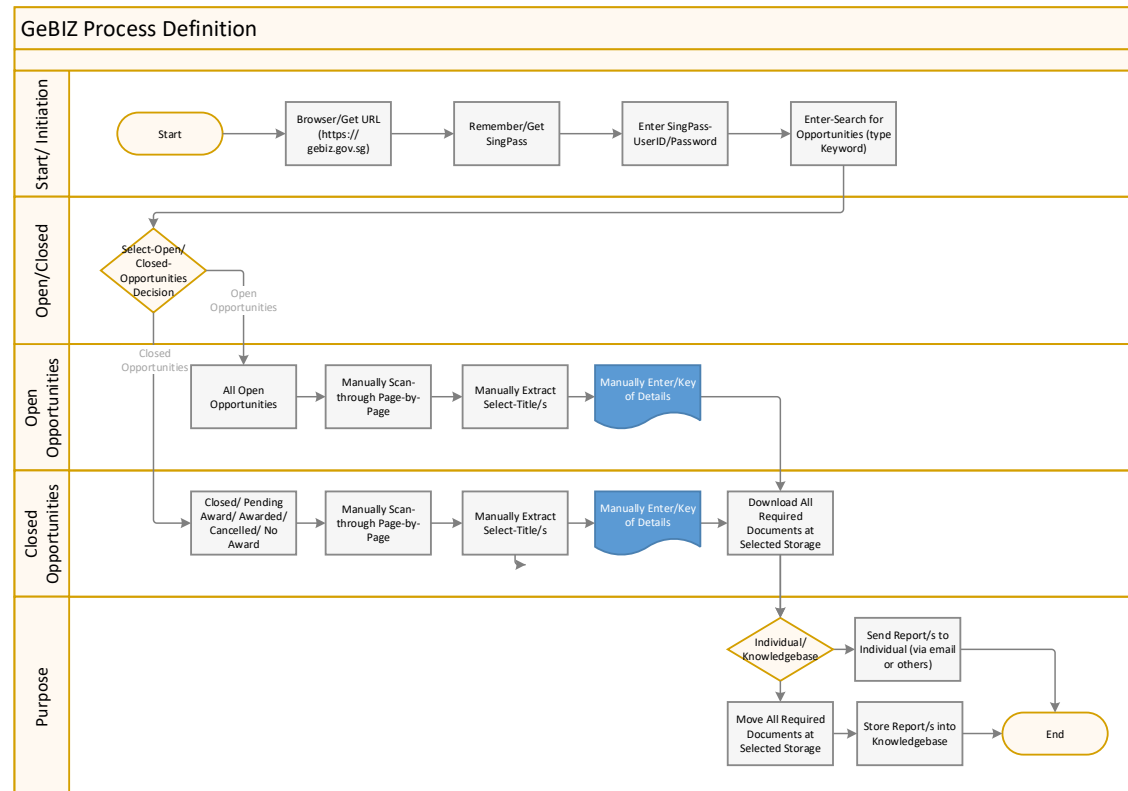
2. Articulation of Challenge Statement: As-Is

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:

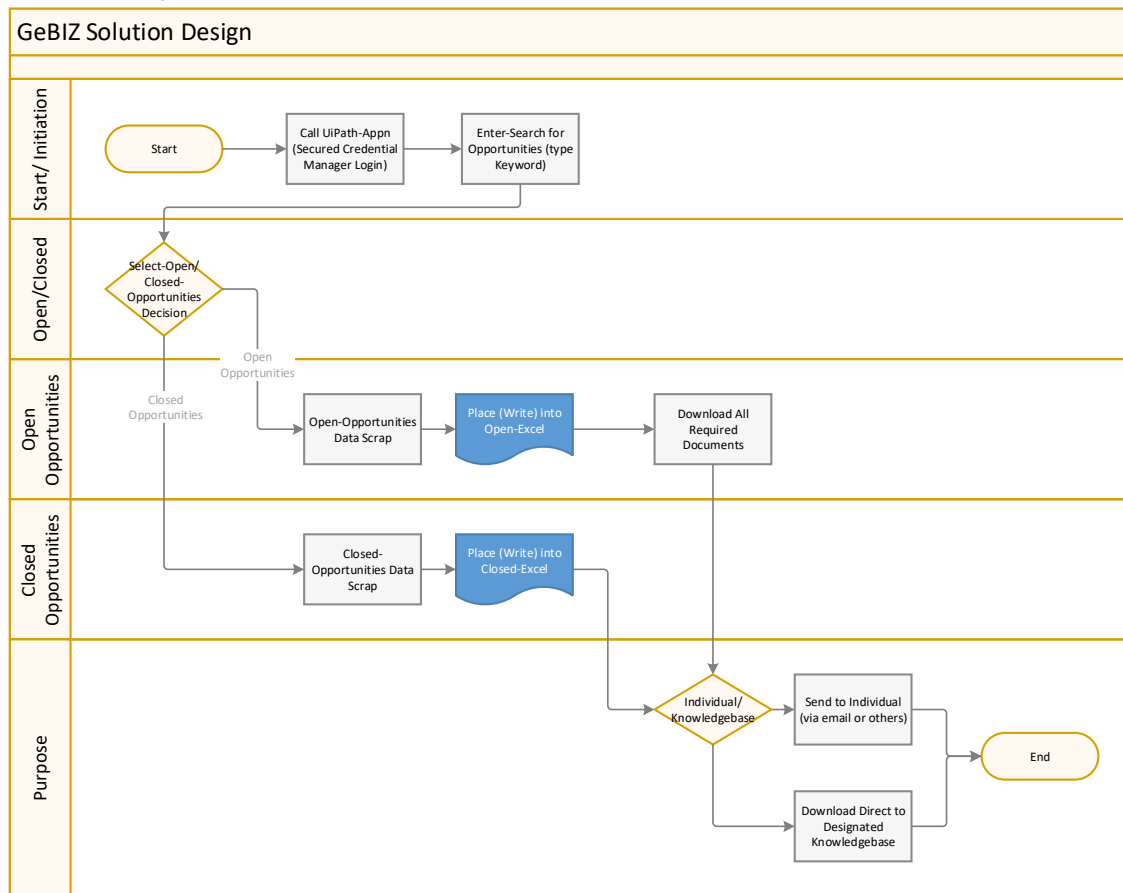
1. Available opportunities/ projects and
2. Be able to keep his/her “ear-on-the-ground” on competitors, bidding-prices and awards.”

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 evolution can be tracked through weekly updates in “Project Progression – Madagascar Report”, here are highlight of its evolution and iterations:

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; <ul style="list-style-type: none">- 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, bidding 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 – such as different categories (Closed/ Pending Award/ Awarded/ Cancelled/ No Award) in “Closed’ Opportunities, downloading of all required documents and email to managers.	Week-3	The Project-1 consists of 5 items: <ul style="list-style-type: none">a) Weekly Progress Reportb) UiPath Prototypec) “PROJECT 1 – GeBIZ (RPA-C-01 Tracking of Tenders)”d) Demo-Videoe) Blog/ Readme.md on GitHub
4.		Week-4	

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

There were several challenges faced by the team. It was obvious from day-one that the team is makeup of members with different levels of technical and literal capacities, and most of all willingness, agendas and aptitudes. Open-discussion and voting are excellent techniques in assisting the team in moving forward and progressing with the project.

a.

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

S/N	Item	\$	Remarks
1.	Cost of development	S\$1,500 - 2,000	Such typical projects/jobs, on average last about 5 days and costing between S\$1,500 - 2,000.
2.	Saving of time/\$	<p>If the solution-system is utilized by 2-5 persons (person-hour slaughtering through the gebiz.gov.sg), this will be multiply in accordance to each person x2-5;</p> <p>If the solution-system has added technologies in dashboards and data analytics, it will provide multitudes of insight-knowledge to groups-in-needs.</p>	The "time/ money" the solution saves could expand and multiply in accordance to functions and capabilities of the solution system.
3.			

6. Recommendations for future improvements

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

1. As it may not be necessary to login to GeBIZ, the login facilities may be left later when necessary, such as when required for downloading documents, submission of tender, etc.
2. The application may recognise areas of interest with departments, managers and/or individuals; and direct email/ channel information to them, that is controlled receivers of email with defined scopes; and building of the knowledgebase;
3. With ongoing scraping (probably weekly), a working dashboard/s displaying necessary/ segmented information view by both the company and/or control individuals on scopes of projects for monitoring and tracking purposes;
4. This project could be extended to data analytics and dashboarding of information scrapped;
- 5.

6. Reference

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

- (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
 - (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?