



Working as Technical Support Engineer

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Abstract

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<p>This thesis presents a comprehensive account of a Technical Support Engineer's journey, documenting challenges, opportunities, and growth in the span of eight weeks, from 23rd January to 17th March 2023. Through reflective diary entries, the author captures their daily and weekly progress, highlighting the skills they acquired, and the obstacles they overcame. The thesis also includes a detailed analysis of concepts, theories, and issues related to the author's work in the Microsoft ecosystem.</p> <p>With a focus on personal and professional development, the author sets clear objectives at the beginning of the thesis, outlining their aspirations for deepening their knowledge of Microsoft products and the native tools and products used in their company, By the end of the eight-week period, the author successfully achieves their predetermined goals, showcasing the effectiveness of their approach to self-improvement.</p> <p>The thesis is divided into four parts, each section offering unique insights into the author's journey. The introduction provides a broad overview of the thesis, outlining the purpose, scope, and goals of the thesis. Description of initial situations provides insight into the author's situation before starting the diary entries, which provides information on Stakeholders, the author's current situation at work, and an analysis of current work. The heart of the thesis is the diary section, which comprises detailed daily and weekly analyses, of what the author learned during the day and the week. Through this section, readers gain an understanding of the author's work and the challenges they faced. Finally, the Discussion section provides a critical analysis of the author's experiences and insights gained during the eight-week period. The section ties together the author's observations and learning, offering a detailed analysis of their progress and highlighting areas of future development.</p> <p>Overall, this thesis serves as a valuable resource for anyone seeking to track their growth, learn from their experiences, and set achievable goals for their personal and professional development. It highlights the importance of reflection, planning, and consistent effort in driving one's growth and success.</p>
Keywords Technical support, Microsoft ecosystem, SharePoint, Azure.

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1 Introduction

For the thesis, the diary entries will start on the 23rd of January 2023 and will last, for 8 weeks. The last day for the diary entry will be 17th March 2023.

This thesis is based on my experience of working as a Technical Support Engineer in a German-based SaaS company, which is focused on providing world-class internal communications platforms to companies of different sizes ranging from medium-sized companies to enterprise companies. The company was founded in Germany and now sells solutions all over the world with multiple offices across the world. Currently, the company provides the product to over 2000 leading enterprises. The customers are from different industries, like logistics companies, IT companies, retail companies, and so on. The vision of the company is to be the leading provider of internal communications solutions to customers. The company provides different types of solutions to provide an overall internal communication platform to customers.

The company's products are employee email, employee App, Front Door Intranet, SharePoint, and Teams. The customers can choose to buy what they need, and this also provides solutions for customers who are heavily invested in the Microsoft ecosystem. Currently, my job involves working with a product built on Microsoft technology, this involves me working with 3 products. Product 1 is an Intranet front door built on SharePoint, and Product 2 is based on teams, which is a governance product. This product allows users to create Microsoft Teams groups with different governance and rules and customize the groups as needed. Product 3 is also based on Teams, which allows users to access SharePoint in Microsoft Teams, so users can easily access news and other related information on their mobile devices.

The goal of the company is to be able to help customers to reach their employees effectively and efficiently. This will in turn help them improve customer productivity, keep employees connected, build better company culture, improve employee engagement, and transform the way the customers work. The products also help customers reach their frontline workers easily and bridge the gap that frontline workers have with the company or management.

I started in the company as an Intern in the January of 2022 for 6 months, where I learned about the product and the job itself. After an internship of 6 months, I joined the company permanently. Currently, my role is Technical Support Engineer. I belong to a team, which is mostly focused on providing support for our Microsoft-based product, which is built on top of SharePoint and Teams. So, my job mostly involves working with the Microsoft ecosystem, with

technologies like O365, Azure, SharePoint, Teams, PowerShell, and PowerBI. My job as a technical support engineer is to provide help and support to our partners who are the main point of contact for our customers. Our product is sold by partners all over the world, first and second level of support is provided by our customers who are professionals in Microsoft products. When they need additional help or support, they create a ticket through the ticketing system Zendesk, then agents like me get the ticket, which we try to solve the issues.

There are different modes we need to use to solve the issues, we can use the ticketing system itself to solve the issues, and sometimes we need to get on a call to help partners navigate through the problems to solve the issue.

The skills I need for my job are an excellent understanding of our product, the ability to dive deep into the problem to understand the problem and what could be the reason for such problems and if there could be a solution to the problem or any other alternative way to deal with the problem. We need to understand network calls, different levels of permissions in the Microsoft environment, authentication issues, understanding Azure and how it works, and generally keep up with Microsoft changes and how the changes can affect our product in return. We need to have problem-solving skills, analytical skills, and excellent communication skills as well. We need to understand the kind of the ticket and understand the end customer and their environment so that we can make understanding the problem a little easier.

I am at an associate level now; I want to develop my skills to be a technical support engineer. I want to improve my skills and learn more about solutions, improve my ability to debug problems, and improve my skills in understanding different aspects of products. I want to build my confidence so that I can communicate with partners and improve my ability to debug complex problems and improve my communication skills so that I can communicate the solution in simple terms that the partners understand.

SaaS

SaaS also known as software as a service is a software distribution model where a cloud provider hosts applications and makes them available for end users over the internet. (Chai 2022)

Fetch API

Fetch API provides an interface for fetching resources (MDN 2022).

Network activities	We monitor network activities to make sure that resources are being downloaded and uploaded as expected. In Chrome, we can do so by opening Developer tools and clicking on the Network tab.
MS ecosystem	MS ecosystem is a cloud-based business applications platform combining essential productivity and communication. For example, products like Teams, SharePoint, OneDrive, etc are part of the ecosystem. (Technical Drive 2022)
Azure	Azure is Microsoft's public cloud platform, where a collection of services is available, including PaaS, IaaS, database, etc. (Microsoft 2023a).
Debug	Debugging is running code step by step to find out a bug or something wrong with the code.
SharePoint	SharePoint is part of the MS ecosystem, which organizations use to create websites, and store, organize, share, and access information from any device (Microsoft 2022c).
Teams	MS Teams is the ultimate messaging app for organizations, a workspace for real-time collaboration and communication, meetings, etc. (Microsoft 2022b).
HTML	HTML is a standard markup language for webpages. (W3schools 2022).
CSS	CSS is the language used to style an HTML document (W3schools 2023).
Authentication	This helps to provide an access control system by checking if a user's credential matches the credentials in the documentation.
Handlebar templates	Templating language like Handlebars utilizes an input object and a template to produce HTML. They look like regular text with handlebars expressions (Katz 2021).
Crawled properties	These are the resulting property after the indexer crawls the contents of the SharePoint site (Clark 2022).
Managed properties	Search index consists of important contents and metadata, which are called Managed properties. To make the search easier we map crawled properties to managed properties (Microsoft 2022f).

Cmdlet	A cmdlet is a command that is used in the Windows PowerShell environment (Bigelow 2023).
Azure AAD	Azure Active Directory. Azure Active Directory is Microsoft's identity management service, and it is cloud-based.
Azure Service Accounts	Accounts used to represent applications or APIs are called service accounts. They are used so that human presence is not needed. (Microsoft 2022e).
Shared Access Signature	SAS token can be used to control how an individual accesses data in Azure.
Azure Storage	Azure Storage is a cloud platform provided by Microsoft to solve modern data issues scenarios (Microsoft 2023c).

2 Description of the initial situation

This section describes the initial situation of my current work, stakeholders, and interaction at the workplace.

2.1 Analysis of current work

My specific tasks differ on a day-to-day basis. Every day is a different day, as the number of tickets and the complexity of problems can vary. Some days the problems can be simple, as simple as just pointing partners to the right track, linking the right documentation, or informing them about the progress of previous bugs, or feature requests. Some days can be very complicated as the ticket raised might not provide enough information for us to understand the problem, in such cases, we ask for more information and sometimes even videos are needed to understand a problem. Then we need to replicate the issue as it helps us understand where the issue is coming from, and we can guide partners to the right solution. Some problems can be isolated issues in one tenant, and they may not affect other users, so we need to understand what could be causing the issue in this tenant, we need to debug the issue, and sometimes this needs to be done via screen share. So, the tasks can vary, but in general, we provide 3rd and 4th levels of technical support to partners.

The main skill I need to cope with the job is knowledge of the MS ecosystem, as the product I am working with is heavily built upon SharePoint and Teams, there are a lot of dependencies on the MS ecosystem. So, knowledge of how licensing works, authentication, O365, PowerShell, Power Bi, SharePoint, and Teams is very important to be able to cope with the job. On top of that, we need to keep track of changes within the MS ecosystem as well as some dependencies that can be affected due to changes by Microsoft. Apart from technical skills, skills like analytical skills, problem-solving skills, and communication skills are very important for the job. The skills to debug issues are crucial as well, to understand what the cause of the issues could be, and how we can overcome the issues.

The necessary knowledge was initially acquired from Haaga-Helia, as I learned different technical skills like Cloud, HTML, CSS, and JavaScript. I learned about Microsoft products like SharePoint and Teams, and Azure from Haaga-Helia, but that knowledge was at the surface level. When I got the internship, I started learning about the products in greater detail and I am still learning new things to this day from work. I am also getting to learn more about SaaS products.

The stage I am at now is a semi-skilled level, and there is still a lot of room to develop and grow personally. I need to start taking on more responsibilities and start looking at bigger and more complex problems at work, as the efficient way of learning is by doing. I might need help from different team members like other Technical Support Engineers and developers to grow and improve myself. I need to learn more about Microsoft technology like PowerShell, which is a useful tool in my job. Learning PowerShell can help me with a lot of automation and recognize different problems efficiently. This is one area where I can improve. Similarly, there are different functions in Azure, and learning more about Azure will be significantly helpful for me to debug and analyze issues. Similarly, there are dependencies with other MS technology so overall knowing these products, in brief, will help me improve in my job. So, this is my focus for now.

Currently, at my level, I do need help from team members or the development team as some issues cannot be solved without input from team members or developers. For example, in case of a bug, I do not have the authority to fix the issue and some complex issues need to be debugged by developers as they have better access to the code base and authority to make changes. There sometimes can be cases, which has been solved already in the past so, in that case, consulting with team members will help us with time, so consulting with team members from time to time is the best option.

The framework used daily:

– Local software: Product 1, Product 2, Product 3.

The products will be mentioned as Product 1, which is based on SharePoint and is used to enhance internal communication for employers, product 2, which is a governance product that adds different governance rules and regulations to Microsoft Teams while creating Teams and Groups, and Product 3, which is used to render SharePoint pages in Microsoft Teams.

– Tools and services: Slack, Teams, Confluence, Zendesk, and Jira.

– Technologies and framework: Microsoft ecosystem, SharePoint, Azure, Teams, JavaScript, and ReactJS.

–Microsoft Documentation: Microsoft has an extensive collection of documentation regarding the products, so Microsoft documentation is primary source information and the guidelines are used from the documentation.

2.2 Stakeholders

There are different stakeholders at my work. Product managers, developers, customers, test engineers, partners, and end-users are the stakeholders in my work. Product managers are the ones who decide on changes in the product, like fixing bugs based on their priorities, making changes to the product like adding new features, removing unnecessary features, and generally making products better. Developers are the ones, who develop the product, fix the bugs, and make sure the product is working as it should. Then we have test engineers, who are looking for bugs and they communicate the bugs to the development teams and the bugs are fixed. Partners are the companies who sell our products. They do all the installation in the customers' environment, take care of first and second-level support, and do the consulting work as needed by customers. Customers are the companies who implement our products to enhance their internal communication, so they can communicate efficiently with their employees. End-users are the employees of the companies who implement our product, and they are the ones using our product daily.

As you can see from Figure 1, there are a lot of stakeholders involved in our product and our work. The most crucial stakeholders that can affect our day-to-day job are developers and partners. As we are involved in helping partners, they are the ones we deal with daily, so we need to have constant communication with them. Some problems can be complex, so we need help from developers to solve the issues, so they are other important stakeholders in our job.

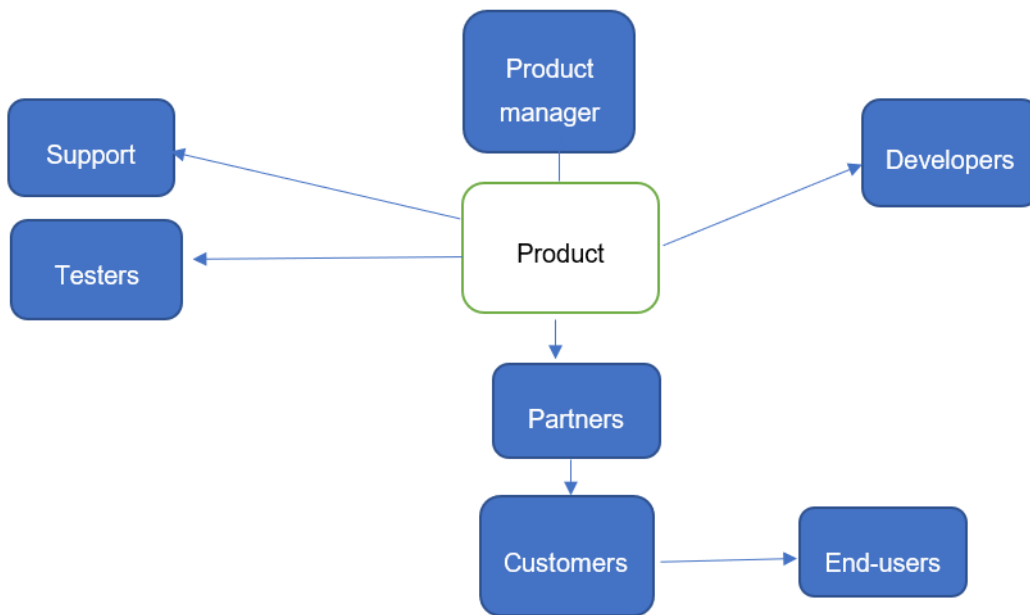


Figure 1. Stakeholders involved in my job

2.3 Interaction Situations

With team members we communicate daily, we use Slack for internal communications but for video purposes we use Teams. We have a team meeting every Monday with our team, where we discuss the past week what we did and what kind of issues/ tickets we had, we discuss our difficulties and what plan we have for the current week. Then we have another meeting on Tuesday where we have a developer of the week join us, and we discuss difficult tickets that we need help with. We continue with this communication as needed with the developers.

Then we have communication with partners, who reach us mostly via the ticketing system and sometimes via email. Then when needed we have a screen share session via Teams, this communication depends on the ticket and the willingness of partners to have a screen share session. We usually discuss a suitable time for a meeting based on the availability of both partners and agents. We do not have any communication with end-users as supporting end-users is the responsibility of partners.

Interacting with partners can sometimes be difficult due to language barriers and technical knowledge. Most partners are experts who have been working with our products and are involved in the Microsoft ecosystem for a long time. For some partners, our product is new so their

understanding of our product is limited it can take some time for them to get used to it, in such cases, it might be a little bit more complicated for us to deliver the message or help them. Overall, understanding partners and their level of expertise will be significant in improving my communication as I will be able to understand what kind or level of help the partner is expecting from me. Also, understanding different MS terminology, dependencies, and other products will allow me to improve my interaction skills as I will be more confident on the topic and the knowledge or help, I provide, and I will be able to communicate this to the partner effectively and efficiently.

3 Diary entries

This section will highlight my work on a day-to-day basis, what I have done, and what has been challenging. The main goals that I have during these observation weeks are being independent as much as possible, improving communication skills, solving complex issues, and learning about products and dependencies. At the same time, apart from improving skills related to tools and technology that I use at work, I also aim to improve my HTML, CSS, and JavaScript skills so that I can help partners better with customization tasks.

3.1 Observation Week 1

The theme I have set for this week is to improve my communication skills so that I can deliver the correct messages to partners smoothly and efficiently. Depending on the expertise level of the partner it sometimes can be difficult to deliver the message, so I want to improve this skill to boost my confidence and send the correct message that is why this week, I will be focusing more on on-screen sharing sessions with partners.

Monday, 23rd January 2023

The goal I have set for the week is to work on my pending tickets, focus and learn more about SharePoint analytics. Monday started normally as any other day. I started my day by following up on tickets from the past week. There had been tickets related to SharePoint analytics, which allowed me to learn more about how analytics work in SharePoint. I dived deep into the materials provided by Microsoft to understand how it works (Microsoft 2022a). Another complex issue for the day was an ongoing issue with audience targeting. This feature allows admins to target the audience for the content they create based on different properties like the location of employees, their departments, and so on. This is native SharePoint property. And in this issue, there had been some inconsistencies in the customer environment as audience targeting was not working as it should, so we did some debugging with the help of the .har file and values that are stored in session storage, I am still working on the issue as I am waiting for additional information from the partner.

Tuesday 24th January 2023

To improve my confidence in collaborating with partners to investigate issues, I set up a few calls with partners to investigate existing issues. This helps me with my communication and debugging skills while improving my confidence level. I had an existing ticket, where the news creation date was not being accepted by the product after trying to replicate the issue for a long time, we tried changing the locale settings of the customer, and this helped with resolving the issue. Sometimes,

the problem can be solved with simple changes in the environment, in this case, it was similar. After trying for quite a while, we solved the issue with this simple solution. This was an interesting day, I had several other tickets and calls with partners, and I was happy with the outcome of the day.

Wednesday 25th January 2023

The day started with issues with Microsoft products. Since our products are heavily dependent on Microsoft, so if Microsoft has some issues, our products also have issues. So, for almost the whole day there were some issues, like Teams, Azure, and Outlook among others not functioning properly. I spend the day preparing and sending a generic message to partners regarding the Microsoft issue and its effect on the functionality of our products. Apart from the issues, I had some partner calls, I had an interesting issue regarding multilingual installations in a customer's tenants. This was a complex ticket, so I needed some help from a senior support engineer, and we are still looking into the issue. There were other several tickets for the day as it was a busy day.

Users may be unable to access multiple Microsoft 365 services

MO502273, Last updated: January 25, 2023 8:40 AM
Estimated start time: January 25, 2023 8:26 AM

Affected services

Microsoft 365 suite

Issue type

Incident

Issue origin

Microsoft

Status

Investigating

[Manage notifications for this issue](#)

User impact

Users may be unable to access multiple Microsoft 365 services.

[Are you experiencing this issue?](#)

[Is this post helpful?](#)

All updates

January 25, 2023 8:27 AM

Title: Users may be unable to access multiple Microsoft 365 services

User Impact: Users may be unable to access multiple Microsoft 365 services.

Current status: We're investigating a potential issue and checking for impact to your organization. We'll provide an update within 30 minutes.

Figure 2. Microsoft issue

Figure 2 shows the issue that we faced during this week. From the figure, we can see the type of issue, which service it is affecting, the possible reason for it, and the status of the issue.

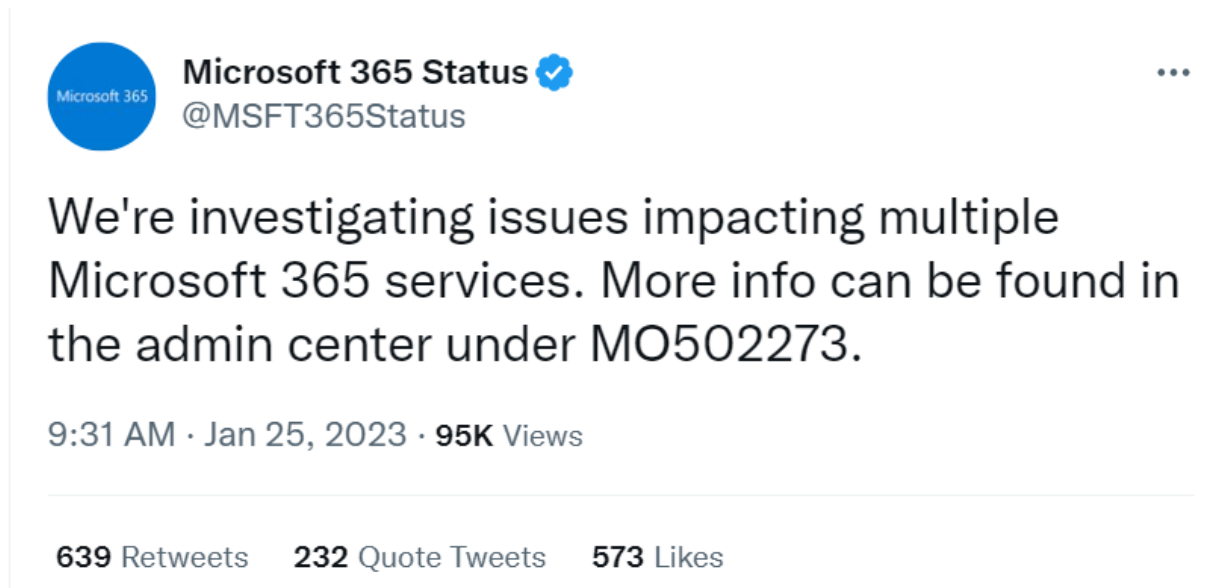


Figure 3. Microsoft's tweet regarding the issue

From Figure 3 we can see the update Microsoft provides using social media, Twitter to inform Microsoft users of the potential issue that is going on and re-directing users to check service health in the admin center to get more information on the issue.

Thursday 26th January 2023

The goal I set up for today is to follow up with pending tickets. Sometimes we have pending tickets due to unresolved bugs or partners not reaching out. So, I needed to reach out to partners and the development team regarding old bugs and information on their status, so I could communicate it to the partners. The Microsoft issue from Wednesday seems to be gone and the products seem to work normally again. This day I learned about bug fixes and how bug fixes are pushed via Fastlane and how different environments can have bug fixes at different times depending on which branch they are connected to. I had been working on an issue that seemed to be a bug, so I needed to test this on a different tenant, and I was able to reproduce the issue and report it as a bug.

Friday 27th January 2023

The goal for the day was to investigate an old issue in the customer's environment. It was an interesting and complex ticket that I was working on. I had a call with our partner to see the issue in detail, as I had been working on the ticket for a while and created different scenarios where the product wouldn't work as expected. After getting access to the customer's environment, I got more insights into the issue and worked on the issue to resolve it. Sometimes, it can get more complicated due to different customizations customers have done and we are not familiar with the

environment. The issue took quite a long time and involved communication with the developer as well and the issue is still ongoing.

Week analysis 1.

Overall, the week has been quite interesting and busy week. I am quite happy with the outcome of the week and when reflecting, I can say that I took a lot of tickets that were quite new to me and complex. Trying to solve these tickets has made it possible for me to learn a lot of new things and has improved my investigation skills. Some tickets needed a lot of effort to try and replicate the issue This was the first time I had a lot of partner calls. I was looking at different kinds of tickets and trying to recreate and solve a lot of these issues. I had tickets related to all three products, so I can say that my understanding of the products has grown.

This week, I also had a lot of partner calls. This was something very new for me and since I am aiming to improve my communication skills, this was crucial for me. Learning to listen, mastering talking on the phone (call), writing effectively, and collaborating well with remote teams are some ways we can improve our communication skills, so setting up more partner calls is in my opinion quite crucial to improve my skills (Maddocks 2019). I was more confident at the end of the week when dealing with partners on a call than I was at the beginning of the week. I also got more insights into the customer environment and learned how they utilize our products to maximize and improve their internal communication. I learned different ways our customers use the product to make the product more effective and efficient and how they use all the different features available in the product.

Even though this was a busy week, I was quite happy with the outcome of the week. At the end of the week, some issues were solved, but some issues still need more work and more investigation. So overall an interesting week, I am happy with the number of calls I had as this is something I am looking to develop personally. The calls with partners as effective as they help to understand the issue in detail and resolve the issues quickly. It also helped me with my confidence and communication skill as I feel like these skills have slowly been improving. For the next week, I still have issues from this week to solve.

3.2 Observation Week 2

The theme that I had set up for the week is being independent. To improve my skills, I need to be as independent as possible. By focusing on being independent, I aim to read as many online articles as I can about Microsoft products, ecosystems, and internal documentation and read older tickets from our products.

Monday 30th January 2023

The goal I have set for this week is to be as independent as possible while solving complex tickets. The week started normally, I went through older tickets and started replicating the issues on my end. I received a ticket where updating the customer tenant to the latest version of our product resulted in web parts stopping working. The customer sent a screenshot of the errors they received. This was a familiar issue, so I wanted to check if the customer had all SharePoint apps updated, so I asked the partner to check the app versions which eventually turns out one of the necessary apps was still in the old version, so they had the issue but after uploading the required package it started working. During this case, I realized that not all partners understand the SharePoint product very well and do not know how to read technical errors, so I needed to communicate to them with proper steps and pictures so that they could follow what needed to be done. I found an interesting article on configuring an App catalog in SharePoint. The app catalog is a special site collection that has all the apps we need (Beyond Intranet 2023).

Tuesday 31st January 2023

My goal for the day is to solve an issue where the partner had issues with loading web parts. I set up a call with the partner. The issue was that some web parts were not loading, and it seemed there were not enough permissions, but after checking on the partner environment for around 1 hour, we were not able to figure out the issue. Despite that, I was happy with the outcome as I was confident enough during the call that I could handle the issue without much stress. After the call, I checked with our senior support engineer and it turns out we needed a new authentication certificate, so I instructed the partner accordingly, but I have not received information on how it went yet. The rest of the day was normal, looking at tickets and solving issues.

Wednesday 1st February 2023

Apart from work-related technologies and tools, I am also trying to improve my programming skills. During this time, I have react course from Haaga-Helia and I am trying to improve my react skills. This skill can also be useful for me in working in the long run, so sometimes during the downtime, I use the time to learn and practice programming skills. On this day, apart from work-related activities I also spent some time learning and practicing React. I learned about components, state & props, handling lists, networking, etc. I learned how about Fetch & Promises, the useEffect hook in React. Overall it was an eventful day, and I was able to learn something more about topics that I was interested in. I got hands-on experience while working on some practical assignments.

Thursday 2nd February 2023

I did not have anything special on this day apart from normal tickets to solve. The tickets were something that I was familiar with, so I did not have much to learn on this day. I spent some time following old bugs and tracking their progress as some partners were asking for updates on these issues. So, I reached out to different stakeholders trying to find out relevant information.

Friday 3rd February 2023

On Friday, I had a follow-up ticket from a while back regarding some issues with the naming policy in our second product. Microsoft does not allow special characters in names, so using these characters can lead to some inconsistent results, so I spent some time reading Microsoft documentation related to Microsoft Graph (Microsoft 2022e). While solving this issue, I got an opportunity to learn more about Microsoft Graph, the different permissions required to be able to create groups, and the properties required while creating groups. Figure 4, below shows different properties and their data types in Microsoft graph with its description.

Property	Type	Description
displayName	String	The name to display in the address book for the group. Maximum length: 256 characters. Required.
mailEnabled	Boolean	Set to <code>true</code> for mail-enabled groups. Required.
mailNickname	String	The mail alias for the group, unique for Microsoft 365 groups in the organization. Maximum length is 64 characters. This property can contain only characters in the ASCII character set 0 - 127 except the following: <code>@ () \ [] " ; : . < > , SPACE</code> . Required.
securityEnabled	Boolean	Set to <code>true</code> for security-enabled groups, including Microsoft 365 groups. Required. Note: Groups created using the Microsoft Azure portal always have <code>securityEnabled</code> initially set to <code>true</code> .

Figure 4. Properties required while creating groups in Microsoft (Microsoft 2022d)

Week analysis 2.

Despite of relatively quiet week, I believe I learned a couple of things during the week. The first thing I learned was there can be different dependencies that can affect our product, so we need to

deep dive to find the solution despite everything looking normal there can be some external factors that affect our product. So, it is important also to communicate internally, if some errors have already been reported and if someone has managed to find the right solution, this can save time for us agents and also for the partners, which also saves time for the customers.

I also learned about Microsoft Graph and the amount of data we can access using Microsoft Graph. Microsoft Graph offers a single endpoint, <https://graph.microsoft.com>, which provides access to important and useful data in the cloud, which includes M365, Windows, and Enterprise Mobility along with Security. There is still a lot to learn about Microsoft Graph API as it is quite big and a lot of things to learn. I also feel like my confidence during partner calls has been improving, I feel more comfortable now while speaking with partners and my ability to debug problems during a call has seen some improvements as I can convey my messages efficiently and take charge during the call.

I also had some time to put effort into learning React during the week, which I believe will help my work and ability to help our partners better. React is a JavaScript library created by Facebook, it is a user interface library that is a useful tool for building UI components (Herbert 2022). As some of our templates are developed using React and are component-based, I think learning and understanding these codes are important for me to progress in my work, so I am happy with it. I also learned about Azure client secrets and how to generate and update them. This issue came up with a ticket, so I had to spend time learning about it. Microsoft documentation was quite helpful to solve the issue (Microsoft 2023b). As the theme of the week was being independent, I was happy with the outcome as I was able to resolve a lot of these issues independently.

3.3 Observation Week 3

The theme for this week is customization. I want to focus on and improve my customization skills as our templates are customizable partners and customers want to customize these to suit their needs. So, having this skill is very useful, even though I can help partners with basic customization, I eventually want to be able to make more than basic changes, so I want to focus and improve my skills in customization.

Monday 6th February 2023

Monday started with checking older tickets, that were still unresolved. There was an issue where the preview of the document in the web part showed a middle section of the document, and the customer wanted the top part of the page set to be in a thumbnail. However, after reading some Microsoft documentation, it was concluded that this is normal behavior and cannot be changed. I initially was exploring if we could use some CSS or custom template to make it work as the

customer wanted but after testing, I realized that this is not possible with these options. This was kind of a new request, so I had to spend some time testing and learning about it. Another issue that was new for me was in our Events site, recurring events were not being filtered by category of the event as it was leading the page to be in a continuous loop as nothing happened until we refreshed the page. After some testing, it occurred that this was caused due to some issue with POSTQUERY which was leading to some unknown error, and after discussion with the development team it was for now concluded to be some issue with Microsoft and this is still being investigated. From Figure 5, we can see an issue with postquery, in the network tab in the browser console. This is very important in troubleshooting problems.

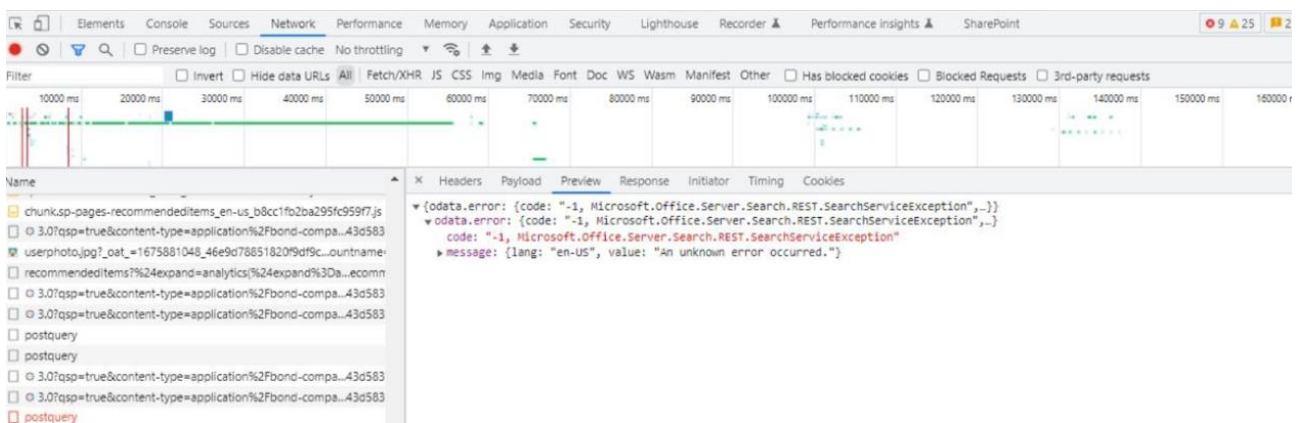


Figure 5. Issues with post query

Tuesday 7th February 2023

At the end of the day on Monday, I received a ticket from a partner who was having an issue with installation on his tenant. My goal for the day was to help partners with the issue so that they can start using our product and learn about it. After going through his ticket history I realized that he was trying to install our latest version which did not succeed and again tried to install the previous version, which was then causing a lot of issues. So, it took me almost a whole day to work on the ticket. After reading the log, I noticed there were several issues. The first issue was the incorrect PowerShell version, which can cause issues. Then there was an issue with Azure cognitive services, it was causing unnecessary errors during installation, so after correcting the PowerShell version and fixing the issue with Cognitive services the installation went smoothly. Since the partner was unfamiliar with our product, it was difficult to navigate through issues so we tried to solve the issue on a call. After a lot of investigation, I was able to help the partner resolve the issue. Tuesday was an eventful day. I also got a chance to learn about a new Sharepoint feature,

where editors can save private drafts before sharing them with others, this is a new feature in SharePoint that was introduced in September 2022.

Wednesday 8th February 2023

My goal for the day was to help a partner with customizing a template as they need. A customer wanted to display the category of the event in their event web part, so I helped partner with the customization. It took me a while to test and solve this issue. I received tickets from all of our products with different issues. It involved a lot of testing. A particular ticket with our third product was tricky, as the Title and the Author of the news article were not rendered when the news page was opened in the Teams app on the mobile device. So, I tested this issue on both iOS and Android devices, as the tricky part was this was working on the Teams app on a desktop but not on a mobile device. So, I am still waiting for some additional information from the partner, as I was not able to reproduce the issue on my end so I am not sure what could be causing it. Similarly, there was another issue with external users as web parts were not rendered for them, so it primarily could be a permissions issue as SharePoint requires different permissions for content to be shared with external users.

Thursday 9th February 2023

I received a ticket that was related to Azure, with some warning regarding certificates in App Service. We use Azure App Services to host some web apps and certificates for authentication. So, this ticket was related to SSL certificates for all incoming requests. I am still working on this issue as I am not familiar with the customer environment and I am waiting for additional information for the partner. We recently launched a new version of our product 3, so a lot of customers' environments are being updated to the latest version. So, I received a ticket where one of the functionalities was where users can set widgets as they need, and the changes were not being saved. This seemed to be some issues with the .json file from the older version still being used rather than the newer one, so I needed to test to figure out what could be causing this issue. I am still working on the issue.

Friday 10th February 2023

The tickets I received on Friday were all about updates and installation issues. So, my goal for the day was to help partners solve their installation and update issues as much as I could. It involved reading a lot of error logs and suggesting to partners what they could do next to fix the issue. There was one particular issue that involved a thorough investigation and took a lot of time. This ticket was from a partner who had an installation issue on Wednesday. He was trying multi-intranet functionality and there were errors during the installation. This was related to SharePoint Term

Store, he wanted to create a new installation under a new Term and this was causing an issue with applying PnP templates, this is not a supported scenario. I have suggested the next steps to the partner and now waiting for a response from the partner if the suggestions helped with the issue.

Weekly analysis 3:

I believe this week, I have learned a lot of things which has helped me develop my skills. The first important point was working with a new partner who is not familiar with the product and overall with SharePoint. So, working with someone with little to no knowledge of this can be particularly tricky as we need to do a thorough investigation of what they have done so far and what could have gone wrong. So, when I worked on this case I had to go back and forth a lot of times with this partner. I learned about different issues, I also got a chance to work with PowerShell, so I learned more about this as well. This has given me the confidence to work with people with little knowledge of our product or SharePoint in general.

I also got to read about new SharePoint features and Azure as well. I did a lot of reading and research on these topics during the week to help with partners. Since last week, I had been reading about external users in SharePoint and O365 in general. I learned how external users can be given access to internal content and the different levels of permissions that can be possible to be granted. There are different places where permissions are involved, so all of these need to be checked thoroughly. Since I received quite a few tickets for our third product and issue with updates and installation. I had to test different scenarios, so I learned about different issues with our new products and learned about the possibility to make it simple for our partners and customers. I have been able to provide feedback to our developer regarding the issues faced.

When working with Microsoft products, it is important to keep track of changes from Microsoft and how they can impact the different features we provide. So, I spent quite a lot of time reading from different MS-related blogs, and when working with PowerShell I read a lot of different blogs. This week involved a lot of readings and working with different products and features. In conclusion, this week was very important in terms of learning and development. I also feel more confident with working with new partners and confident in my ability to deliver messages and ability to read different issues in different kinds of environments and products. However, since my theme was to focus on customization, there were not a lot of requests regarding this, so I did not learn and test my skills as much as I would have wanted to.

3.4 Observation Week 4

My theme for the week is to learn more about SharePoint, Term Store, and Graph API. These are quite important in my job, so learning as much as I can about these topics will help me, so I want to

focus on these as much as I can during this week and also take on tickets related to issues with these.

Monday 13th February 2023

My goal for the day is to follow up with all older tickets, that have been pending for a while, and reach out to partners if they need additional help, or if the issue has been resolved. I also set a goal to learn more about Term Store in SharePoint as there was a case where the partner was working with multiple Term groups, so I needed to read how best to work with Term Stores. I found an article that was interesting and also insightful. I had a case where User Interface was affected when a user in Azure Active Directory has a long name, so after testing and reproducing this, the solution was to come up with custom CSS, which helped with the UI, and the problem was resolved. As I had been working on a case with the partner regarding multiple term groups, I spent the majority of the day working on the issue with the partner, diving deep into documentation, and finding relevant blogs to help solve the issue.

Tuesday 14th February 2023

The goal I had for this day was to test different scenarios with Event functionality, which was breaking with certain regional settings in SharePoint. I tested different settings scenarios on my tenant to find out if the issue was occurring due to specific regional settings or if it was happening with more than one regional setting. Regional settings in SharePoint can be set in multiple places, it can be on SharePoint online, or it can also come from Delve. I was reading a few online materials on this. The issue that I had was a bug as the issue was only occurring with a regional setting set as Dutch (Belgium) in SharePoint online. I spent the day testing different scenarios and learned about different settings in SharePoint and connection with user profiles in Delve.

Wednesday 15th February 2023

Wednesday, I received a ticket regarding the extension of our product being set to a plain SharePoint site. Despite using our product, the customers can use Out Of The Box (OOTB) SharePoint features like having a plain SharePoint site but for some reason, our product's extension was being applied to the customer's SharePoint communication site. So, my goal was to investigate this issue and what could be causing this. So, I learned about application customizer as this could be the cause of the issue. It turns out indeed that the application customizer was causing this issue, so the goal is to find out a way to remove the application customizer from the site. It is possible to remove the customizer with the help of PowerShell. Figure 7 shows the script used to remove the application customizer.

- Use PnPowershell
 - Connect-PnPOnline <https://.sharepoint.com/sites/>
 - \$apps = Get-PnPApplicationCustomizer
- List founded apps
 - \$apps

In case there's multiple ones you need to remove the one which have Scope **Site**

- Remove-PnPApplicationCustomizer \$apps[1]

Figure 7. Removing application customizer using PowerShell

Thursday 16th February 2023

I received a ticket where HubSite in SharePoint was not being updated to the latest version. So the goal was to investigate more on the issue as to what could be causing this. After asking the partner a couple of questions, it turns out that all associated sites were updated but not the hub site, so the goal is to figure out the issue. I am still working on this as I have not yet received an update log from the partner. Apart from solving tickets, I spent the day reading older logs from different partners trying to figure out what had caused similar issues in the past. The ability to read and understand logs is quite an important skill to have in this job as it can help us resolve issues quicker.

Friday 17th February 2023

Microsoft Graph API is very important at my job. All the data we use comes from Graph API. I know some basics about Graph API, and I have set a goal that in these 8 weeks I will learn as much as I can about Graph API. So, I spent some time learning about Graph API, its basics, and the best practices of Graph API. I had a ticket where it was quite difficult to find out what was causing the issue, it turns out it was caused due to corrupted token, which we found out from Graph API. Figure 8 shows Graph API and sample queries.

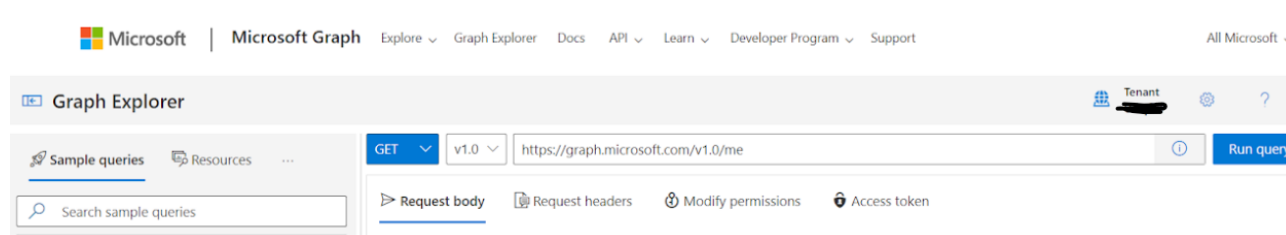


Figure 8. Graph API

Weekly analysis 4:

This week was equally important as previous weeks when it comes to learning and developing personally. As my main goal is to tackle bigger and more complex issues, this week was exactly what I was hoping it to be. I believe that I have learned quite a few things about Microsoft ecosystems, our products, and, the customer environment. Problems like working with multiple Term groups, creating multiple term groups during installation of our products, and creating how multiple Term Groups while installing multi-lingual in the same tenant can be affected by different Term Groups. I spent some time reading about Term Store, its management, and what can we do with these Terms. I found a blog where these were explained in detail, A basic guide to Term Store Management in SharePoint Online (Quentin 2023).

This week I spent quite some time researching different possibilities that come with Regional settings and user profile settings in Delve. How these settings affect the usability of SharePoint online and its effect on different functionalities of our product. I found quite interesting information about these settings from one website which helped me understand and navigate through these settings. The article is about modifying SharePoint regional settings to use further in SharePoint design elements (ShortPoint 2021). I learned that some regional settings can affect our functionality and cause it to break, so this could be something critical and needs to be fixed. Different customers from different regions have different regional settings, so products should not be affected by these settings. Delve is mostly about personal user settings, where users can set different time formats, time zones, languages, etc. and these settings do not affect other users' profiles or settings.

I was also able to spend additional time learning about Graph API. Graph API is quite vast it takes a lot of time to be an expert in this, I have been spending as much time as possible learning about it during my downtime. I am glad that I was able to put in some time this week, there is always more to learn about Graph API. I found an interesting article on a beginner's guide to Microsoft Graphs. Through Microsoft Graph API, we can access different kinds of entities like Microsoft 365 groups, teams in Microsoft Teams, and files in the SharePoint document library, they are all connected (Kokkarinen 2022). I believe I learned more about Graph API, but this subject is quite vast and I plan on spending more time learning about it in the future as well. To summarize the week, I learned quite a bit about Microsoft products and features. This was a good week of learning.

3.5 Observation Week 5

This week my focus will be on improving my customization skills and learning about handlebar templates. I spent some time during the third week learning about customizations, so I intend to continue with it also this week. We use handlebar templates, so learning this skill will help me with the customization and improve my skills. Templating language like Handlebars utilizes an input object and a template to produce HTML. They look similar to regular text but they have handlebars expressions (Katz 2021).

Monday 20th February 2023

I started the day by checking older tickets and continuing with issues from the previous week. My goal for the day was to better understand our product's widgets which allow users to have access to different Microsoft features like To Do, latest e-mail, recent documents, documents shared with the users, etc. How does it function and what kind of permissions do we require to use those widgets? I received a ticket with a similar issue, I wanted to focus on this subject to better understand where the issue comes from and how I could solve it. We use widgets like ToDo, My Conversations, My Events, My News, My Profile, etc. And these widgets require different permissions from Microsoft Graph. After checking their network tab and noticing that the error was related to a permission issue, I learned that the issue was due to a lack of permissions. I spent some time learning about the Handlebar template on this day. I used their website to get information on the topic.

Tuesday 21st February 2023

My goal for the day is to improve my understanding of managed properties that SharePoint uses to make SharePoint search easy. The search index consists of important contents and metadata, which are called Managed properties. To make the search easier we map crawled properties to managed properties (Microsoft 2022f). I received a ticket, where the document title was shown two times for pdf files. Since SharePoint uses the managed property to make the search easier and render results this could be caused due to some issues with managed properties. I did some reading on the managed properties on SharePoint online, this helped me understand this feature better. Managed properties are great to use powerful query functions like highlighted content web part and keyword language (Clark 2022). I am waiting for a response from my partner to do more testing on this and solve the issue. From Figure 9, we can see the different property name and which crawled properties they are mapped to. As seen in the picture, AboutMe is a managed property, which has been mapped with crawled property `ows_Notes` and `people: AboutMe`.

New Managed Property

PROPERTY NAME	TYPE	MULTI	QUERY	SEARCH	RETRIEVE	REFINE	SORT	SAFE	MAPPED CRAWLED PROPERTIES	ALIASES
AADObjectID	Text	-	Query	-	Retrieve	-	Sort	Safe	People:msOnline-ObjectId	
AboutMe	Text	-	Query	-	Retrieve	-	-	Safe	ows_Notes, People:AboutMe	
Account	Text	-	Query	-	Retrieve	-	-	Safe	ows_Name	
AccountName	Text	-	Query	Search	Retrieve	-	-	Safe	People:AccountName	

Figure 9. Example of managed property

Wednesday 22nd February 2023

For this day my goal is to continue with handlebar templates and try to customize some templates we have using the methods shown on their website. Apart from the handlebar template, I also got a chance to work with PowerShell issues. A partner was having an issue with the installation using PowerShell and was running into an issue with Connect Az-Account, the error was referring to the term not being recognized as a name of a cmdlet. A cmdlet is a command that is used in the Windows PowerShell environment (Bigelow 2023). This issue could be due to several reasons, like the correct module not being present or not yet being imported or the version of PowerShell needed to complete the installation not being correct. I suggested to the partner to run `Connect-AzAccount -tenantId "XXXXX" -subscription "XXXXX"` in PowerShell first, this seems to have helped and solved the issue. This cmdlet makes a connection with the mentioned tenantId and subscription.

Thursday 23rd February 2023

I continued with my customization learning effort. I was able to make some customizations using custom helpers. There is a lot to learn on this topic, so I will still need to put in a lot of hours to fully be able to utilize this to make customizations as needed. I also received questions related to Azure cognitive services and its use to make translation easy for content creators. Our product provides two options, one is to use Azure cognitive services and make the translations or use Google on-page translations so I need to know what differences these both have and what it means to data if one of these services is used. I learned that using Google Translate API, the text is held briefly in memory to perform the translation and return the results, so this could be an issue for customers who are sensitive about data protection.

Friday 24th February 2023

On Friday, I received another ticket regarding managed property in SharePoint. The goal for the day is to continue with my previous learning. I spent the majority of the day trying to recreate the same situation as my partner so that I could come up with a solution to their problem. Sometimes, in SharePoint, it takes a lot of time for change to be reflected and pages need to be crawled. So,

the changes might not be reflected immediately, so we need to wait for some time. This case was something similar, when crawled properties are mapped to managed properties, it might not start working immediately, so we need to wait and try this again after some time. Crawled properties are resulting properties after the indexer crawled the contents of the SharePoint site (Clark 2022). We might also need to reindex the document library connected to that property to make it work.

Weekly analysis 5:

This week as expected, I was able to learn about handlebar templates. I learned how to install Handlebars and use it to make customizations. Handlebars excel at rendering non-HTML text content and facilitating server-side rendering of pure content, making them a suitable option for CLI apps (Katz 2021). We also need to understand when not to use handlebars, it is not good for fast, incremental updates of the DOM, event handling, and frontend-backend communication. This was a great learning experience for me, I will need to give more hours to learn and practice handlebars.

Apart from learning handlebars, I also had a great opportunity to learn about managed and crawled properties that SharePoint uses to make SharePoint search easy. I got to work on tickets related to these properties and solve them. I read articles on these properties and learned about the differences between crawled and managed properties. Crawled properties are resulting properties after the indexer crawled contents of the SharePoint site, whereas managed properties are higher level than crawled properties as we can use these while querying and manipulating metadata (Clark 2022). Both of these properties can be found on the search schema (figure 10) page inside the SharePoint admin center. From here we can manage different search settings.

Search

Manage Search Schema

Create and modify search properties so that users can query these properties.

Figure 10. SharePoint search schema

Search is a big part of SharePoint and learning how to use it effectively will be quite important while working with SharePoint. Apart from learning handlebars and SharePoint properties, I had

some tough tickets to tackle. The tickets were related to different products with different issues. I had to spend quite some time reproducing the issues and trying to find solutions. I had a couple of calls with partners, where we had screen-sharing sessions to understand their issues better and suggest to them what their next step should be. The issue related to installation was quite hectic as the partner had been doing something wrong from the very beginning, so I had to read quite a few logs to better understand the issue and guide the partner. Then sometimes, the error messages are generic and do not provide the exact issue, so this might take some time to dive deeper to understand the issue.

Similarly, it is also quite challenging to make partners understand basic features and what they do if they do not have sufficient technical knowledge, so this can also take quite some time to solve the issues. I had a similar experience this week with an issue related to translation services, so I had to jump on a call to explain to the partner the use case of different services we use and how they differ, and how they can use these services. I had another case where a partner sent screenshots of issues without providing details about the issue, so it was also quite hard to reproduce the issue, so jumping on the call helped to solve the issue. Sometimes, the partner and customer forget to add a different kind of permissions needed, and they mistake it as permission has been provided, this can cause different issues so double checking helps to resolve the issue faster and it was a similar case with the issue the partner had.

In conclusion, this week was a good learning week with different kinds of tickets related to different features and dependencies that affect the partner. I am happy with the outcome and I was able to achieve my weekly goal of learning more about customization and handlebars that we use in our products. I am also happy with the outcome that I was able to learn more about SharePoint search, managing search schema, crawled properties, and managed properties. By modifying the search schema, it's possible to tailor the search functionality in SharePoint within M365 to meet specific requirements. Similarly, as my bigger goals have been to learn more, gain more confidence, and improve my problem-solving and debugging skills, this week has contributed to that. There are still some tickets that I wasn't able to solve due to a lack of information from partners, I hope to be able to solve these next week and continue the week with these issues.

3.6 Observation Week 6:

This week, I aim to understand more about the different Azure resources used in our products. These include functions app, application insights, access tokens, etc. Our product depends on these resources for different purposes, so I will try to focus on issues related to these and learn as much as possible.

Monday 27th February 2023

Monday started with catching up with tickets from the last week. There had been several tickets that I needed to investigate, as they remained unresolved last week. Examples are some error notifications that remained unidentified, so the aim was to investigate them. This was my goal for the day. Our functions are hosted in Azure, so we can see the logs from Azure when we have some issues related to a particular function. But this issue needed to be debugged by the developer by checking the code base, however, we disabled the function and after checking the issue again for some time the issue was not reproducible anymore. Azure Functions is a serverless offering that empowers the execution of code triggered by events, all while eliminating the need to manage underlying infrastructure (serverless360 2023). Apart from learning about this, there were some simpler tickets to solve this day which did not contribute to any additional learning for me.

Tuesday 28th February 2023

On this day my goal was to continue learning about Azure resources. I received a ticket where the partner had an issue updating one of our products to the latest version, after reading the log I realized that they were missing one of the requirements needed for the update process. The environment which is used for the update purpose needs to have Web Deploy, but the partner was missing it in their environment. Web Deploy(ms-deploy) simplifies the deployment of Web applications and Web sites to IIS servers (Mittal 2022). This is a new requirement for our product and a new topic for me to learn. Downloading Web Deploy and running the update again helped with the issue.

Wednesday 1st March 2023

My goal for the day is to help a partner with investigating an issue where our product was not working after updating to the latest version. This ticket had been going on for several weeks and it was hard to solve the issue as the partner working on this issue was new to our product, so my goal was to investigate the issue and help him resolve it. After being on call and checking on all the Azure resources and Azure AAD, we were able to figure out some configuration issues. After, fixing the configurations, we were able to resolve the issues. Azure AAD or Azure Active Directory is Microsoft's identity management service, and it is cloud-based. It allows employees to access different cloud services with a single set of login credentials (Simplilearn 2023). If there isn't proper configuration and permissions in Azure AAD, users could run into different errors while trying to access functionalities of the product, so proper configuration is important for everything to function smoothly. I was able to guide the partner to resolve the issue while also improving my knowledge of Azure resources and Azure AAD.

Thursday 2nd March 2023

My goal for this day was to work with another partner issue, who had been facing issues with one of our products where M365 groups and analytics were not working. This issue is known and had previously been caused by the client's secret issue. This was resolved by creating a new client secret and updating the value. In this case, there is another layer in the middle, as they use a key vault, so this was a bit more complicated issue. Azure key vault is Microsoft's cloud service which allows users to store and access secrets securely. Secrets are kept in a central store and are protected by high-standard algorithms (IntelliPaat 2023). I am still looking into the issue as the partner seems to have some other issue related to authentication failure.

Friday 3rd March 2023

My goal for the day was to continue looking into tickets from earlier this week and follow up with bugs. Since this week I had been focusing on developing my Azure knowledge and focusing on such tickets there had been some issues unresolved. So, I reached out to my senior in the team to seek help and work on the tickets. Apart, from looking into issues from earlier in the week, I did not learn anything new this day but rather deepened the knowledge I got throughout the week. I am happy with the result of the day, as I was able to resolve some of these complex issues.

Week analysis 6:

The week had been quite busy as we had some issues with our ticketing system (Zendesk), which resulted in us getting more tickets than usual, and with the winter holiday, we had fewer people working. So, the workload was much more than usual. I had some partner calls, looking into issues together with the partners and investigating these issues. This helped me with resolving faster than usual, as some of these issues needed a lot of information so instead of going back on forth, it was easier to resolve the issues over a call.

My focus for the week was to learn as much as I can about Azure. There were quite a lot of things to learn in Microsoft Azure. During the week I was able to learn about the functions app, application insights, access tokens, resource groups, Azure AAD (Active directory), and Azure key vault. Some of these topics have been defined earlier. Application Insights is quite a useful tool in our work as it allows us to understand how different app functions are performing. Application Insights (figure 11) is an advanced data analytics tool that helps in diagnosing the application issues raised (Velagana 2023). This also allows us to find out different data like which pages are the most popular, and where our users are, and provide diagnostic events logs from our app. So, I spent quite some time setting up application insights and checking out the different data it provides.

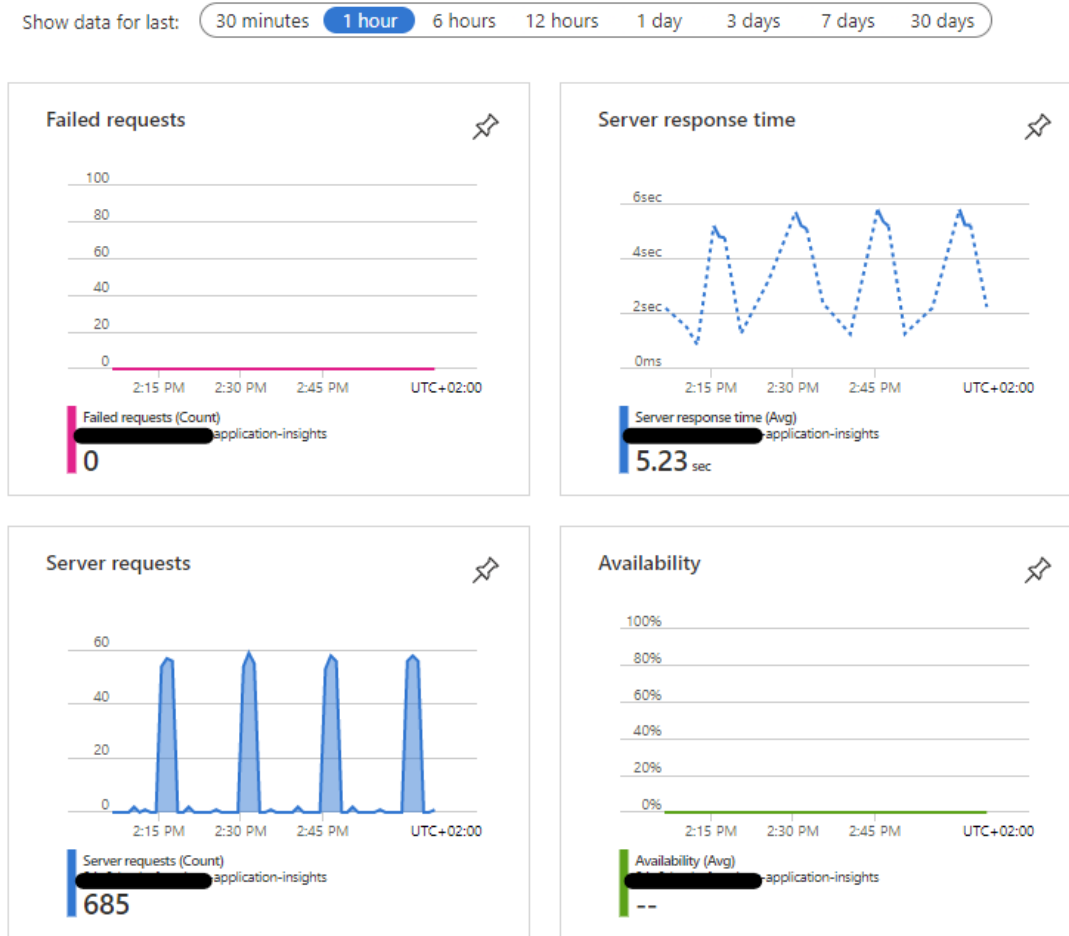


Figure 11. Some examples of data provided by application insights

Figure 12 shows, the performance metrics of different functions used in our product. This helps us understand what functions are performing well and which ones are not performing as they should. The data from application insights helps us improve the product and ensure the customers get a good product.

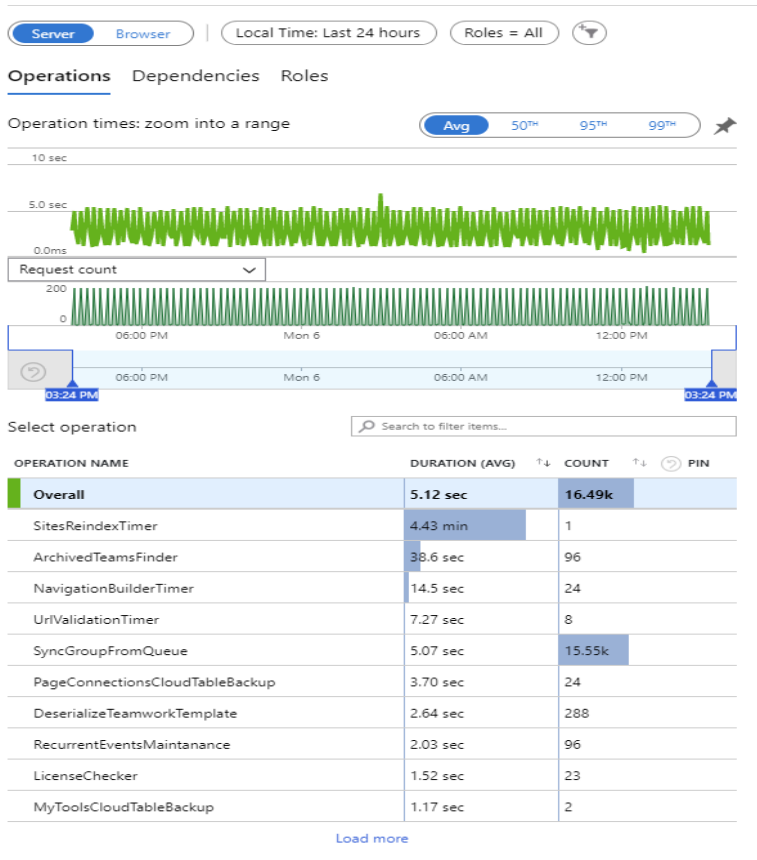


Figure 12. Average performance metrics from application insights

From Figure 13 we can see some functions hosted in the Azure functions app, here we can test these functions if they are working well and we can also access logs when the functions are invoked in case there are some issues, we can try to debug the issue with help of the log.

<input type="checkbox"/> Name ↑↓	Trigger ↑↓	Status ↑↓	Monitor ↑↓
<input type="checkbox"/> AcknowledgeDocument	HTTP	Enabled	Invocations and more ***
<input type="checkbox"/> AddMultilingualPageConnection	HTTP	Enabled	Invocations and more ***
<input type="checkbox"/> AddMultilingualSiteConnection	HTTP	Enabled	Invocations and more ***
<input type="checkbox"/> ApiProxy	HTTP	Enabled	Invocations and more ***
<input type="checkbox"/> ApplyValoTheme	Queue	Enabled	Invocations and more ***
<input type="checkbox"/> AppVersion	HTTP	Enabled	Invocations and more ***

Figure 13. Some functions hosted in the function app which is triggered by HTTP

Similarly, I learned about Azure Active Directory (AAD). Azure AD as mentioned earlier is used for identity management. I spent time reading about best practices while using Azure AD. Role-based access, multi-factor authentication, conditional access, etc. are some points we need to focus on

when users have access to different data we provide. Role-based access concept allows IT to follow the concept of least privilege and help to establish zero trust security approach (Worthington 2022). I found this article by Worthington, which was quite informative and helped me understand Azure Active Directory in detail. We can enable different services from AAD, like single sign-in, MFA, and audit security regularly. Single sign-on improves security through modern authentication protocols and make it easier for users and helps reduce the number of times they need to log in. Similarly, we also use access tokens, which allow clients to securely call protected web APIs. These are used to perform authentication and authorization.

Overall, this week has been quite interesting and very rewarding for my personal goal that I set at the beginning of the week. My goal was to learn as much as I can about Microsoft Azure, as our products quite heavily use Microsoft Azure for different purposes. I tried to take as many tickets as possible related to these issues and solve them. I had the opportunity to read different articles related to Azure. At the end of the week, I can say that I have learned more about Azure, and I am happy that I was able to achieve the goal I set at the beginning of the week.

3.7 Observation Week 7

This week I will continue focusing on Azure and other Azure resources we use in our product. There are a lot of other resources, on which our products depend. So, I will put my focus on learning about these resources.

Monday 6th March 2023

My goal for the day is to carry on with my older tickets. There had been a few tickets from last week that I need to continue with. So, my focus remains on solving these issues. I had a ticket where a partner was getting errors in their log which was related to login. In one of our products, connections are supported. If multi-factor authentication is used, there are errors while logging in, and in case customers need to have the multi-factor authentication enabled, it is possible to not use the service account. Service accounts are a special type of account that is intended to represent non-human entities like an application or API (Microsoft 2022g). I needed to explain to the partner how to carry on with this problem and how they can create a service account.

Tuesday 7th March 2023

My goal for the day is to tackle a ticket, which I received on Monday. This was a complicated issue, where multiple tabs were loading with an infinite looping, and the error messages did not help read the issue. This product is used inside Microsoft Teams, and the issue was happening in the Teams app on mobile, desktop, and in the browser. After diving deep to understand where the issue is

coming from, I was able to pinpoint it to the wrong URL address used in the tabs of the application. I suggested the solution to the partner, and I am waiting for a response from the partner if the solution helped the customer or not. Apart from this problem, I did not receive any other issues that needed significant effort.

Wednesday 8th March 2023

In product 3, which is used to render SharePoint pages to the Teams app the end user can set different widgets as they need. When they configure widgets as they need, the configuration page is saved to the user's personal OneDrive, in this case, every two days the configuration does not work, and the users don't see the widgets in the app at all. So, I spent time investigating the issue. This was a complicated case, and I am still working on it as I was not able to reproduce the issue, I am waiting for additional information from the partner. I had to spend time studying how OneDrive works and how our product uses the files saved in OneDrive to fetch and save data. OneDrive is another Microsoft cloud service, which allows user to store their data. OneDrive is deeply integrated with MS Office so that users can access different documents from OneDrive (Provazza 2023).

Thursday 9th March 2023

My goal for this day is to solve tickets related to product 2, which adds governance to teams created and provides a dashboard from where users can easily access teams, they are part of. This product supports all the teams created, either using the product itself, or from Teams or, the Microsoft admin center. However, there can be differences between these teams and the behavior can also be different. I received a couple of tickets related to this product, one was quite new for me, as the issue was the Team owner was not able to see the Teams where they are not added as members. When a team is created using our product, the team owner is added as a team member automatically but when a team is created from the Microsoft admin center, the owner is not added as a member. However, after several recreating the issue, I was unable to do so, I am waiting to solve the issue on a call with the partner. I was also able to spend some time learning more about the Microsoft admin center.

Friday 10th March 2023

On this day, my goal was to spend some time learning about Azure and continue with my learning from the last week. Tickets-wise, I did not have much to learn or do on Friday, so I continued with following up with tickets where I had not heard from the partners and following up with progress with bug fixes. I also spent some time reading about Azure from our internal documentation and configuring different Azure resources.

Week analysis 7:

In terms of achieving the goal I set up at the beginning of the week, I was not able to learn as much as I expected to this week. I was not able to put complete focus on Azure, I had tickets related to different products which needed a lot of testing and diving deep into the issue to find the right solution for the issues. This took most of my time.

Product-wise, I am happy that I was able to solve some complex issues, which helped me understand the dependencies of the product better. I learned about Azure service account, Microsoft Graph permissions, and OneDrive which are crucial for our products. There are three types of service accounts in Azure Active Directory, they are managed identities, service principals, and user accounts employed as service accounts. Service accounts are granted permission to access resources in Azure and Azure Active Directory.

I spent time going back to Microsoft Graph and its permissions in detail and the functionalities these permissions can influence as I faced some issues regarding this topic while solving some tickets. For example, we have a functionality that allows users to send the news created in SharePoint directly to the Teams channel or different users. So, to be able to do this, we need certain permission configured. This function needs delegated permissions like a `Directory.Read.All` `Team.ReadBasic.All` etc. From Figure 14, you can see some examples of permissions required for our products. For an app to access data in Microsoft Graph, permissions need to be granted by either users or administrators. There is more information available from Microsoft documentation regarding Microsoft Graph permissions.

Figure 14 shows some of the Microsoft Graph permissions required for our products. Also, we can see from the figure what these permissions do, which helps the user to understand the reason behind the need for these permissions.

Microsoft Graph (27)

AppCatalog.Read.All	Delegated	Read all app catalogs	No
AppCatalog.Read.All	Application	Read all app catalogs	Yes
Calendars.ReadWrite	Delegated	Have full access to user calendars	No
Channel.ReadBasic.All	Delegated	Read the names and descriptions of channels	No
ChannelMessage.Send	Delegated	Send channel messages	No
Chat.ReadWrite	Delegated	Read and write user chat messages	No
ChatMessage.Send	Delegated	Send user chat messages	No
Directory.AccessAsUser.All	Delegated	Access directory as the signed in user	Yes
Directory.Read.All	Delegated	Read directory data	Yes
Directory.Read.All	Application	Read directory data	Yes
Directory.ReadWrite.All	Application	Read and write directory data	Yes

Figure 14. some examples of permissions required

Since our product is very connected to the Microsoft ecosystem, there are a lot of dependencies and connections to different Microsoft products like OneDrive, and different M365 licenses and this can affect our product very much. So, it is important to understand the differences and connections between these products. Even though SharePoint and OneDrive have some crossover features, these are different products and for someone not familiar with this matter this essentially could mean the same. Both these products provide online space to access files, but they have different use cases. SharePoint is an online document management system and communication site, whereas OneDrive is a cloud storage solution (Ginn 2022).

Overall, the week was interesting, and I did learn new things even though it was completely not related to the goal I set at the beginning of the week, it still was related to the M365 ecosystem. For the next week, I will put focus on learning more about Azure resources and continue with the complex tickets from this week.

3.8 Observation Week 8

As mentioned at the end of week 7, I will be focusing on Azure and Azure resources during this week, along with my tickets.

Monday 13th March 2023

Monday started as usual with checking my older tickets, reaching out to partners, and communicating to the partners with new development and questions. I had some tickets from last week that

needed me to reach out to the partners. I received a ticket regarding SharePoint translation, which was causing some issues with the Language Switcher button after a page was translated using SharePoint Translation. Our product has a native translation possibility that uses cognitive services for translation and can use native SharePoint translation which can be used to create translated news and pages. For each page that is translated using SharePoint Out-of-the-box translation a new page is created with the language that is chosen (Microsoft support 2023). This translation service is different from the one that uses Azure cognitive services for translation. So, I spent the day investigating these differences and how this work differently.

Tuesday 14th March 2023

On Tuesday I received a ticket where a partner had an issue while updating their product to the latest version. They used PowerShell for the update and ran into an issue despite trying multiple times.

```
Cannot find specified AAD App. Error='Cannot find an AAD App by name or id. ResourceNameOrId='
Get-AzADApplication_List: C:\Program Files\PowerShell\Modules\Az.Resources\5.4.0\MSGraph.AutoRest\custom\Get-AzADApplication.ps1:206
Line |
206 | Az.MSGraph.internal\Get-AzADApplication @PSBoundParameters
     | -----
     | Unsupported or invalid query filter clause specified for property 'displayName' of resource
     | 'Application'.
[2023/03/14 12.34.41] WARNING: Cannot find specified AAD App. Error='Cannot find an AAD App by name or id. ResourceNameOrId='
[2023/03/14 12.34.41] ERROR: Could not resolve resource by Id: {0} Error code: 2106
```

Figure 15. Error message during the update

Figure 15 is a screenshot of part of the error that the partner ran into during the update process. So, I worked on the issue, trying to do some research on what the problem could be here and trying to find a solution for the problem. In addition to PowerShell, we also provide another option to use our installer, which can also be used for update and installation processes. The error message points towards an issue with the resource group in Azure, one of the requirements during the update is the user must be a contributor for the resources, so we checked a couple of things, and we managed to resolve the issue.

Wednesday 15th March 2023

On this day, I worked with some basic tickets which I was familiar with, so it did not contribute much towards learning new things. I spent some time reading about storage services in Azure, like Azure blobs, Azure files, Azure tables, and Azure Queues. We use these in our products, and they

all have different functions. They all have different functions and uses, so it was interesting to learn about the differences and their use cases. I also spent some time cleaning out my older tickets, which had been inactive for a while as there had not been any responses from partners.

Thursday 16th March 2023

Thursday was quite busy as we received plenty of tickets with different issues related to different products. I could learn new things and do some new tests which allowed me to learn new things. As mentioned earlier, our templates are customizable and customers can choose to customize as they need, so I worked with issues related to this. For our second product, users can use metadata at the template level while provisioning Microsoft Group, I had some tests to do with this feature as previously I had not had a ticket related to this issue this was something new for me. We provide Intranet in different languages for which we need a multilingual license and install the language hub site as needed, so I spent some time installing a new hub site with the Slovak language on my tenant as I had a ticket related to this language. This was an eventful day.

Friday 17th March 2023

On Friday, I continued to work on tickets from Thursday. I spent some time doing more tests and trying to reproduce some issues and find solutions for those issues. I also spent some time cleaning inactive tickets again. I spent some time continue reading more about Azure storage, Cosmos DB, and CDN. I was also able to learn the use cases of Azure storage and Cosmos DB and how we use these in our products. I learned how to configure these, and what kind of data they store. CDN is a content delivery network, and a lot of content is delivered through CDN for better performance of the product. We have our own CDN, which is used also to provide bug fixes, and this allows us to provide quick fixes to our customers in case some bugs are very critical and affects the usability of the products.

Week Analysis 8:

So, this week has been interesting as I had different kinds of tickets from all the products, and I was able to learn more about the different features of these products and had a chance to work with them. I spent a lot of time reading through older tickets, internet sources, and old Teams conversations to find solutions or the right direction for different tickets. We have technical documentation as well, which documents the installation/ update process, technical architecture, Azure, and SharePoint components, so I also had to read through the documentation a couple of times to find solutions to different problems or send these documents to partners to help them with troubleshooting.

Apart from solving tickets, I also spent time getting familiar with Azure storage and cosmos DB as we use these Azure resources in our products. Azure Storage is a cloud platform provided by Microsoft to solve modern data scenarios (Microsoft 2023c). Azure storage is easily available, highly scalable, and safe for different types of data in the cloud (Microsoft 2023c). I spent time reading about data services that the Azure storage platform includes like Azure Blobs, Azure files, etc. Here I explain some of these storage services. Azure blobs are object storage systems that are extremely scalable and can handle both text and binary data, with added functionality for big data analytics via Data Lake. Azure files are used for managed files for cloud or on-premises deployments. Azure Queues is a messaging store for reliable messaging between applications (Microsoft 2023c). As we can see in Figure 16, creating a storage account is a straightforward way.

Create a storage account ...

Basics Advanced Networking Data protection Encryption Tags Review

ⓘ Certain options have been disabled by default due to the combination of storage account performance, redundancy, and region.

Security

Configure security settings that impact your storage account.

Require secure transfer for REST API operations ⓘ

Allow enabling public access on containers ⓘ

Enable storage account key access ⓘ

Default to Azure Active Directory authorization in the Azure portal ⓘ

Minimum TLS version ⓘ

Figure 16. Creating a storage account in Azure

I also spent some time reading about best practices while using Storage accounts. Some of these practices are, ensuring that Shared Access Signature tokens are allowed only over HTTPS protocol, making sure that SAS tokens are not using overly permissive access policies, making sure that Azure Storage containers created to host static websites are not publicly accessible, Minimum TLS version is set to version 1.2 (Trend 2023). SAS token can be used to control how an individual accesses data in Azure, what kind of permissions they have, and the duration of validity of the token (Castillote 2019).

Similarly, another Azure resource we use is Cosmos DB. Cosmos DB is a globally distributed, low latency, multi-model database for managing large-scale data. This service is a PaaS service from Microsoft Azure. This is also called a serverless database, it is a highly available, and reliable database. Some benefits of Cosmos DB are that they are globally distributed, highly scalable schema-agnostic indexing which enables automatic indexing of data without schema and index management, and is multi-model which means it can store data in Key-Value pairs, document-based, Graph-based, etc. (IntelliPaat 2023). One thing I learned from personal experience is once the Azure resource group is deleted, it cannot be undone. Figure 17 shows different options users have while creating a Cosmos DB account.

[Home](#) > [Azure Cosmos DB](#) >

Create an Azure Cosmos DB account

Which API best suits your workload?

Azure Cosmos DB is a fully managed NoSQL and relational database service for building scalable, high performance applications. [Learn more](#)

To start, select the API to create a new account. The API selection cannot be changed after account creation.

<p>Azure Cosmos DB for NoSQL</p> <p>Azure Cosmos DB's core, or native API for working with documents. Supports fast, flexible development with familiar SQL query language and client libraries for .NET, JavaScript, Python, and Java.</p> <p>Create Learn more</p>	<p>Azure Cosmos DB for PostgreSQL</p> <p>Fully-managed relational database service for PostgreSQL with distributed query execution, powered by the Citus open source extension. Build new apps on single or multi-node clusters—with support for JSONB, geospatial, rich indexing, and high-performance scale-out.</p> <p>Create Learn more</p>	<p>Azure Cosmos DB for MongoDB</p> <p>Fully managed database service for apps written for MongoDB. Recommended if you have existing MongoDB workloads that you plan to migrate to Azure Cosmos DB.</p> <p>Create Learn more</p>
<p>Azure Cosmos DB for Apache Cassandra</p> <p>Fully managed Cassandra database service for apps written for Apache Cassandra. Recommended if you have existing Cassandra workloads that you plan to migrate to Azure Cosmos DB.</p> <p>Create Learn more</p>	<p>Azure Cosmos DB for Table</p> <p>Fully managed database service for apps written for Azure Table storage. Recommended if you have existing Azure Table storage workloads that you plan to migrate to Azure Cosmos DB.</p> <p>Create Learn more</p>	<p>Azure Cosmos DB for Apache Gremlin</p> <p>Fully managed graph database service using the Gremlin query language, based on Apache TinkerPop project. Recommended for new workloads that need to store relationships between data.</p> <p>Create Learn more</p>

Figure 17. Cosmos DB for different APIs

This has been an interesting week and I believe I have managed to work on the goal I set at the beginning of the week, and I have been able to learn more about Azure resources in detail. In addition to Azure resources, I have also learned best practices while using these resources, and I can use this knowledge during my work.

4 Discussion

In this chapter, I will discuss how I feel things have changed during these 8 weeks, how I have developed, and if I believe I have reached the goals that I set early in the thesis. In addition to that, I also had weekly goals, which I will reflect upon in this chapter.

As mentioned earlier, there were a couple of things that I wanted to improve during these 8 weeks periods. I wanted to gain a deeper understanding of our products, and the Microsoft ecosystem and improve my confidence and communication skills. I believe benchmarking my weekly situation has allowed me to improve vastly and track the progress I have made so far during these weeks.

When comparing knowledge of our product, I am confident that I have developed quite much, at the beginning there were some sectors where I wanted to improve, especially when it comes to dependency on the Microsoft ecosystem. During these weeks, I have been able to learn much about how things work, I can troubleshoot bigger and more complex problems as I have understood the products better. Lately, I have been able to take on bigger and more complex tickets without seeking much assistance from others and have been able to solve these problems independently. When I started every week, I had certain goals that I wanted to achieve that week, most of the weeks I was able to achieve those goals, and this allowed me to keep track of my development and progress.

When comparing my knowledge of the Microsoft ecosystem and products, I believe this has improved and developed much more than I had initially aimed for. I am very happy with this development. During these 8 weeks, I focused on different Microsoft products within Microsoft ecosystems like Azure, Azure AD, Azure Service accounts, Azure storage, databases, SharePoint, Teams, etc. This has allowed me to gain a deeper understanding of how our products work and allowed me to use knowledge of these products during my work to help provide better and optimal solutions to our partners. Learning about Microsoft products and ecosystems has also allowed me to see a clearer future and how I can develop my career with knowledge of these products. For example, during these weeks I have thought of getting some Azure certification, which can come in handy for me to advance in my career.

Initially, when I was taking complex tickets, I always hesitated if I would need to jump on a call with a partner as my confidence wasn't high and I struggled to communicate regarding the problem and communicate the solution on a call. Now, this has completely changed, my confidence has gotten higher, and I do not hesitate to jump on a call with a partner to discuss the issue and communicate a solution during the call. This has allowed me to take on complex tickets, which in turn helps me

with personal and technical development. This will be an important factor to progress in this career and take my career to a further level in the future.

During this period, I have created some internal Knowledge-based articles for our partners. Knowledge base articles are articles that contain a set of information (Document360 2023). This allows a partner to get a solution to some common problems easily without having to raise a ticket or deal with a support agent. Apart from KB articles, I have also created internal documentation for best practices and dos and don'ts of the Intranet. I have also developed my skill of understanding problems, which has allowed me to provide solutions to partners quickly and minimize the number of messages we need to have which saves both time and resources for partners and agents.

During the thesis period, I learned that it is very important to set weekly goals and do benchmarking on individual progress from time to time. This allows an individual to understand how effective the learning is, and if we have been able to make any progress or not. During these weeks, writing my thesis has allowed me to track my progress effectively, I now know what my level is when it comes to our products, MS products, solving problems, troubleshooting, and communication. Now, I can focus on developing the skills that I am lacking or look forward to what I want to learn or do next. Even though I was working in the company before I started writing my thesis, I had never compared what I learned or how I have developed as I was just focusing on learning new things but never tracking the progress, so for me, it was a little bit argue that I had developed or progressed. But now, after the thesis, I can easily argue that I have developed as I have been documenting my learnings and tracking my progress.

Before my thesis, I was not aware of how big Microsoft's ecosystem is, and how we can make a career out of this. Even though I had learned about Microsoft, and how big it is, I had never had a closer look. Now, while writing this thesis I put a lot of hours into learning about the Microsoft ecosystem, and its diversity and I learned about how I can use this knowledge to think of different potential tracks to choose from in the future. I also learned that having some Microsoft certifications will help individuals to further progress in their careers. Most importantly, I learned that as an individual we need to keep track of our progress and look back and reflect on what we have done and learned from time to time, it will allow us to grow as an individual and a professional. To me, this has been an important learning journey, not only in products but also from an individual perspective and understanding how I can grow further in my career.

I have been able to take advantage of job analysis in the sense that now I know at what level I am in my job. I have a better understanding of the skills I am lacking to further progress in my job, and I have a better understanding of my skills that I can leverage to work better in my job. I also have a

better understanding of what my long-term goal will be, and how I can leverage my knowledge to work towards my long-term goals.

To further develop my skills, I have planned to work on some Microsoft certifications like Azure cloud certification. I want to keep on working on some other skills, like coding which will allow me to take further steps in my career. Apart from that, I want to learn more about Microsoft products and develop further on these. I want to look into planning and consulting further in my career, so I want to work to develop to that level.

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