

QUIP School of Computing

Junior Business Analyst

XRM Business Applications Centre of Excellence

Global Affairs Canada

Under Team Lead Serge Lebrun

Internship Report

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Table of Contents

| | |
|--|----|
| Introduction | 1 |
| Internship Motives & Goals | 1 |
| Typical Day at Global Affair Canada..... | 2 |
| Projects | 4 |
| COE Case Accelerator..... | 4 |
| BRM & LDW..... | 5 |
| Routing Canvas App..... | 7 |
| COE Flexi Desk Reservations..... | 8 |
| Networking | 9 |
| Conclusion | 10 |
| Appendices | 11 |

Introduction

As a Computer Science – Specialization (Computing) student who has being strongly interested in the video game industry¹ and diverse social sciences and humanities subjects such as economics, politics, philosophy, history, and etc² since high school, I am aware in my first-year of University that I am more suitable for being in the workplace, where a diversity of skills and interests are valued, than for being in the laboratory, where a specific field of research is drilled down (depth of skills is more important than the breadth of skills). Therefore, I joined QUIP in my second-year (2018), hoping to secure an internship placement to understand how the professional workplace actually operates and to apply the knowledge and skills I acquired from either school or self-study in the real-world.

However, due to my inferior English communication ability and the disparities between my professional capabilities and the job requirements, I have been rejected by more than 6 companies after being video interviewed, which caused me to be disenchanted about getting a taste of the actual professional workplace before graduation. Then, as the pandemic hit the world in 2020, I took a relatively light course load in the 2020 - 2021 academic year to give myself some time to relieve my tense nerves and to reflect on what career path I really wanted to follow for the rest of my life. During my free time in this academic year, I started to draft my ‘life blueprint’ and realized that the data analytics and politics were in the area of my interests. Thus, I changed my resume submission strategy to primarily apply for the governmental IT and analysis positions, meanwhile, I continuously practiced my English speaking in attempts to ensure fluent communications in the possible upcoming video interviews. Fortunately, my hard works paid off. The final position I had applied in QUIP³ offered me an opportunity to enter the professional workplace, which was being a Junior Business Analyst at the XRM Business Applications Centre of Excellence in Global Affairs Canada.

Internship Motives & Goals

In addition to the aforementioned desire to be in the professional workplace before graduation, one of my main motives to take the internship at Global Affairs Canada (GAC) is that it offers me an experience that fits exactly to my draft ‘life blueprint’. Since I have a professional

¹ I have run a YouTube Channel posting derivative works about a video game called Genshin Impact at <https://www.youtube.com/channel/UCfxndOrAQr0rx7E0TeFtzXA>

² I have studied philosophy on my own during my leisure time by reading the philosophical works (written by Immanuel Kant, Jean-Jacques Rousseau, Albert Camus, etc) and watching educational videos about philosophy on either YouTube or Coursera

³ If I was rejected for this position, I would not be able to get an internship before my graduation as I was going into my final year at Queen’s

pursuit in the career of Business Data Analytics⁴ and have planned to obtain a Master of Management Analytics (MMA) degree at a Business Graduate School after graduating from Queen's as a Computer Science (Specialization) bachelor with a Data Analytics focus, I consider the 'Junior Business Analyst' job at GAC as a precious opportunity for me to begin to actualize my 'life blueprint' as the position will substantially enrich my skillset and expand my vision, improving both of my hard and soft skills largely to increase my competitiveness in both of the job market and the application to graduate schools.

Regarding to the goals I am expecting to achieve from my internship, in addition to acquiring enhancements to my technical or hard skills, I also want to strengthen my workplace skills such as knowing how to get along with my higher-ups and colleagues well, and understanding how to negotiate with others in a way that the others' thoughts can be guided by me (like persuading others to believe what I believe, which is a typical characteristic a seasoned business analyst or a practiced leader should possess). Moreover, I want to further refine my task and time management abilities through this practical work opportunity as I think that the task and time management skills I learned from University might fail if I apply them directly to the workplace. For example, in University, an adequate task and time management ability means being able to deliver satisfactory course works before the deadline, while in the workplace, it means being able to produce a Minimal Viable Product (MVP) before the demonstration date collectively as a team with as little as possible work overtime. Lastly, I hope that I can utilize this internship opportunity to establish my initial professional network with people who have penetration in the Business Data Analytics field, which could provide significant assistance to quicken the actualization process of my 'life blueprint', such as providing me with the internal referrals or the valued reference letters I needed to be successfully admitted into my desired graduate school immediately after graduating from Queen's.

Typical Day at Global Affair Canada

Since this internship position is conducted fully remotely online due to COVID-19, all the group communications and collaborations are carried out on-cloud, leading my typical day at work to be sitting in my room and facing the company-issued laptop from 9AM to 4.30PM without physical interactions with my colleagues or managers. Though such work experience is not what I expected when I joined QUIP, the remote working mode enables my transition from school to work to be more manageable and easier, because I can bypass some of the major obstacles of transitioning to a physical workplace such as commuting in a new city, familiarizing with the new work environment, and handling the potential office politics. Hence, as we are entering the Post-Pandemic Era, in which a

⁴ I believe that the market potentials for the Business Data Analytics jobs will be tremendous in the near future as the technology evolves

hybrid working model that combines remote working with onsite working is gaining considerable popularity and feasibility, I believe that the remote work experience I had at GAC will be long-term beneficial for my career path.

To be more detailed about my remote working experience, the team I am in uses Microsoft Teams to organize a virtual team meeting every work day from 9AM to decide and distribute the workload of the day for and to each of the team members, while the team members can also share their roadblocks during the meeting to gain attentions and assistances from the other team members who may be more suitable for the tasks. After the daily team meeting, the team members will use the Azure Devops Kanban board to visually display and track the progressions of the works assigned to them (such as showing the progressions of the user stories and bug tickets from the analyzing stage to the testing stage) in real time. If a team member encounters a problem⁵ that cannot be resolved independently during the work hours, he/she could request other members' help by sending a message in the Microsoft Teams chat, where he/she could normally receive a written response or video call assistance within 30 minutes after sending the help request message. In addition to work independently, the business analysts in the team (including me) also need to engage in 2 or 3 weekly virtual meetings with our clients to demonstrate the progresses we have achieved on their Dynamics solutions from the past week (for getting timely feedbacks from the clients) and to discuss any adjustment on the specifications of the solution is mandatory or recommended. Once those new client requirements are translated by me or other business analysts in the team into user stories or work items, we can present those new user specifications in the next Teams morning meeting and assign them to the appropriate team members.

With this highly efficient team collaboration, the productivity of our team is remarkable in the SIAZ⁶ branch, and I have been praised by my manager for being capable of finishing the works, which an indeterminate employee may take a half week to complete, within 1 day. Furthermore, the atmosphere of mutual support and light-heartedness created by my team members also enormously accelerates the process of comprehending my work contents / duties⁷ and of adapting my mentality to better fulfill the job requirement such as being constantly positive and eager to learn. Therefore, I conclude that the internship at GAC is an enjoyable and fruitful experience for me as I am able to acquire and enhance substantial technical and soft skills due to it, which I will illustrate more in depth in the remaining part of this report.

⁵ Either technical problems like needing help with debugging (usually requested by interns like me), or non-technical problems like needing to be granted access to an environment

⁶ SIAZ is just a code assigned to the branch our team is in with no actual meaning

⁷ For example, I grasped how to use Dynamics 365 to create and configure a solution within 2 weeks of my first month at GAC

Projects

All the following contents are non-confidential and have been proof read by my manager to ensure no sensitive information under the Non-Disclosure Agreement are contained in the report.

COE Case Accelerator

COE (Centre of Excellence) Case Accelerator is the first Dynamics 365 project I have worked at in GAC, and the client who initiated the project is actually my manager. This is because that my manager, Serge Lebrun, has realized that the clients our team has worked with in the past were requesting more similar than different functionalities, meaning that we can yield greater work efficiency, less time to production, and more cost savings by constructing a pre-configured solution with pre-populated GAC organizations & users data. In addition, by applying the COE Case Accelerator to each of the new instance of Dynamics⁸, we can standardize the entities, attributes, and fields across multiple Dynamics solutions we delivered to maintain a consistency, and generate more momentums for new projects due to less redundancy.

We approach this project by starting mapping a generic business process for our imaginary future clients in order to determine the fields, entities, workflows, business rules, business flows, etc, the solution should have. Then, I am given the task to create the data dictionary and scoping documents for the Case Accelerator solution, which will be used as references when generating specifications or user stories against the Case Accelerator solution and building the solution. Once the documentation works are completed, the developers in our team⁹ begin to build the solution collectively. I am involved in the majority of the development works for this project as I wrote the data dictionary and scoping documents. Additionally, since I have interests in the Data Analytics, I cooperate with a senior developer in our team to establish a Master Dataverse base that reserves the GAC organizations & users data. The advantage for establishing the Master Dataverse base is that it enables us to implement dataflows to automatically populate the GAC data to the solutions built based on the COE Case Accelerator, which avoids manually importing the GAC data into each of the solutions requested by the clients, and so boosting our work efficiency.

After the completion of the version 1.0.0.0 of COE Case Accelerator solution, we soon start to work on a major update of the solution as my manager is inspired by a client who wants to have a

⁸ A Dynamics solution is an instance of Dynamics, which is provided to each of our clients as a case or information management tool

⁹ I am also a developer in the team, though my work title is Junior Business Analyst

routing functionality in her solution. This is where I begin to grasp the Agile methodology in the constantly changing IT world, because I have to redo the aforementioned business process and the documentation works to integrate the new routing feature into the COE Case Accelerator. After the completion of the documentations works and the initial development works, I am tasked to write embedded custom JavaScript code to realize certain functional requirements on the Routing entity. For example, one of my user stories is to create a ribbon button that generates a Favorite Routing entity record based on the field values and relationships of the current Routing entity record and of all the Assignment entity records associated with the current Routing entity record. I work on the JavaScript codes diligently as they are embedded in the Dynamics environment (meaning that I have to be proficient in applying the Dynamics API), and I only seek for the senior developers' supports when I have been halted by an unknown issue or bug for more than 2 days as I want to be capable of completing the technical assignments independently. Thus, through hard working on this project, I am confident saying that I have dramatically improved my coding and API researching skills, as well as my task and time management skills and the mastery of the agile methodology.

BRM & LDW

This 2 projects, initiated by Business Relation Management (BRM) branch and LDW¹⁰ branch, are both straightforward without technically complicated specifications, and are both built based on the COE Case Accelerator solution, which leads us to be able to produce a Minimal Viable Product (MVP) for the 2 clients respectively within 15 days after the completion of the relevant documentation works. During the development period, my team regularly meets with our clients through Microsoft Teams to discuss about the designs and functionalities of their solutions, and to revise our current user stories and development directions accordingly to their feedbacks.

Since I am a developer and a business analyst in the team, I can sometimes talk about the clients' functional requirements on the solutions from both of a business perspective and a technical perspective, which enhances my communication skill to a level where I can guide the clients to propose their custom Dynamics solution designs in a way that fits the rules and the logics of Dynamics and minimizes the redundant works our team may need to do.

For example, when our team is discussing the Dynamics Solution design with LDW, we notice that they are proposing to apply excessive amount of business rules and workflows to 'automate' their Dynamics solution (such as auto-fill a field depending on certain previous field values, and use a custom button to create a case record from anywhere on the solution site) as they think such design is user-friendly and will increase their work efficiency considerably. However, from

¹⁰ LDW is a code assigned to the communication branch of GAC with no actual meaning

a technical perspective, though Dynamics is highly customizable, some of the specifications LDW is requesting are not aligned with the planned usage of Dynamics, meaning that we have to write tremendous amount of customized JavaScript code to realize those specifications. This is a risky operation as we do not use the Out-Of-The-Box (OOTB) functionalities Dynamics provides, which increases the likelihood of encountering uncanny bugs in the production environment later. Besides, from a business perspective, as the specifications can be modified and escalated significantly as LDW's business requirements are being iteratively optimized, sizeable amount of automations at the early phase of the project (before a MVP is produced) can create difficulties for the maintenance of the codes as more requirements and functionalities are added in later, which unnecessarily increases our development time and consequently the LDW's project budget as the project quoted price is calculated based on the time our team dedicated to the project.

Therefore, to lead the LDW to share the same vision with us, I initiate a conversation during a virtual LDW client meeting by saying that their suggestions on the modifications of the solution were extraordinary (let the clients firstly know that we appreciate the insights and ideas they provide), and we will record their proposals in our data dictionary (let the clients think that we have accepted their ideas). However, in the next breath, I tell them that some of the automations they are proposing are not using the OOTB functionalities of Dynamics, with which there are risks associated (implying that the implementations of some of the automations they proposed are dangerous and discouraged), so we have to decline to implement those automations. Then, I suggest that we will complete the rest of the proposed automations at the final phase of the project for the ease of the solution maintenance¹¹, which minimizes the redundant or 'throw-away' works our team may need to do, and so better control LDW's project budget. Through persuading with sound logics and a low profile, LDW is unconsciously guided by me during the conversation, and is pleased to accept my scheme about their solution design at the end of the conversation.

Unfortunately, both of the LDW and BRM solutions are not deployed to the production environment at the time I am finishing my internship owing to the time-consuming security procedures and the constantly changing priorities and requirements in the government institution, meaning that there is a possibility that the 2 solutions will not be utilized by our clients eventually. From this experience, I learn not only the truth that one's technical ability in the real industry environment is not as emphasized as a decisive property as in the academic environment¹², but also

¹¹ From experience, it often turns out to be that the clients would forget what they have proposed at the start since their specifications are updated frequently

¹² Even one could satisfy all the technical requirements the clients asked for, the solution may still not be used by the clients eventually

how to cope with the scenario where my endeavors on a project may not be appreciated and create any practical value.

Routing Canvas App

This is a Canvas App front-end of the routing functionality with the COE Case Accelerator being the Dynamics back-end. Since we are aware that the Dynamics interface is not sufficiently compact and intuitive for the clients who will exclusively use the routing functionality through collecting feedbacks from the demonstrations of the routing functionality, we start to exploit a way to provide a smoother, more simplified, and more appealing user experience of absorbing the routing information without compulsorily accessing to the Dynamics web page. This is the reason why the front-end application project is initiated.

After several team meetings discussing about the design and the functional specifications of the routing application, the user stories are generated correspondingly and distributed to the developers in the team. During the development period of the routing application, as my manager is cognizant of my passions in Data Analytics, in addition to the Canvas App functional coding, I am also assigned to the task of visualizing the routing data, which is building a user dashboard (splash page) and a workload management dashboard. The instructions and specifications given to the layout and the content of the dashboards are very vague¹³, allowing me to have high autonomy and flexibility in designing and constructing the dashboards. Through massive researches online and consulting with the senior developers in the team, I have successfully constructed the 2 dashboards and iteratively optimized them over time to an extent where the user can gain maximal needed insights of the routing data with minimal clicks and navigations between screens¹⁴.

Through this application development experience, which exposes me to the full life cycle of software development, I have understood the elaborate process of how a real software application project is identified, formulated, evolved, and completed professionally in the industry.

¹³ My manager simply asks me to come up with my own user stories of the dashboards by considering what I want to see on the dashboards if I am the client

¹⁴ Refer to Figure 4 in Appendices for a picture of the user dashboard (splash page) of the routing front-end app created by me

COE Flexi Desk Reservations

This is a workspace booking application for the GAC users that has a Canvas App front-end with a Dynamics model-driven app backend. The COE Flexi Desk solution is developed based on the booking application from Transport Canada and is configured to create workspace reservations in the GAC buildings. This project is initiated by the Chief Information Officer¹⁵ (CIO) of GAC to support the transition from the COVID remote working model to the back-to-work hybrid model as the GAC employees need an effective way to identify all buildings, floors, zones, and workspaces available at the day they will come to work onsite, and to book the apt workspaces that fulfill their office demands¹⁶.

Through a few virtual meetings with a IT team from Transport Canada who has built a similar booking application before, and a series of internal team meetings discussing about the functional specifications of the front-end and the back-end of the Flexi Desk Reservation solution, we have formulated the front-end Canvas app architecture and the structure of the Dynamics back-end. For example, the Flexi Desk back-end will be developed to contain a data hierarchy for embodying the geographical features of the workspaces like the buildings, floors, and zones the workspaces are in. In the meantime, the back-end will also incorporate an aggregated list of the workspaces, which includes the visual illustrations of the workspace locations on the floor maps, the PNG images of the workspaces, and the information about what are available in the workspaces. Then, by connecting the Dynamics data to the front-end app through Dataverse, the front-end app can display the workspace details in the read-only mode based on the location and the reservation time period the user selected in a user-intuitive and visually appealing way. Once a workspace reservation is created successfully by a front-end user, the reservation record will be saved and tracked in the Dynamics back-end for the management and security team to view.

One challenge of the Flexi Desk project is that we need to develop the Canvas App front-end in a way that its performance, user interaction, and composition are satisfactory on various mobile devices, and so through working on this project, I have learned numerous concepts and techniques regarding developing a mobile application¹⁷. Furthermore, as my enthusiasm on the data visualization remains undimmed, I am given the task to create 2 reservation workload dashboards for the analysis of the workspace availability and popularity. One dashboard is built through the Dynamics dashboard configuration, and the other one is built through Microsoft Power BI that has been enabled to be integrated into the Dynamics environment by me and a senior developer in the team collaboratively. I

¹⁵ This position is in charge of the information management and the information technology across GAC

¹⁶ For example, the employees may require the workspace to have 3 monitors, to be in the collaboration area, or to have the relevant development software installed in the desktop of the workspace

¹⁷ Refer to Figure 5 in Appendices for a picture of the Flexi Desk front-end app in play mode

mainly focus my efforts on the construction of the Power BI dashboard as Power BI is a highly configurable and complicated data visualization software, while I need to study how to manipulate it independently from scratch as few developers in our team are conversant with it. Through intensive trials and errors, researches online, and occasional consultations with the people who are skillful on Power BI outside of the SIAZ branch, I ultimately manage to establish a prototype of the Power BI dashboard. However, as my internship term is about to end unfortunately, I have to leave this dashboard non-optimized, and I have created some user stories and documentations recording my design and thinking about all the works I am unable to finish, which should assist the next interns who will start on this September to continue on my incomplete works smoothly.

Networking

On top of honing both of my hard and soft skillsets through working at GAC, I also attempt to leverage this internship opportunity to network with people who have penetrations in the Business Data Analytics field as I have planned to pursue a Master of Management Analytics (MMA) degree after graduating from Queen's.

Since my manager has a wide range of contacts in GAC due to his 20 years working experience at the government institution, I have arranged a meeting with him to discuss about my future career planning, craving potential connections with talents who have professional experience or background on either of the Business Data Analytics field or the Data Science field. Fortunately, my manager is interested in my planning and is gladly willing to help me with the networking. As a result, he has scheduled a virtual meeting for me with a PhD data analysis team leader in IM (the data department of GAC), in which I learned plenty of useful knowledge about the data science industry and its trend¹⁸. The meeting with the PhD team leader proceeds naturally and joyfully, and both of me and my manager have organized more of this kind of networking meeting afterwards, because I wish to absorb as much knowledge that might be valuable for both of my life and career through this internship opportunity as possible, while my manager needs a valid reason to reunite with his old coworkers and friends.

Furthermore, since those connections are leaders or managers in their respective teams or branches, knowing them firstly through arranged meetings and chatting with them afterwards to keep in touch with should expand my list of potential future employers, while my manager is also willing to write a recommendation letter for me if those potential employers request. Moreover, I sometimes

¹⁸ Such as knowing that a PhD degree is not a necessary condition for securing a senior business data analysis position in the industry, and understanding what are the underlying values of acquiring an Azure Data Scientist Associate Certification from Microsoft.

will proactively initiate conversations with the GAC employees I met in the virtual trainings¹⁹ I received. For instance, I will virtually reach out to them to discuss about how to use Azure Devops to automate the process of backing up the custom Dynamics solutions, and how to get the approval of this automation from the security group. Thus, through extensive networking with the GAC employees, I might be able to further expand my list of potential employers or potential coworkers.

Conclusion

In summary, I have acquired what I expected to gain at the start of my internship, such as expanding and enhancing my technical skillset, strengthening my workplace skills like negotiation techniques, and establishing my initial professional network. Over the course of my internship, I have tried my utmost to iteratively become more resourceful on facing technical problems and more professional on processing non-technical affairs such as ensuring a joyful 'integrated customer experience' for my clients.

Furthermore, I have been delighted to be part of the supportive and cohesive SIAZ team, and been brought to the enlightening new experience such as adopting the synchronized cloud collaboration methodology and technology to execute and organize IT team projects in an efficient and structural way. I really appreciate this internship opportunity as it is a pleasurable and eye-opening experience for me, while I believe that the work mentality and the expertises I developed through the internship will serve me to set the world on fire later in my life.

Finally, as this internship experience has 'embellished' my resume, I have reinforced my determination of pursuing a MMA degree and a career of business data analyst according to my draft 'life blueprint'.

¹⁹ GAC offers free online technical trainings from Microsoft for its employees, including the interns like me

Appendices

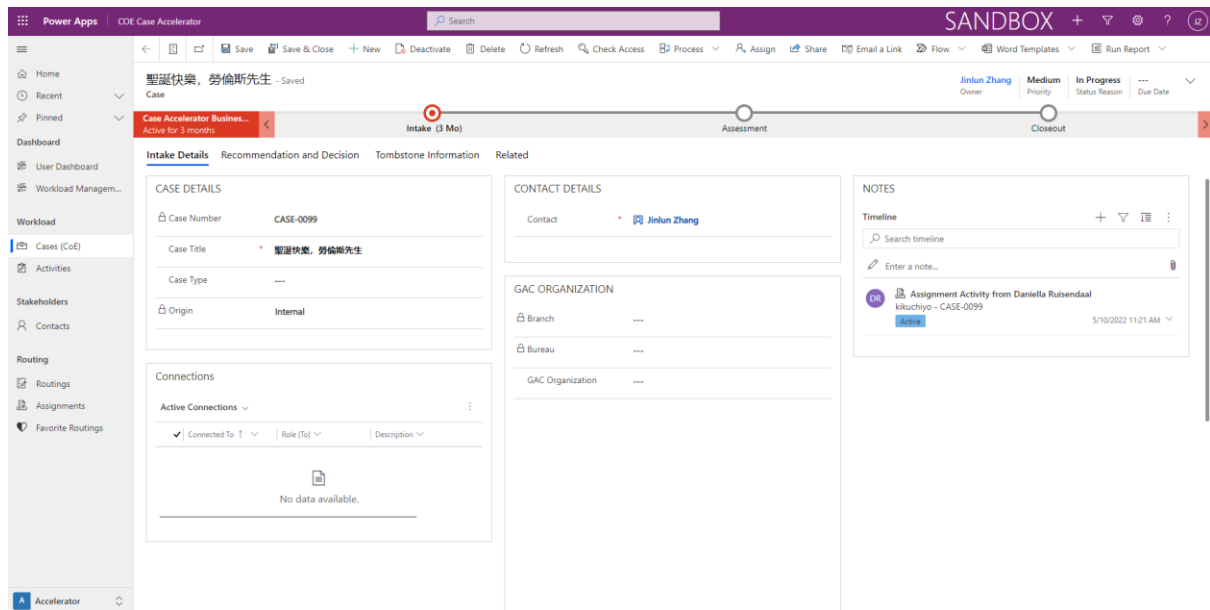


Figure 1: A screenshot of a test case in the COE Case Accelerator Solution

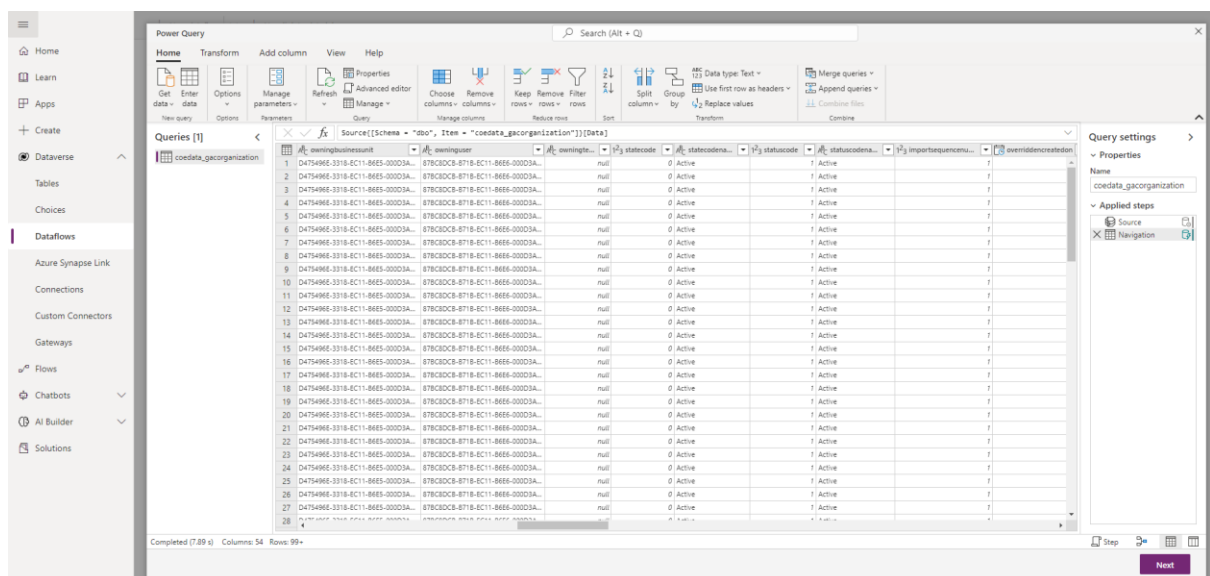


Figure 2: A screenshot of the Master Dataverse base that stores the GAC data

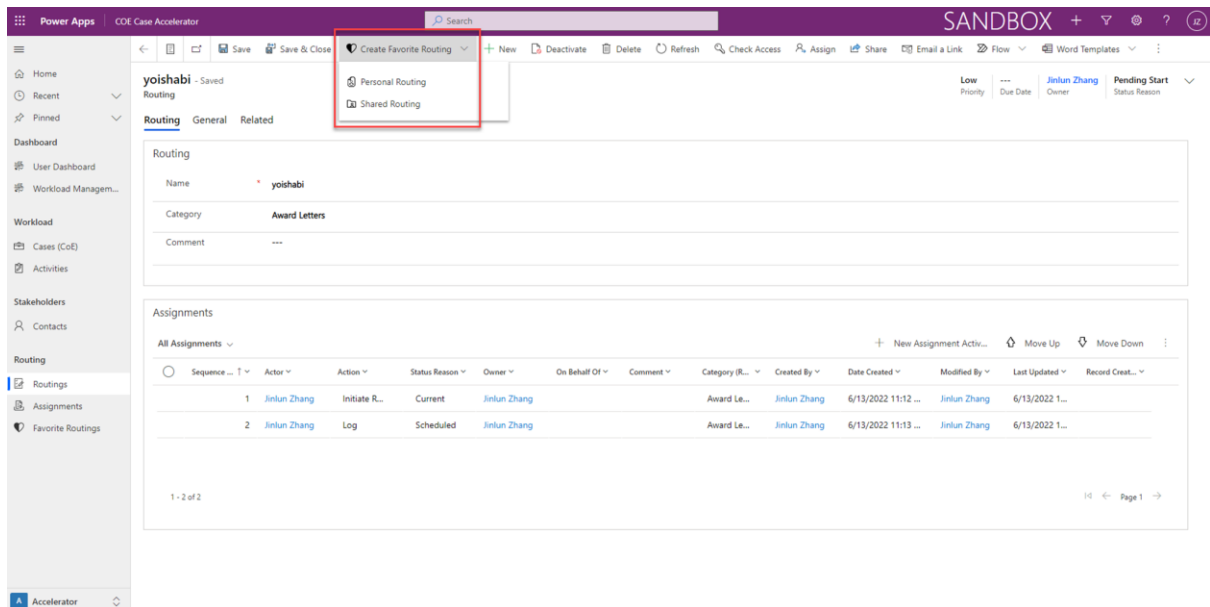


Figure 3: A screenshot of a test Routing entity record (The custom ribbon button I programmed is highlighted in the red rectangular)

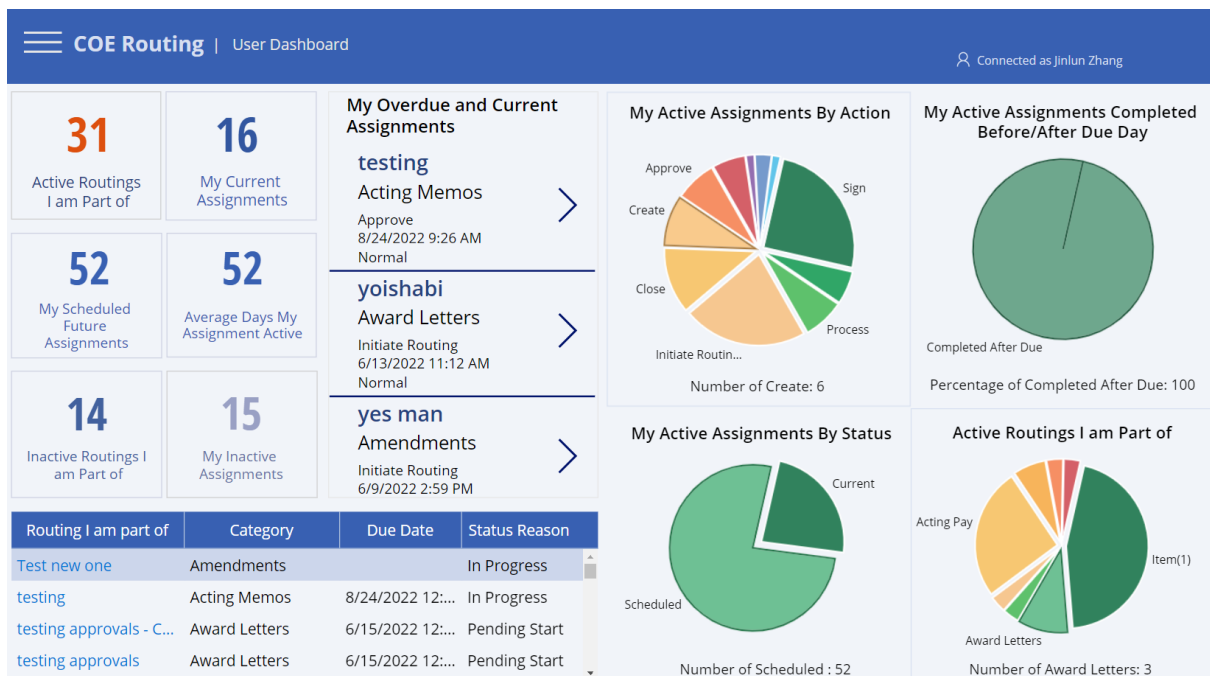


Figure 4: A screenshot of the user dashboard (splash page) of the routing front-end app created by me

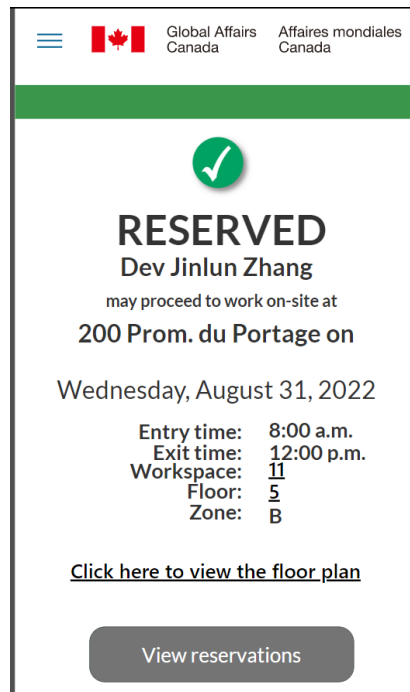


Figure 5: A screenshot of the reservation success confirmation page of the Flexi Desk front-end app in play mode

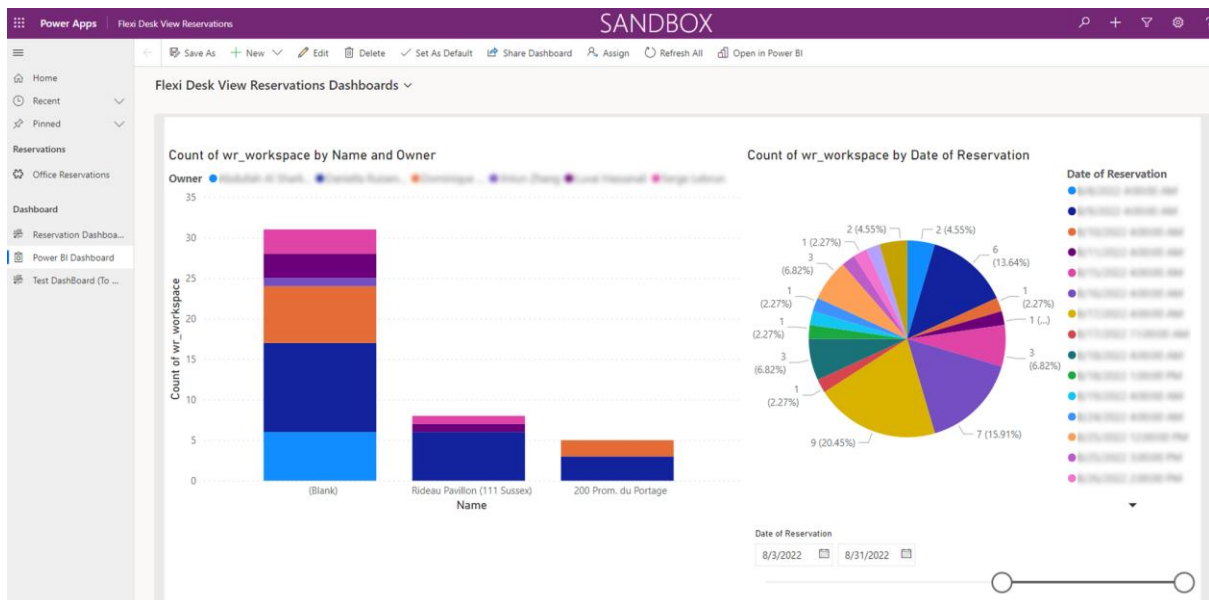


Figure 6: A screenshot of a section of the Power BI dashboard integrated into Dynamics and built by me (Sensitive Information are blurred)