PONTIFICIA UNIVERSIDAD CATOLICA DE CHILE
ESCUELA DE INGENIERIA

A COMMUNITY FORUM FOR GOOGLE'S INTERNAL IT SUPPORT

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Trabajo de Título para optar al título de Ingeniero Civil Industrial, Diploma en Ingeniería Mecánica

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Santiago de Chile, (año 2020)

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Ingeniero Civil Industrial, Diploma en Ingeniería Mecánica

Santiago de Chile, (año **2020**)

To everyone that supported me when this was an idea and everyone that worked on the idea to make it happen.

ACKNOWLEDGMENTS

I'd like to thank my managers and mentors in Google, who always believed in me and guided me in the right direction to make this project a reality. I would also like to thank everyone that worked on this project, specifically Reetika Sud, Russ White, Keith Denny, Ben Koerbel, Eric Sheh, Alex Abfalter, Matthew Campbell, Anna Ilina, Gerard Barrachina, Matt Boulton, Alexander Özkan, Apoorva Manjunath, Ash Thomas, Raf Kedzierski, Shaun Craig, and others.

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ABSTRACT

This document describes the design and launch of a community forum to provide internal IT support in Google as an alternative to the current IT support channels (calls, chats, tickets, and desk visits). This forum is both a channel and a knowledge base. The forum is called YAQS and offers the advantage that support sessions are public, appearing on Google's internal search engine when employees search for solutions to their IT problems. This improves the self-help user journey preventing future support sessions. The forum's content accumulated more than 120,000 views after one month, with advertising only in Dublin and London.

I. TERMINOLOGY

YAQS: "Yet Another Question System." Internal question and answers site focusing on technical content. YAQS is Google's primary technical Question and Answer tool. Similar sites are StackOverflow, Quora, and Reddit.

TECHSTOP: Team that provides internal IT support to Google employees. It currently provides support through tickets, chats, calls, and in-person visits.

GOOGLERS: Google full-time employees.

MOMA: Google's internal search engine, where Googlers search for anything they may need, from a managers' email to solutions to their IT issues.

GOOGLER ENGAGEMENT (GE): Team within Corporate Engineering that makes technology work for all Googlers, so that they can deliver Google's mission. Techstop is part of GE.

TSFE: This is Techtop's main website, where Googlers land when they need IT help. An online entry point for Googlers seeking tech support.

SSA: Self-Service and automation team. A team within Techstop that focuses on innovations like this Pilot.

TAG: YAQS questions contain different tags that are added by the person asking. These tags describe the subject of the question and mandate to which team the question is diverted.

YODA: YAQS on-duty assignment. This was the name given to the YAQS shifts that Techs will do.

II. BACKGROUND AND CONTEXT

Google is a large multinational company founded in 1998. More than 115,000 employees (Googlers) work in different products such as the Google search engine, Youtube, Android, Google Cloud Products, G Suite, and Google Maps, among others. These employees utilize a wide variety of internal tools and systems to do their daily duties.

Corporate Engineering is an organization within Google with more than 6,000 employees responsible for inventing, building, implementing, and supporting all of Google's internal tools and systems. With 559 employees, Googler Engagement is responsible for providing internal IT support for these tools and systems.

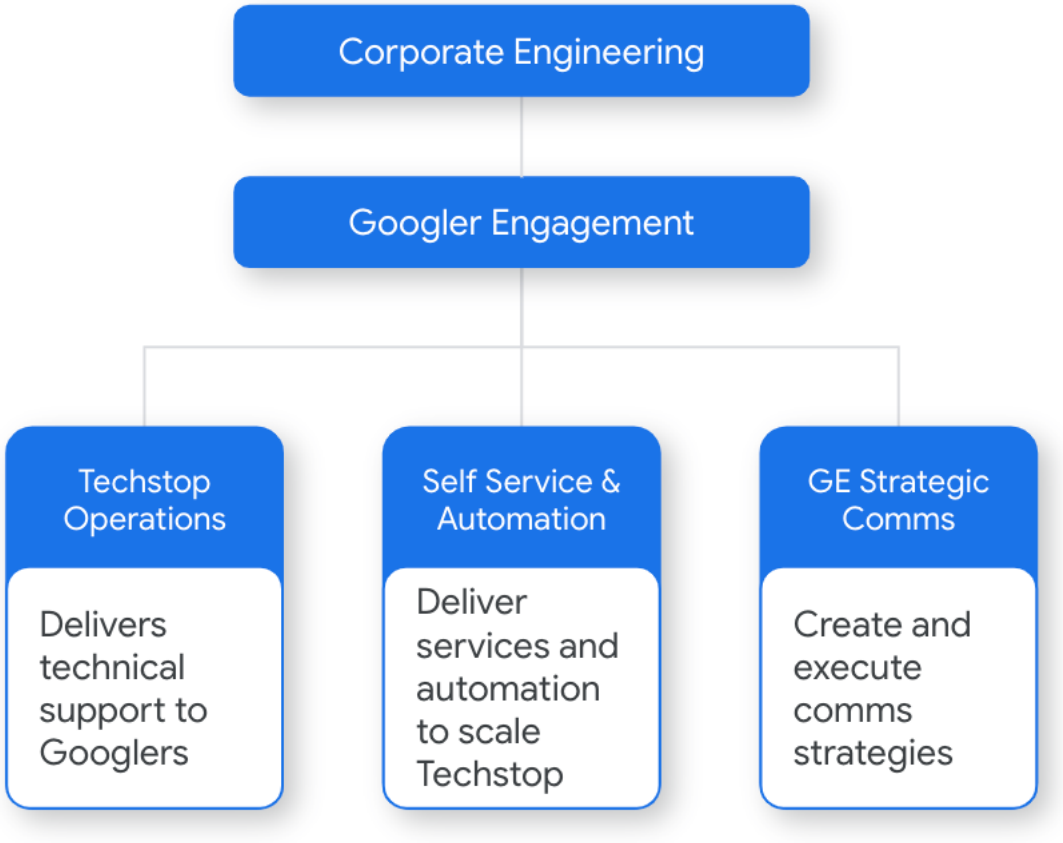

Figure 2.1: Corporate Engineering organizational chart

Figure 2.1 shows the three teams within Googler Engagement that are relevant for this project. Techstop Operations has 493 employees in offices across the globe that deliver technical support to Googlers. Self Service & Automation

(SSA) has 27 employees that deliver services and automation that help scale IT support as the company grows. GE Strategic Communications has six employees in charge of Googler Engagement's communications.

Techstop employees (Techs) have to provide internal IT support through traditional channels like tickets, chats, phone calls, and desk visits. The objective of this project was to automate simple questions that come in these channels by utilizing a new channel, a community questions and answers site called YAQS (Yet Another Question System). You can find a screenshot of YAQS in annex A. YAQS offers the advantage that questions and answers are public so that they can help other employees with the same question. This is not the case in other private channels.

The first stage of this project describes how a design thinking process led to the idea of incorporating YAQS as a new channel.

The second stage of the project was about estimating the project's impact and determining whether it helps continue Googlers Engagement's strategy. This was essential to obtain the leadership support needed to implement the project.

The third stage of the project was to plan and implement YAQS as a new channel. This was done in a Pilot using Techs from Dublin and London. Upper management determined that if the Pilot is successful, YAQS will become an official support channel globally.

The fourth chapter describes the results of the Pilot after one month of operations. The chapters also includes the conclusions drawn from these results, notes about the project's scope, and things to consider in the future.

The next chapters describe these stages in detail.

III. IDEATION

3.1 Design Thinking

When the student started working in Techstop one year ago, he followed a design thinking process (An introduction to Design Thinking PROCESS GUIDE, Stanford 2020) to determine different improvement opportunities for creating a project. Figure 3.1 is an internal diagram made in Google to describe the five stages of this process.

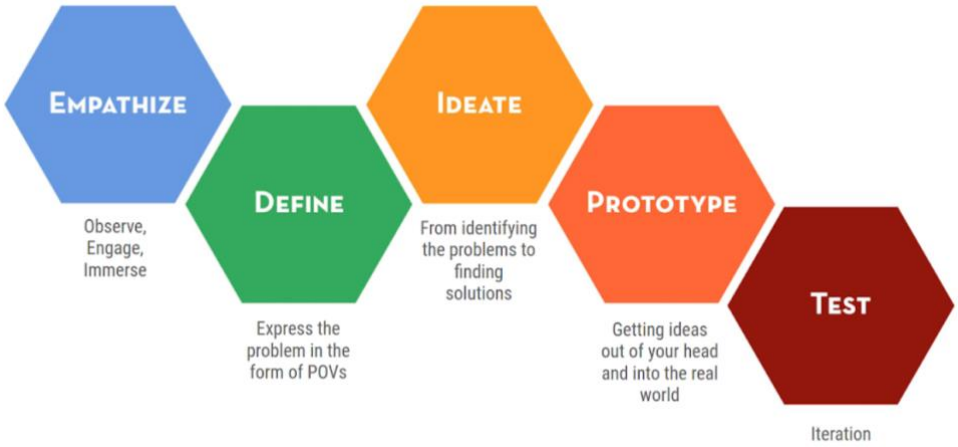

Figure 3.1: Design Thinking process

The student was in charge of conducting the whole Design Thinking process shown in Figure 3.1. The first three stages of this process, empathize, define, and ideate, culminated in the idea of utilizing a community questions and answers forum called YAQS for internal IT support. The last two stages, prototype and testing, are explained in the fifth chapter as part of the planning and implementation of the project. Figure 3.2 shows how the design thinking process was tailored for the project.

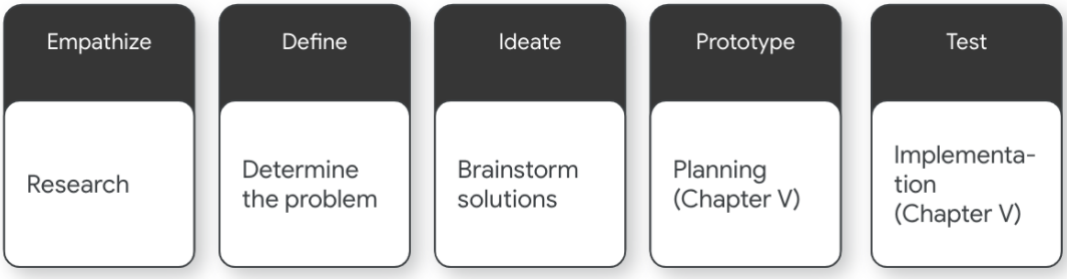

Figure 3.2: Tailored Design Thinking process

As shown in Figure 3.2, the first stage of the process, **empathize**, was all about research. The research was done doing interviews, observing employee behavior and reviewing internal Google documents. During this research, the student found the following insights relevant to this project;

- Most Google employees try to solve their IT problems on their own in a process called Self-Help (IT Research and User Experience, 2014).
- Only 4% of Googlers click in a Techstop article before contacting Techstop (Self-Service and Automation, 2019).
- Googlers go to MoMa (Google's internal search engine. You can find a screenshot in annex B) to find solutions to their IT problems before contacting Techstop (GE Machine Learning Operational Review, 2018).

The problem was that, when trying to solve their own IT problems, Google employees couldn't find the right resources to do so.

Because of these findings, during the second stage of the process, **define**, the student decided to work on improving the self-help process.

In the third stage of the process, **ideate**, the student went through brainstorming sessions to find a way to improve the self-help process. The outcome of these sessions was that YAQS (A question and answer site similar to Stackoverflow or Quora) could play an essential part in the self-help process. YAQS questions and answers appear in MoMa search results, so they could quickly reach Google employees searching for a problem. The more IT-related questions and answers Techstop has in YAQS, the better the search results in MoMa will be.

3.2 User Journey

Figure 3.3 describes the user journey Googlers follow when they have an IT issue. "Before TSFE" describes the journey Googlers go through when trying to solve the problem themselves, searching in MoMa. "TSFE" describes the journey Googlers have to make when they land on Techstop's website, meaning they need to contact Techstop through a traditional channel because the slef-help process didn't work.

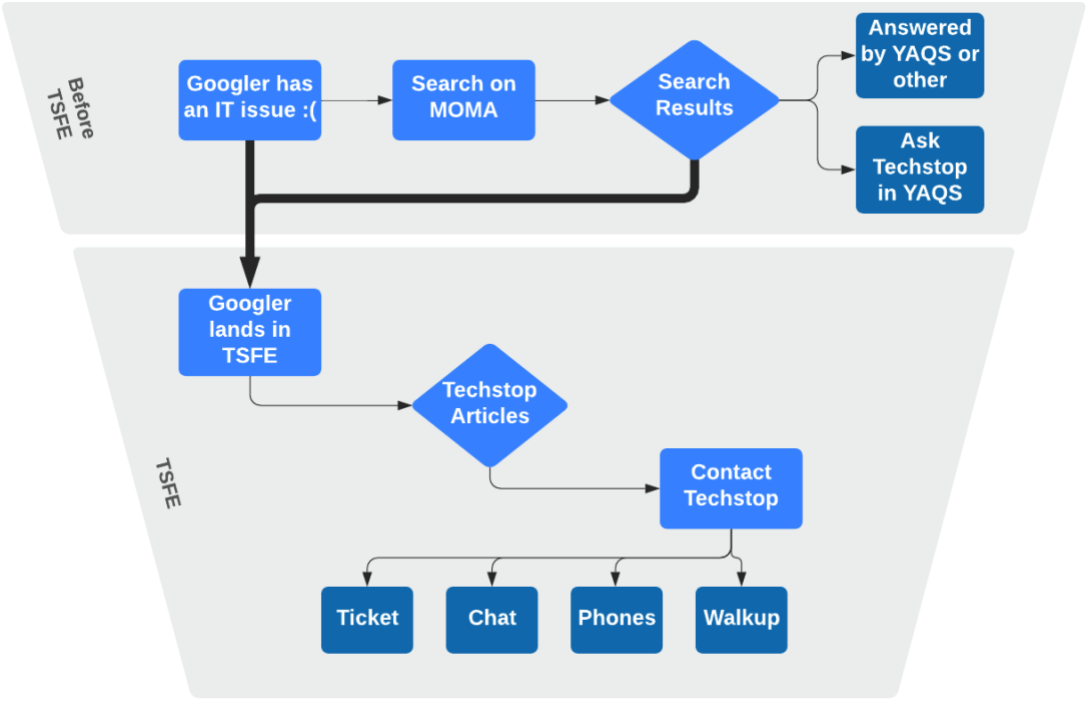

Figure 3.3: User Journey before this project

As emphasized by the bold arrows in Figure 1.4, most Google employees cannot solve the issue themselves in MoMa. This happens in part because there aren't enough YAQS questions and answers about IT issues.

Figure 3.4 described the expected user journey after implementing this project. The bold lines suggest that more Googlers found a solution to their problem through an existing YAQS question in MoMa search results. The yellow boxes show how this project will incorporate YAQS as an additional support channel in TSFE (Techstop's website).

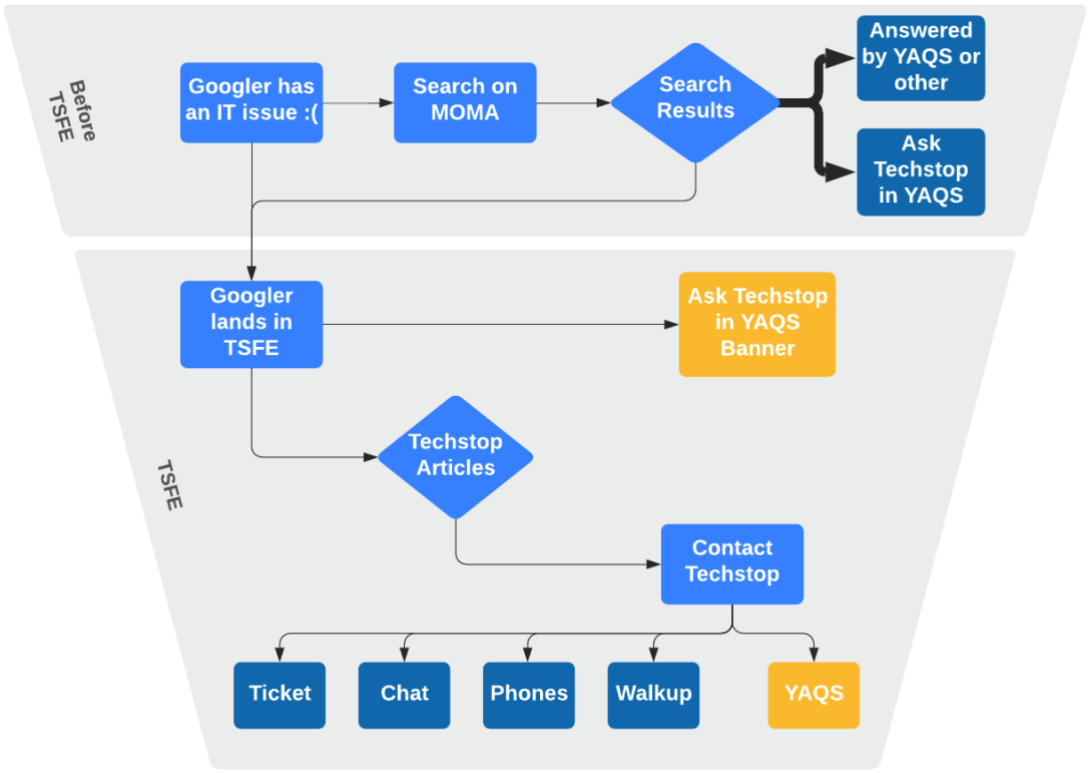

Figure 3.4: User Journey after this project

It's important to note that Googlers were already asking IT questions in YAQS before starting this Pilot, but the questions were being left unanswered as no one from Techstop was dedicating time to answer them.

Supporting the Techstop tag in YAQS will gradually create a public QA database, progressively improving Techstop-related search results in MoMa. This would prevent many techstop interactions as more Googlers end their user journey in the self-help stage, before contacting Techstop in TSFE.

IV. STARTUP

After having a clear understanding of the project's problem and solution, the next step was to obtain support from Googler Engagement's leadership. To receive this support, the student described how this project aligns with Googler Engagement's strategy and estimated it's potential impact.

4.1 Project alignment with Googler Engagement strategy

Techstop has a very positive image within Google because of its high-quality support, but it's a challenge for Techstop to maintain this quality with Google's rapid growth. Automating part of the current volume with YAQS will contribute to the scaling of Techstop.

The main goal of YAQS is "To enable Googlers to quickly get answers to Google-specific technical questions." A right YAQS answer can help a Googler very quickly as they appear in Moma search results. As mentioned before, it can be a prolonged process for Googlers to obtain an answer in a low priority ticket.

Another goal of YAQS is "For teams to reduce support time by avoiding answering the same question repeatedly." Answering simple questions is not the best use of our Tech's time, as they could focus on more essential tasks like helping really in-need Googlers, reporting and solving bugs, or developing new tools and products. With an active YAQS community, Techstop can free Tech's time, positioning it to scale our IT support while keeping our strategy and culture. Based on an analysis of 300 interactions, between 7% (lower-bound) and 20% (upper-bound) of chats and tickets are simple questions suitable for YAQS.

YAQS usage has been growing exponentially year after year (It has been duplicating yearly in the last three years), and MoMa already incentivizes Googlers to ask Techstop questions in YAQS. The student analysed 300 interactions between Gloogers and Techshop. The results show that between 7% (lower-bound) and 20% (upper-bound) of the chats and tickets Googler submit to the Techshop are simple questions suitable for YAQS. As stated before, Googlers' questions were being left unanswered because no one from Techstop was supporting YAQS. With this project Techstop engineers will focus on answering the questions in YAQS that have a "Techstop" tag.

Currently, Googlers are asking Techstop simple questions mostly through tickets and chats. Techstop's First Response objective for low priority tickets is 24 hours, but they often reply in 3 to 7 days. Because of this response delay, Googlers in a hurry may ask their simple question in a chat session. YAQS has the potential to answer questions within minutes, as any member of Techstop can answer it, unlike a private ticket assigned to a specific Tech. By answering questions through YAQS, the following Googler that experiences the same issue will have an answer without consuming time from someone in Techstop.

Automating repetitive questions will also free Techs' time so they can focus on more critical tasks such as reporting and fixing bugs or developing new products. With more Tech time available, Techstop will be in a better position to scale its support, hiring highly qualified and motivated Techs that can focus on meaningful tasks instead of answering simple questions. Googlers will also save a lot of time as the time to first response in YAQS is usually a couple of hours, compared to tickets that sometimes take days to get answered.

4.2 Impact Estimation

4.2.1 Methodology

To show stakeholders the potential impact that YAQS could have in preventing Techstop interactions, an impact factor (Vp) was estimated.

Not all IT support interactions are suitable for a community forum, as some required in-depth troubleshooting with extended communication between the Googler and the Tech. Thus, it was established in an agreement with management that only simple questions that need less than three replies to be solved, and don't contain any private user information, are suitable for YAQS.

Formula 1 estimates the percentage of the current volume of interactions that could be prevented having (A) active questions in YAQS;

$$V_p = min\,\{\frac{A * n}{T}, X\}$$

Vp = Volume prevented.
A = Number of active questions in YAQS.
n = Factor for how many Googlers are helped with each YAQS question.

T = Total volume for Techstop.
X = Percentage of current Techstop volume that is suitable for YAQS.

Notes:
-A static scenario where other variables don't change is being assumed.
-All of these variables are for a 1-month timespan.
-When calculating X, only simple questions appropriate for YAQS were considered.

As stated earlier (Section 4.1), the student obtained X by manually going through 300 tickets and seeing which ones could have been asked in YAQS. The result was that between 7% and 20% were suitable for YAQS.

The variable "n" was estimated by the student from other similar products;

- 2.2 average upvotes in Stack overflow mean each question helps at least 2.2 people on average.
- 68 (average views per question in YAQS) times an estimate (1/10) on the proportion that is helped by it, as not all views are a problem solved.

The average number of techstop interactions per month (T) in 2019 was 27400.

4.2.2 **Results**

Figure 1.2 shows the impact estimation results considering X = 14% (Obtained from manual sampling), n = 6.8 (1/10 of the average views per question) and T = 27400.

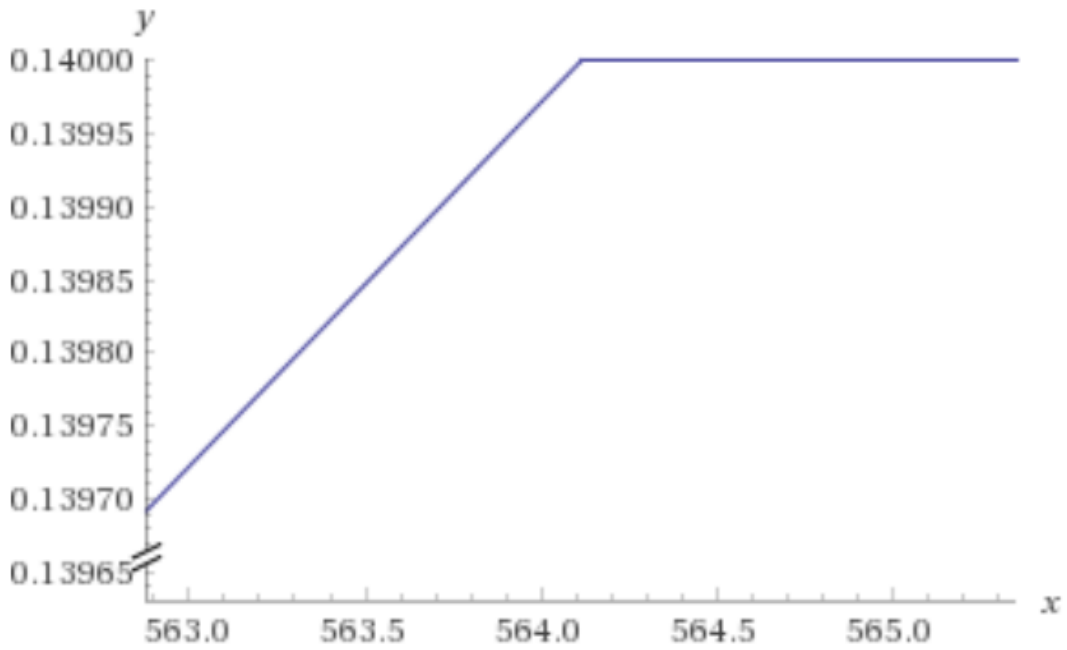

Figure 4.1: Impact Estimation Results

As shown in Figure 4.1, the estimate shows a linear increment in the volume diverted until the maximum possible volume is reached (14%) at 564 active questions.

V. PLANNING & IMPLEMENTATION

5.1 Project team building

In the early stages of the project, the student worked only with a Project Executive and a Senior Program Manager. Building a bigger team to develop the tasks was essential because of the different skills required. Most of the team members were provided by the Self-Service & Automation (SSA) team or contacted by me in a series of motivational presentations the student did to gather volunteers for the Pilot. The team was finally composed by:

- Project Executive (1): Main manager of the SSA team, ultimate decision-maker.
- Senior Program Manager (1): New Program Manager with previous experience in community support. A new hire that'll most likely manage YAQS if the Pilot is successful.
- Junior Program Manager (Me) (1): In charge of the project's general management, overviewing both high-level and low-level tasks.
- Operations Manager (1): Manager of the Dublin Techstop team.
- Data-focused Engineer (1): Engineer of the SSA team in charge of gathering data.
- Quality-focused Engineer (1): Engineer that will be in charge of designing quality-assurance methods for YAQS.
- Senior Engineer (1): Experienced Engineer of the SSA team that will help throughout the project.
- Tech volunteers (9): Techs assigned part of their day to answer questions in YAQS.

5.2 Defining project stages

In order to determine whether YAQS is a suitable support channel for Techstop, the student identified all the project's relevant aspects and broke them down into tangible activities or products to be developed and tracked. To do this with the limited resources available, the student prioritized activities that would be most beneficial for the project. This was done considering that YAQS had to meet Google quality standards and minimize the response time to fulfill the companies expectations. Figures 1.3 shows the initial breakdown of activities.

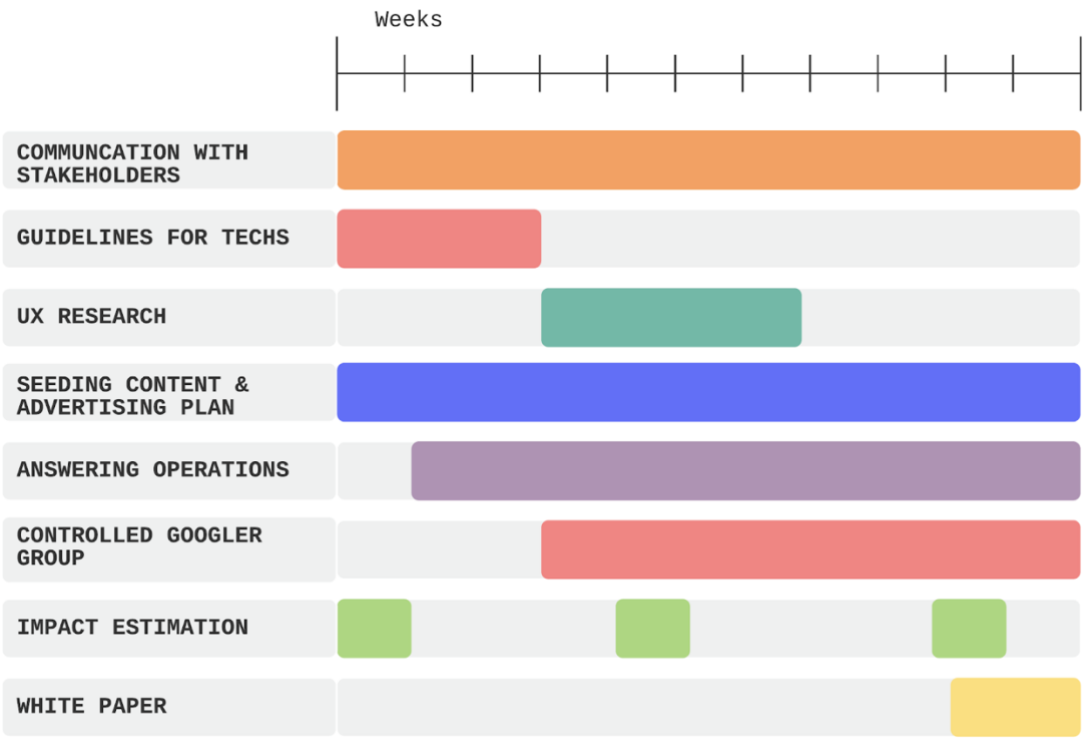

Figure 5.1: Initial Project Breakdown

As shown in Figure 5.1, the main stages for developing this project were:

- Communication with stakeholders: Communication strategy for each stakeholders of the pilot. Described in section 5.3.
- Guidelines for Techs: Clear instructions for Techs on how to handle a YAQS shift and the quality standards needed. Described in section 5.4.
- UX Research: Develop a UX research study exclusively to obtain insights for this project. Described in section 5.5
- Seeding content & Advertising plan: Artificially planting strategic questions in YAQS, described in section 5.6, and advertising YAQS as a new Techstop channel, section 5.7.
- Answering Operations: Defining how Techstop will answer YAQS questions. Described in section 5.4.
- Controlled Googler group: Start advertising YAQS to Googlers in Dublin and London and start answering incoming questions. Described in section 5.8.
- Impact estimation: Described in section 4.2.

- White paper: An internal white paper will be created at the end of the pilot to showcase the project to other Google teams.

It is said that change is inevitable during a project, and this was no exception. After starting the pilot, new aspects were detected and the initial plan went through several iterations modifying the activities and products in order to fulfill the pilots´ objectives. Figure 5.2 shows the final Project Breakdown.

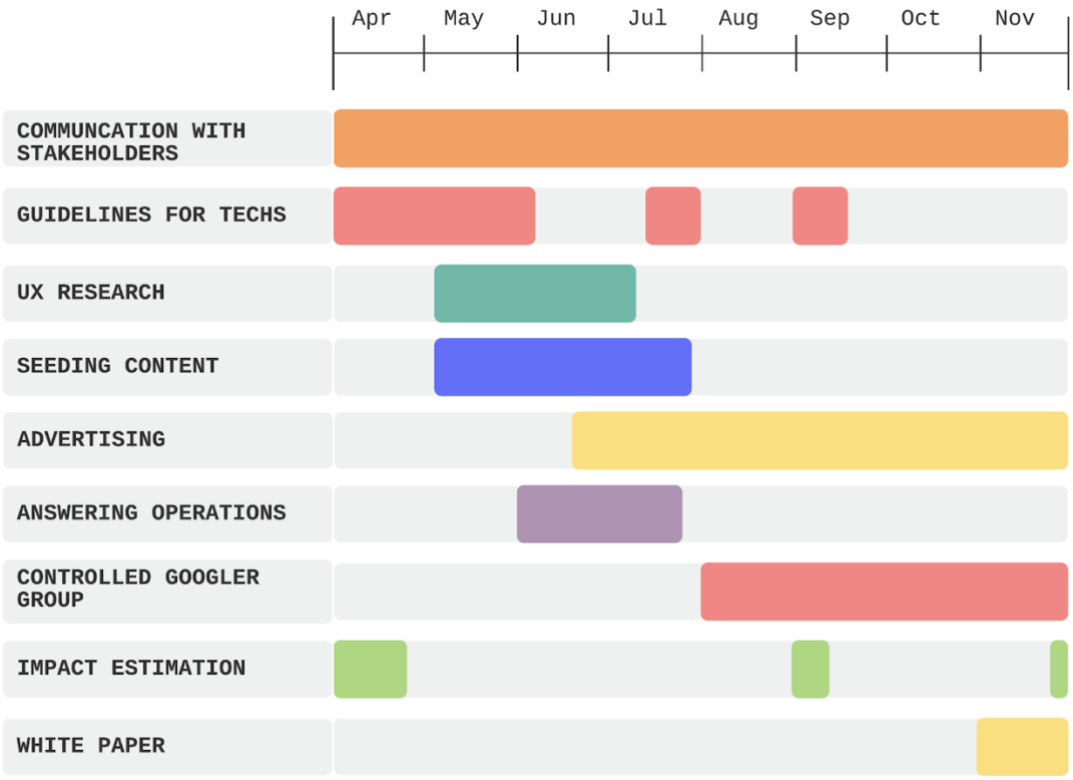

Figure 5.2: Project Breakdown with changes

As shown in Figure 5.2, the project had to adapt by doing additional iterations on the guidelines for techs, as new aspects were discovered during implementation. Seeding content and advertising were separated into different stages because of their complexity. Answering operations was finished ahead of time, and hence it's due date shortened.

5.3 Stakeholders & communications management approach

Because Google is such a big and complex company, this project has many different stakeholders, like the Techstop teams in Dublin and London that

will answer the questions, the SSA team that manages the self-help user journey, GE upper management, and the developers of YAQS and MoMa, among others. It's crucial to identify these stakeholders and communicate with them to create a mutually-beneficial relationship. Different stakeholders had different interests in the project, so the team developed a strategy to communicate with each one. The stakeholders and communication plans are described below:

- Googler Engagement management, Self-Help & Automation management, and Dublin & London management: These stakeholders have a deep interest in the project's outcome. They will determine whether the outcome is positive or not. The team decided to communicate with them through weekly updates summarizing the Pilot's progress and achievements, including all relevant data.
- YAQS team (1 Engineer): The team identified the Engineer in charge of the development of YAQS. Meetings were established to present this project to them as Techstop can become the biggest user of YAQS after this pilot. Constant communication was established with this stakeholder whenever the team needed to answer a question about YAQS.
- Specialist teams that already use YAQS (4 Teams): These teams support products relevant to Techstop. At the start of this project, the team contacted these teams to obtain insights on their experience using YAQS.
- Techs involved in the Pilot (9 Techs): Tech volunteers provide some of the most valuable feedback for this project's success. Weekly team meetings and a chat room were established for communications within the YAQS team.
- GE Comms strategy (1 Googler): This team manages all communications for Googler Engagement. This team was contacted to write and format the project's advertising.

5.4 Operations Plan

5.4.1 Estimating demand and Tech time needed

To launch the pilot it was essential to determine how Techstop will start answering YAQS questions. To do this, the student estimated the Tech time needed to cover the demand generated by answering questions through YAQS. With the approval of their managers Techstop engineerers could volunteer to work in this pilot. This volunteers would give up some of their ticket shifts to work on YAQS shifts instead.

To request Tech time from Dublin & London managers, it was necessary to know the expected number of daily incoming questions. The student estimated this demand before calculating the Tech time needed to answer YAQS questions.

As many IT support questions in YAQS didn't have the "Techstop" tag, the student first analyzed techstop-relevant tags, estimating which percentage of the questions with these tags were about IT issues. Figure 5.3 shows the results of this investigation ("sum" is the total volume for each tag, and "weighted sum" is the volume of IT support questions).

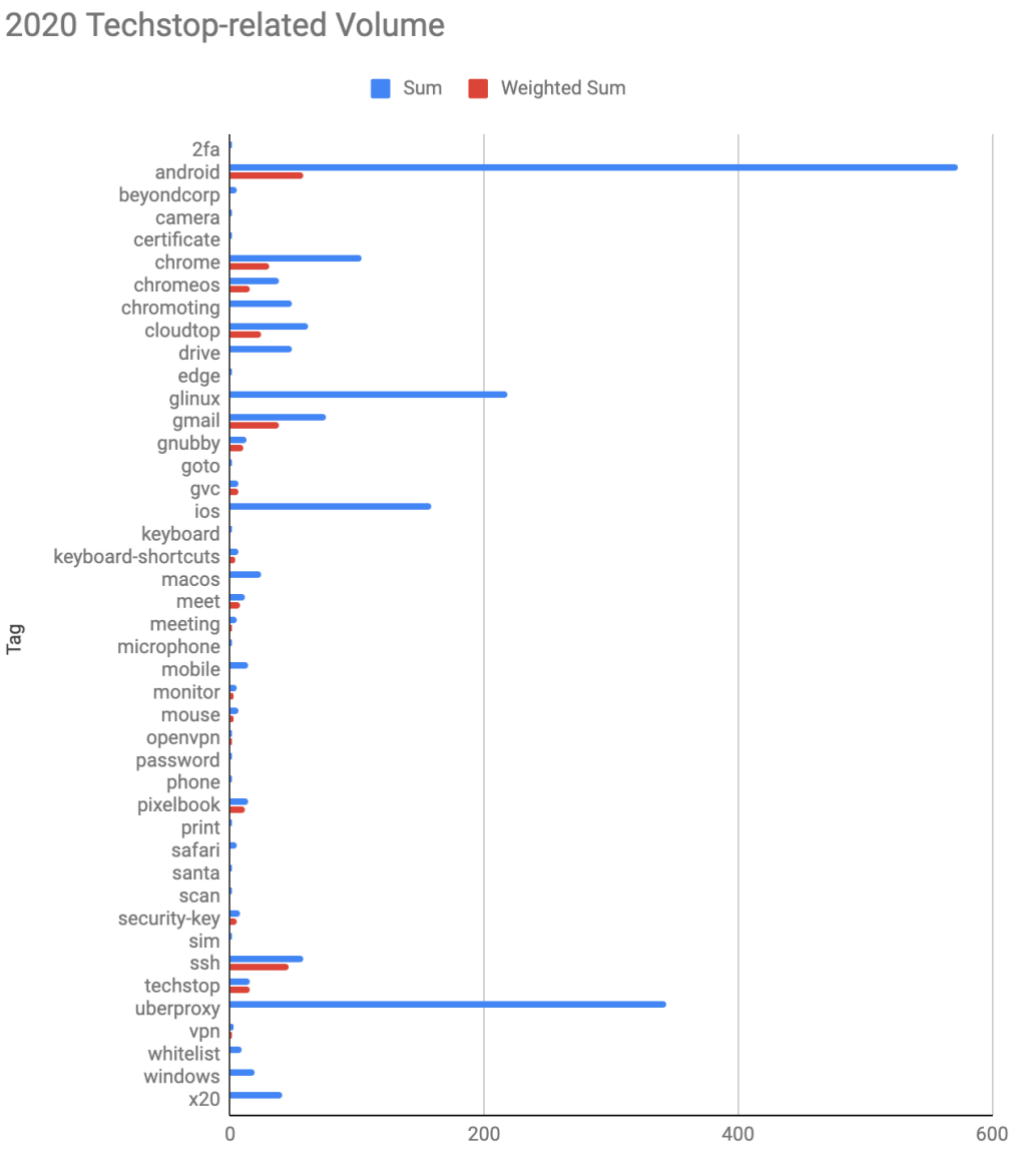

Figure 5.3: Techstop-relevant tag analysis

As shown in figure 5.3, some tags have a very low expected demand (i.e. scan), and some of them very high demand (i.e. android). For the estimation, the project only considered the tags where more than 70% of their issues are relevant to Techstop. For example, the tag “santa” was discarded because of its low relevance.

Once the techstop-relevant tag analysis was done, the demand from each relevant tag was aggregated to obtain the monthly estimated demand. This monthly demand is shown in Figure 5.4 below.

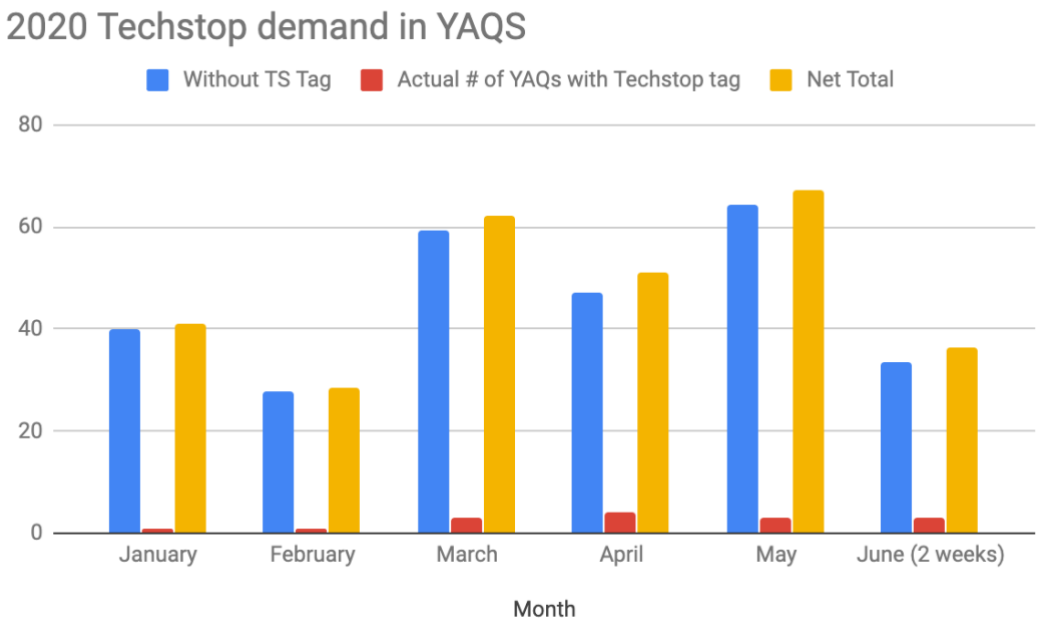

Figure 5.4: Estimated Demand

As shown in figure 5.4, the demand for March, April, and May was between 40 and 70 questions per month. This demand shows a permanent increase, which the team suspects is due to COVID.

After estimating the demand, the student used the average time it takes a Tech to resolve a ticket to estimate the weekly Tech time needed for the Pilot. The low priority ticket time was considered as it’s surrent preferred way to answer simple questions.

Table 5.1: Tech time needed (Hours per week)

	High end	**Low end**
Time estimated per YAQS question	1.8	0.5
Avg Weekly Questions	13.0	13.0
Assuming 15% increase due to advertising	15.0	15.0
Tech time needed per week for answering operations	26.4	8.0
Time for sharing feedback and learning	4.0	1.2
Total tech time required per week (Hours)	30.3	9.2

As a result of this analysis, it was agreed with Dublin & London management to provide 15 weekly hours between the nine volunteering Techs.

5.4.2 Guidelines for Techs

Another essential issue was to create guidelines for the new YAQS shift and explain it to the volunteers. The student developed quality standards for the answers that Techs would give to Googlers to maintain the quality of support provided in other channels.

All Techstop support channels have a document called Standard Operating Procedures, which describes the best practices of the channel's operations. This document's content is essential because it explains everything about an operating channel. It explains the basic use, for example what each button of an applications' user interface does, and more complex issues as to what actions each Tech should take during a shift. This document did not exist for the use of YAQS by the Techs, so part of the students work was to create it. The main sections of this document include the roles and responsibilities of each Techstop employee, how to handle a new YAQS question, and what is the objective from the time to first response to a new question. This document is in Annex C.

Despite the relevance of the Standard Operating Procedures document, because its length, Techs rarely read it. Because of this, the student had to analyze the document, decide which were the most relevant items and created a one-pager

document. This summary contains links to the tools needed for each shift (i.e. spreadsheets to register their work) and an overview of the most important tasks to do in a shift. These tasks are answering new questions, reviewing old questions that came back with more information, searching for questions without the Techstop tag, and seeding more questions. These tasks are organized by priority, so a Tech should only start the next task if the current one is finished. You can find this in Annex D.

5.4.3 Quality Management

Googlers have a very positive opinion about Techstop (Techstop brand perception survey, 2019), and this Pilot couldn't risk that. Because YAQS answers are public, the team has to strive to make them of the best quality. Quality includes the technical content of the answer and soft skills like having appropriate empathy with the Googler experiencing the issue and assertive language levels.

The team's quality-focused engineer and a volunteer specialized in UX writing developed a document to show Techs what constitutes a good YAQS answer. The document has the following 4 main sections;

- Be human: Empathy in the language.
- Be useful: Usefulness of the proposed answer.
- Be simple: Readability of the answer.
- Be clear: Assertiveness of the answer.

The document, "How to Write Helpful Community Answers," is in Annex E.

5.5 UX research study

Thanks to the SSA team's resources (The team is entitled to request UX studies whenever they need them), the team could get a UX study done exclusively to get insights that would help our Pilot. During the build-up for the study, the student had several meetings to explain to the UX team what the team was looking for, which was a deeper insight on the behavior of YAQS users (i.e., What is the profile of YAQS users, what triggers the creation of a question and what are their expectations once it's created). The UX team interviewed more than a dozen people and got the following results:

- The majority of users said they would only end up on YAQS, Groups, or other specific resources via a MoMa search. They would never got directly to these specific resources.
- YAQS is more prominent among the engineering community, as they use it a lot for engineering questions.
- Engineering questions are a lot more prominent than sales or finance questions.
- People searching on MoMa don't really pay attention to what tool provides the results.

With thess findings the UX team suggested that the responsiveness of YAQS could be improved with dedicated shifts as people don't know when their questions will be answered. This finding corroborated our intend to work with Techs on specific shifts for answering YAQS questions.

5.6 Seeding strategic questions

YAQS engineering suggested that to seed common questions and answers before beginning to use YAQS as a support channel was a good approach in order to so that appear in MoMa search results. By doing this Googlers will find IT results in MoMa creating awareness that they are available in YAQS. Following this advice, the team seeded 200 questions with the volunteers' help. These questions came from the following sources:

5.6.1 Top Techstop-related MOMA queries (38 seeded questions)

One of the team's engineers analyzed MoMa log data to capture the top techstop-related MoMa queries being searched by Googlers. This was incredibly useful as the team could seed questions directly targeting what users were searching for. As the queries were random words (i.e., ssh laptop to cloudtop), the student turned them into a question format (i.e., How can I ssh from my laptop to my cloudtop?).

5.6.2 Brainstorming or real tickets (23 seeded questions)

The team volunteers seeded questions that they thought would be useful or that were asked in a different channel (i.e., ticket or a chat session) and would be suitable for YAQS. This was based in the frequency and type of question.

5.6.3 2020 low priority tickets solved in one touch (157 seeded questions)

One of our volunteers specializing in Data Science obtained all the 2020 tickets that were low priority and solved in only one reply by the Tech. It was considered that these tickets were simple issues or questions reproducible in YAQS.

5.7 Advertising Plan

Because the team was mostly settled in Dublin it was decided to begin the advertisement in this city. If the Pilot proves to be a success, YAQS would be established as an official channel for Techstop IT support and advertised globally. The Communications Strategy team worked with this project team designing the pilot campaign. The following advertisement methods were chosen because they were low cost and had the higher possible impact:

5.7.1 Dublin Newsletter

This newsletter only goes out to Dublin employees, so the team contacted the owners to place an ad in it. Figure 5.5 shows this advertisement.

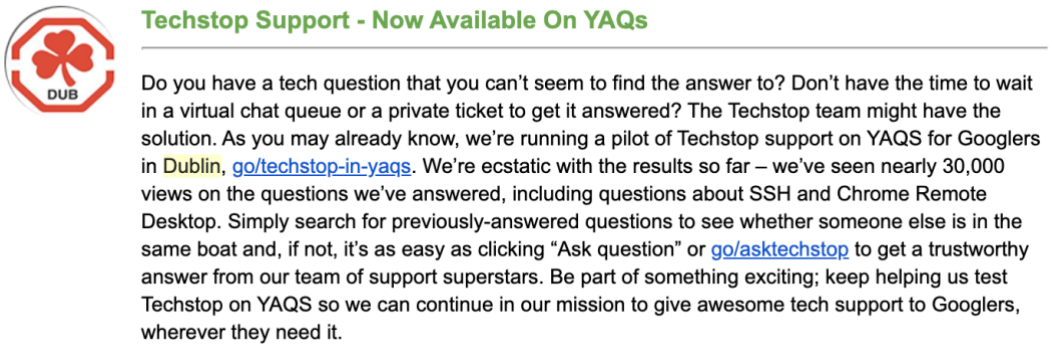

Figure 5.5: Newsletter Ad

5.7.2 MOMA Gadget

When Googlers search for "Techstop" in MOMA, a box appears with the most relevant Techstop information. A section in this box advertising YAQS as a new way to get help was added. This section is only visible for Dublin Googlers. Figure 5.6 shows MoMa gadget.

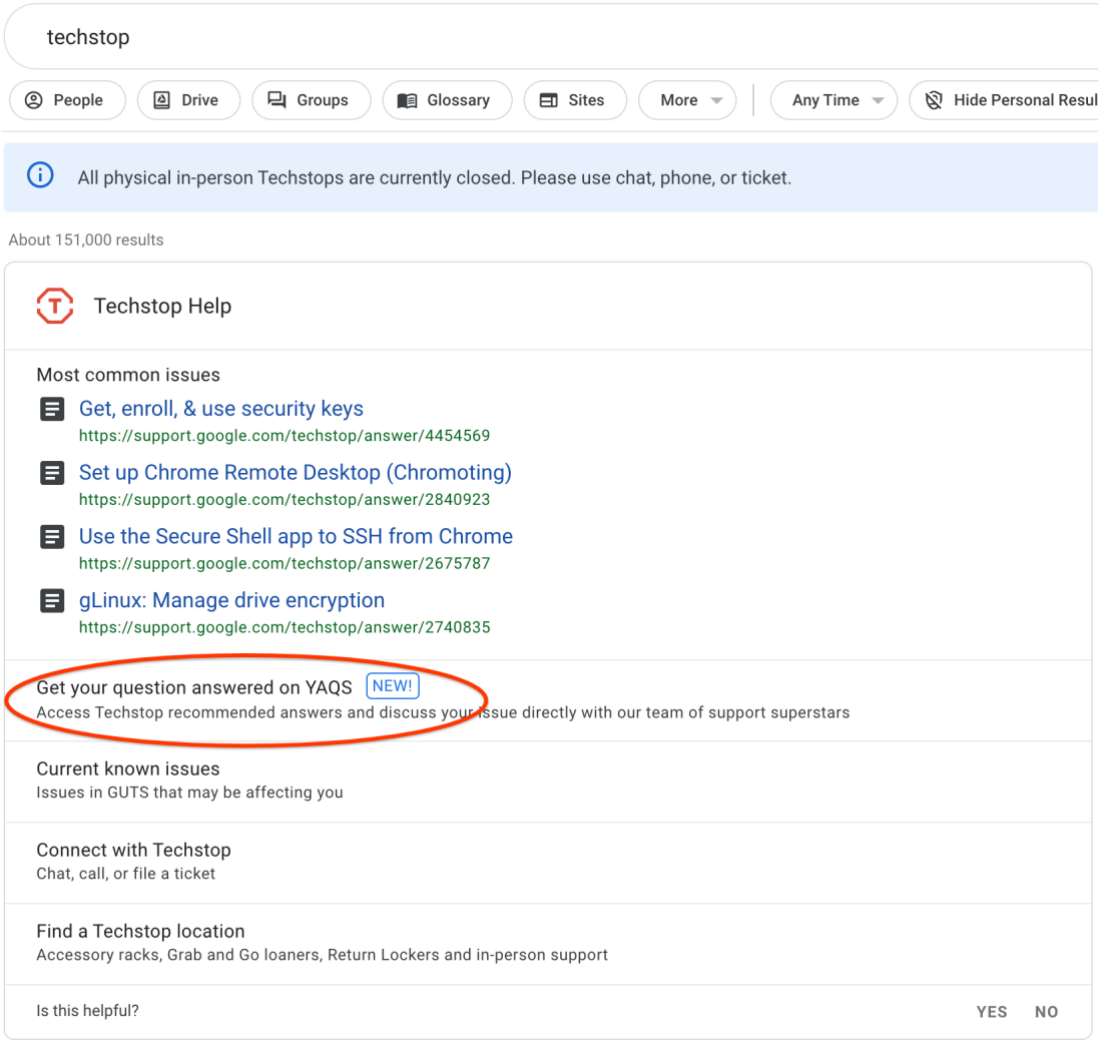

Figure 5.6: MOMA Gadget

5.8 Implementation

Because of COVID, all Googlers started working from home. This meant that they could not ask questions in person to their colleagues increasing the use of YAQS, in perfect timing for our Pilot. Because of this the Pilot was given priority by the Team within Corporate Engineering and by the Self-Service and automation team. This allowed the project to count with more engineering resources.

As Googlers work from home, there was an increase in questions about Secure Shell and Chrome Remote Desktop (two ways of connecting to a workstation in the office remotely). Based on this need, the seeding strategy changed, and more questions about these subjects were seeded.

While analyzing the questions with more views, the student noticed that a question about a *known issue* (i.e. when a whole building has a networking outage or an internal HR website stops working) could have tens of thousands of views. This happens because the issue might be affecting many people who do not know what is going on. In order to optimize the response on these questions, when the team learned about a *known issue* relevant to Techstop an artificial YAQS questions with its respective answer was added to the system.

All the data from the YAQS shifts (which were named "Yoda shifts") was recorded in a Master spreadsheet. Techs entered the work they did, such as answering a question or seeding a new question. They also had to register any relevant information on the question itself, for example whether it had a privacy issue or if a ticket had to be created for additional troubleshooting. These allowed to understand what types of question were being asked and how Techs were using their time.

From the YAQS database, the team collected relevant data such as the number of questions coming in, the number of views each question had, the deflection rate, and the time to first response of each question. This Pilot could not obtain access to who viewed each question, as this needs a long privacy clearance process. As a consequence, the team could obtain the deflection rates for Googlers asking the question but not for views (this is explained in details in the next chapter). The team is working on getting this clearance as soon as possible.

Another lesson learnt from the implementation of this pilot, was that a Tech might miss a shift, or part of a shift, because of different reasons (i.e., there is a long wait time on phone calls, so their manager asks them to abandon the YAQS shift to help with phone calls), so they had to constantly update the scheduling sheet to keep track of the real amount of hours spent on YAQS shifts each week. This allowed the team to know how many questions per hour can be answered.

VI. RESULTS & CONCLUSIONS

6.1 Pilot Results

This section describes the outcome of the Pilot after one month of operations. The outcome is measured in quantitative data so that Techstop can make informed decisions on the success and future of YAQS. Figure 6.1 shows the number of incoming questions posted in YAQS.

6.1.1 Number of incoming questions

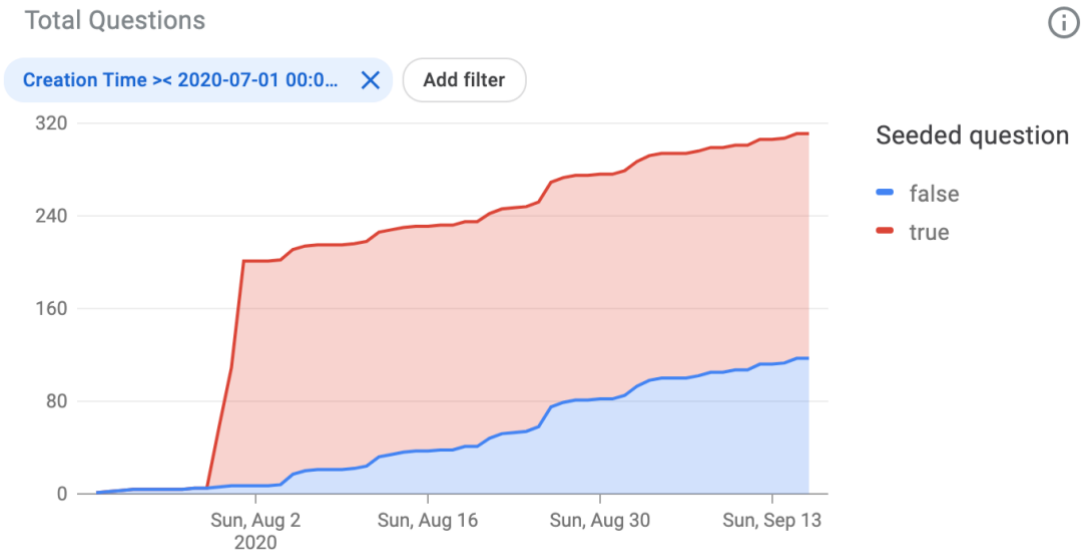

Figure 6.1: Total Questions

As shown in Figure 6.1, YAQS saw a steady increase in the total number of questions under the Techstop tag, which means that there is a mass of daily active users that are growing. The increase is mostly driven by non-seeded questions, suggesting that these have a bigger impact on views than seeded questions. This proved that there is a demand for IT support in YAQS, which is what the project's management and stakeholders expected. This also proves that Googlers are able to find Techstop questions in YAQS through their MoMa searches. By doing so, the Tech time used to respond easy questions will diminished, as also will the Googlers time "lost" in an IT issue.

Figure 6.2 shows the new questions asked by week

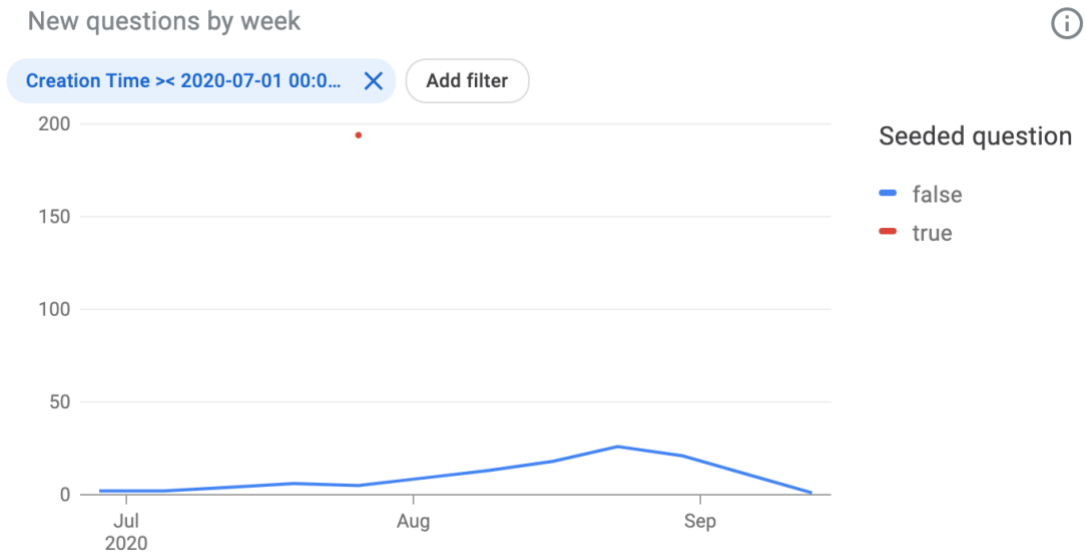

Figure 6.2: New Questions by week

As it can be seen in Figure 6.2, the number of new incoming questions had a slow increase thorught the pilot. The advertising didn't have much effect as the Dublin Googler population is very small. It's important to note that even a slow number of incoming questions can drive large amounts of views on these questions.

6.1.2 **Views on questions**

Figure 6.3 shows the view count on questions.

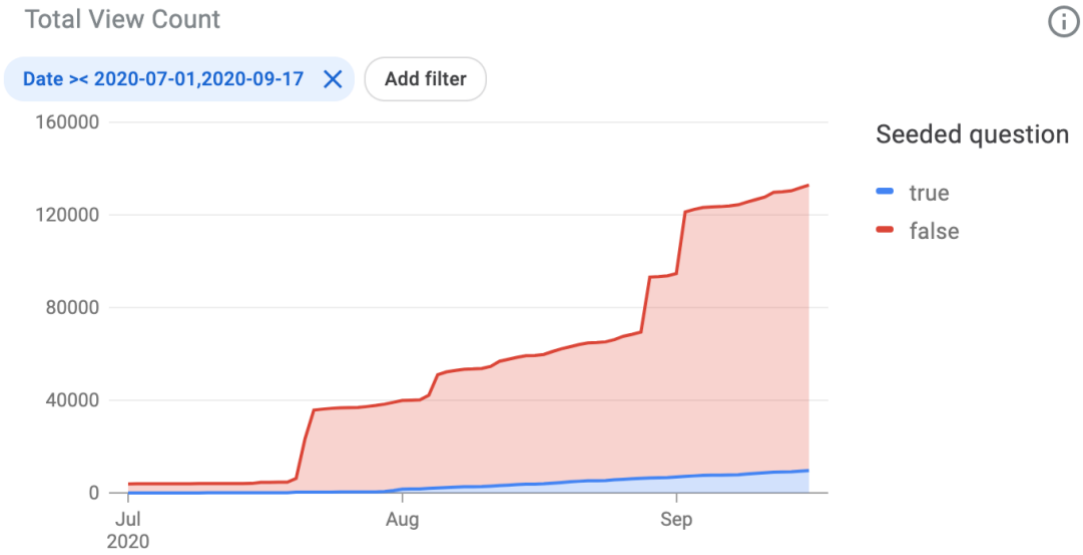

Figure 6.3: Total View Count

As presented in figure 6.3, the Pilot accumulated more than 123.000 views on non-seeded questions and 9.600 views on seeded questions by mid-September. This far surpassed the initial measurements of success, as the Self-Service and automation team had an OKR about reaching 17000 views after 3 months. The total view count was almost nine times higher in only the first month. This means that by using YAQS the Techs responded only one time a question that helped several Googlers.

Figure 6.4 shows the new views on questions by week.

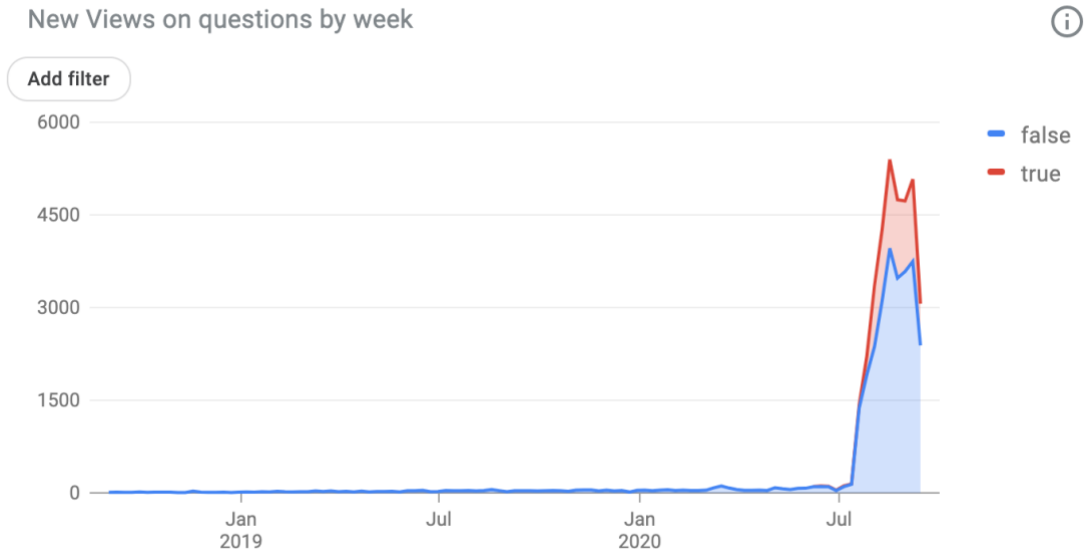

Figure 6.4: New views per week - weekly average

As shown in Figure 6.4, there were consistently 4000-5000 new views observed on IT questions by week, around 3500 for non-seeded questions and 1500 for seeded questions.

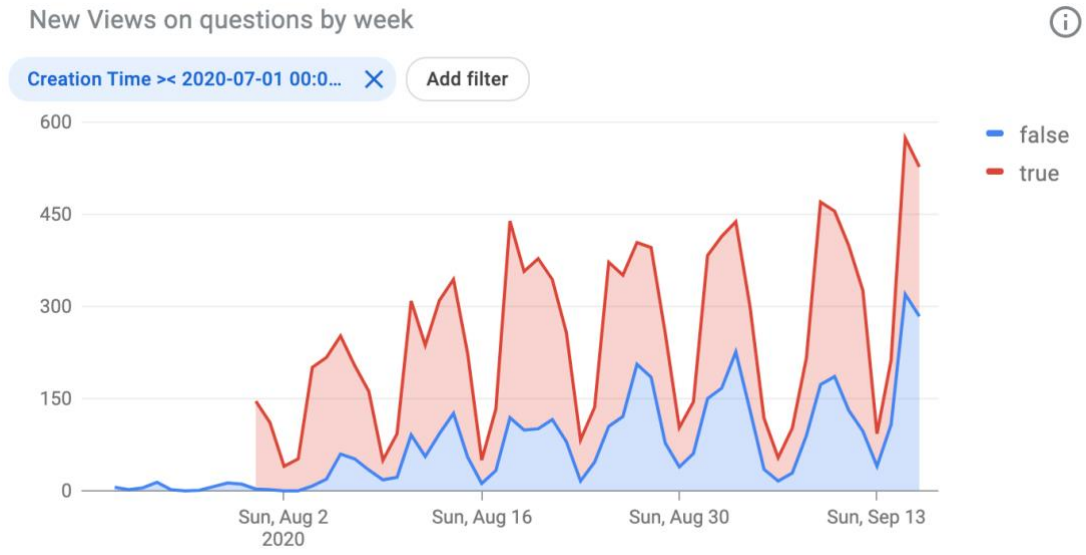

Figure 6.5: New views by day

Figure 6.5 confirms what was seen previously, a steady increase in the new views by day, which proves that there is a demand for support in YAQS. This is driven mostly by views on non-seeded questions, but seeded questions provide

a significant amount of views, around 200 every day, which now represent more than 50% of total views.

6.1.3 Time to first response

Figure 6.6 shows the time to first response of YAQS questions

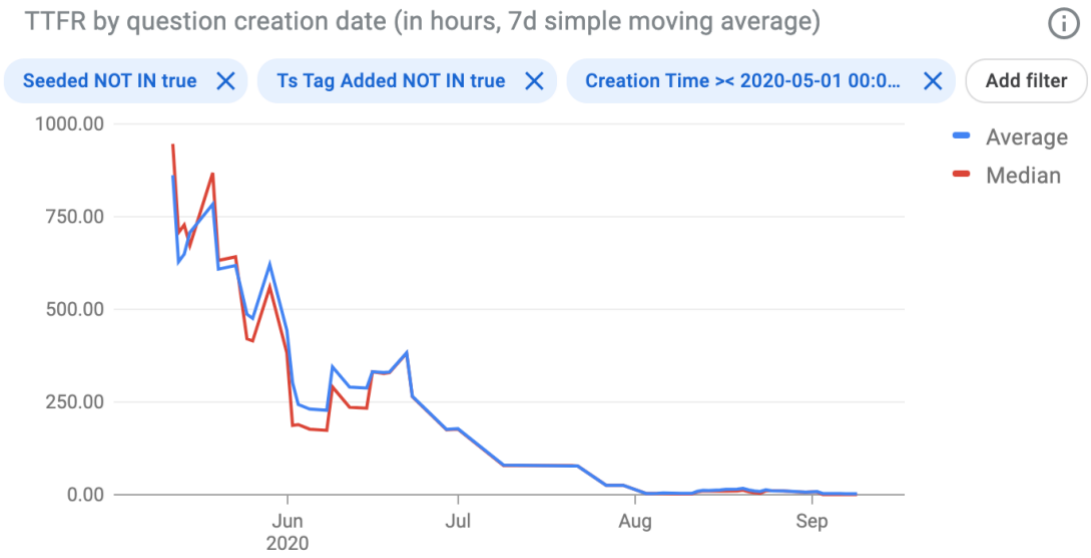

Figure 6.6: Time to first response

Figure 6.6 shows how the time for first response was brought down from almost 1000 hours before the Pilot started to only 3-10 hours. These results prove that YAQS provides faster answers than tickets, saving Googler time, as described in section 4.1.2.

6.1.4 Deflection rate

Deflection rate is the rate of Googlers who do not create a ticket after asking a question in YAQS. Figure 6.7 shows the deflection rate.

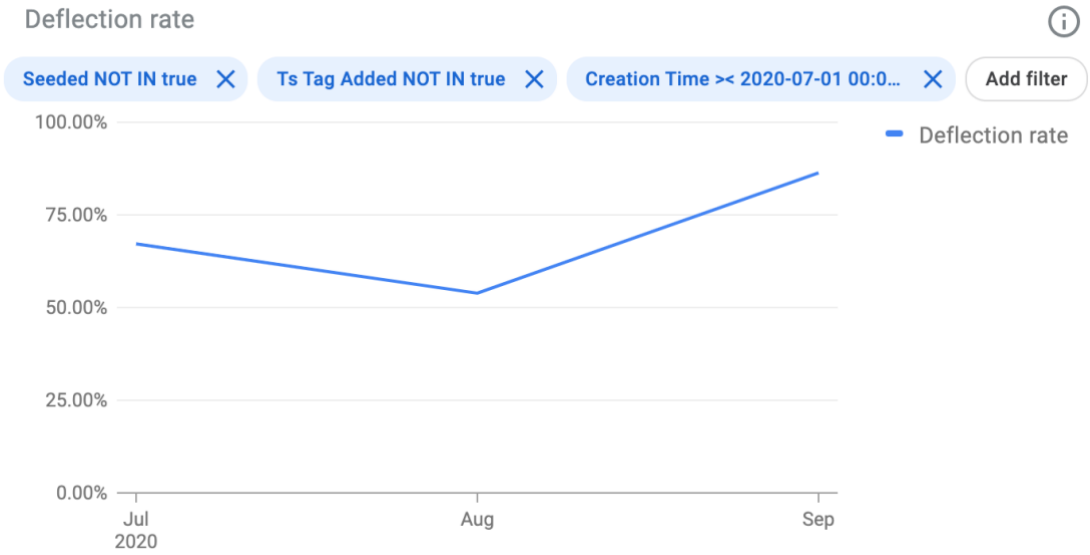

Figure 6.7: Deflection rate

Figure 6.7 show that there was a slight increase in the deflection rate from August to September. Because the number of incoming questions during the pilot is low, the management team considered that this number's variance is too big to make any conclusions.

The team expects to get more confident numbers once they can measure the deflection rate of views. As the amount of views is more than ten times larger than the number of incoming questions, this deflection rate variance should be lower. As explained in section 5.8, this is blocked because of a privacy clearance.

6.2 Conclusions

As the results show, the Pilot has proven that YAQS can provide an opportunity by allowing a large amount of views on content, utilizing only a small amount of Tech resources. Techstop is considering launching advertising for YAQS globally sooner than expected, so it looks like YAQS will be an official IT support channel for Techstop very soon. The total number of views, more than 120000 in the first month, surpassed Self-Service and Automation management's (Main stakeholder) goal for 3 months. The time to first response has been steadily under 10 hours, surpassing the goal of 24 hours that tickets have. This success is

explained by a great team's work, the organization's support of the project, and perfect timing.

This Pilot has proven that it's possible to provide IT support through an open QA forum. This forum is more efficient than other channels as each interaction can help hundreds or thousands of users, instead of just helping the user that created the support session. This Pilot also showed us that a community QA forum is not only a support channel, but it's also a knowledge base, and it requires quality management.

With a database of around 300 questions, Techstop questions in YAQS are getting 5000 weekly views constantly. Techstop still needs to determine the deflection rate of views once the appropriate log access is granted. This is the only thing holding management from making YAQS an official channel, as all their other goals have been achieved by the project.

6.3 Project scope and things to consider in the future

Even though this project answered YAQS questions from Googlers all over the globe, implementing global advertising will pose new challenges. The incoming demand has been low so far, but global advertising and word of mouth could increase the demand very quickly, so the team should develop a scaling plan.

Something to understand is that an increase in demand could hurt the current time to response metric, but having Techs do YAQS shifts in different timezones of the world should mitigate this as shifts would be more frequent.

Another thing that needs to be addressed is that YAQS is mostly used between Google's engineering community, but it's not popular among Finance, Sales, or Human Resources, among others. In the future, a strategy should be developed to create awareness about YAQS among non-engineering Googlers.

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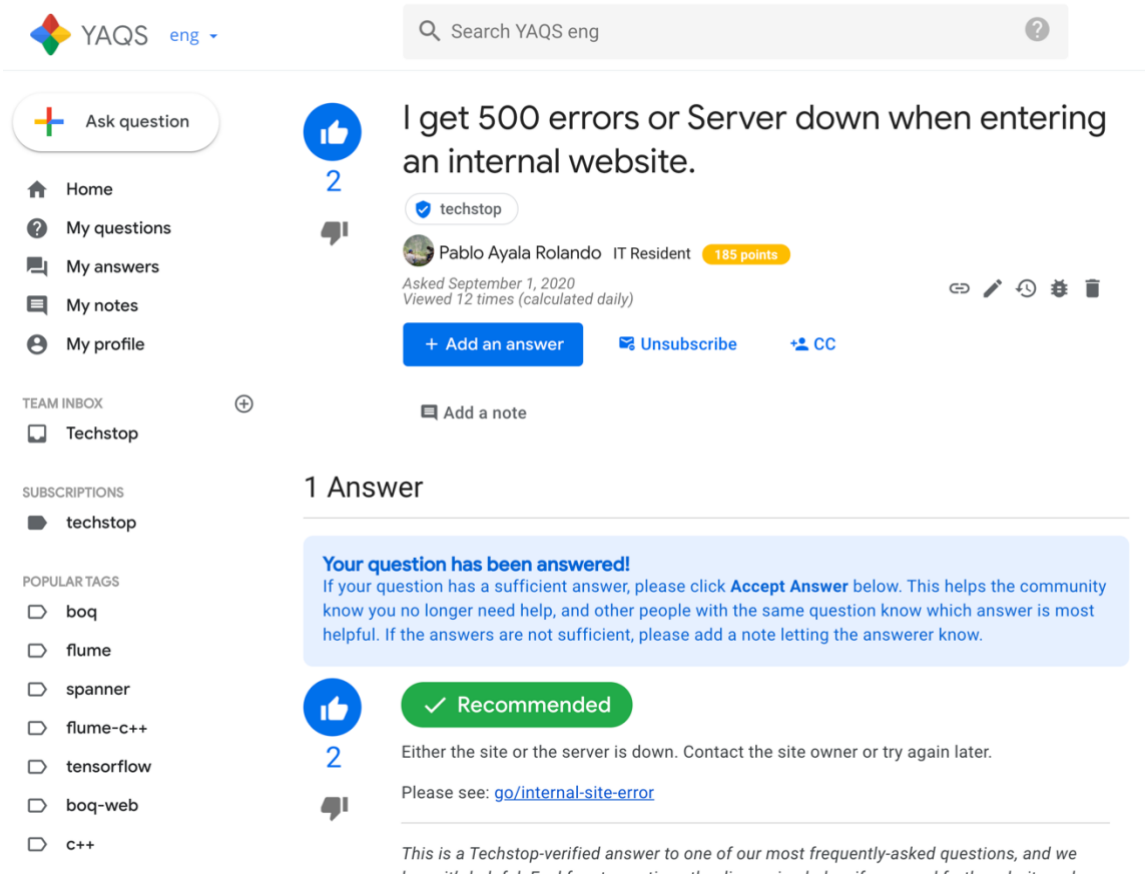
[4] Googler Engagement, Google. (2018) **GE Machine Learning Operational Review**. Global.

[5] Googler Engagement, Google. (2019) **Self Service & Automation Strategy**. Global.

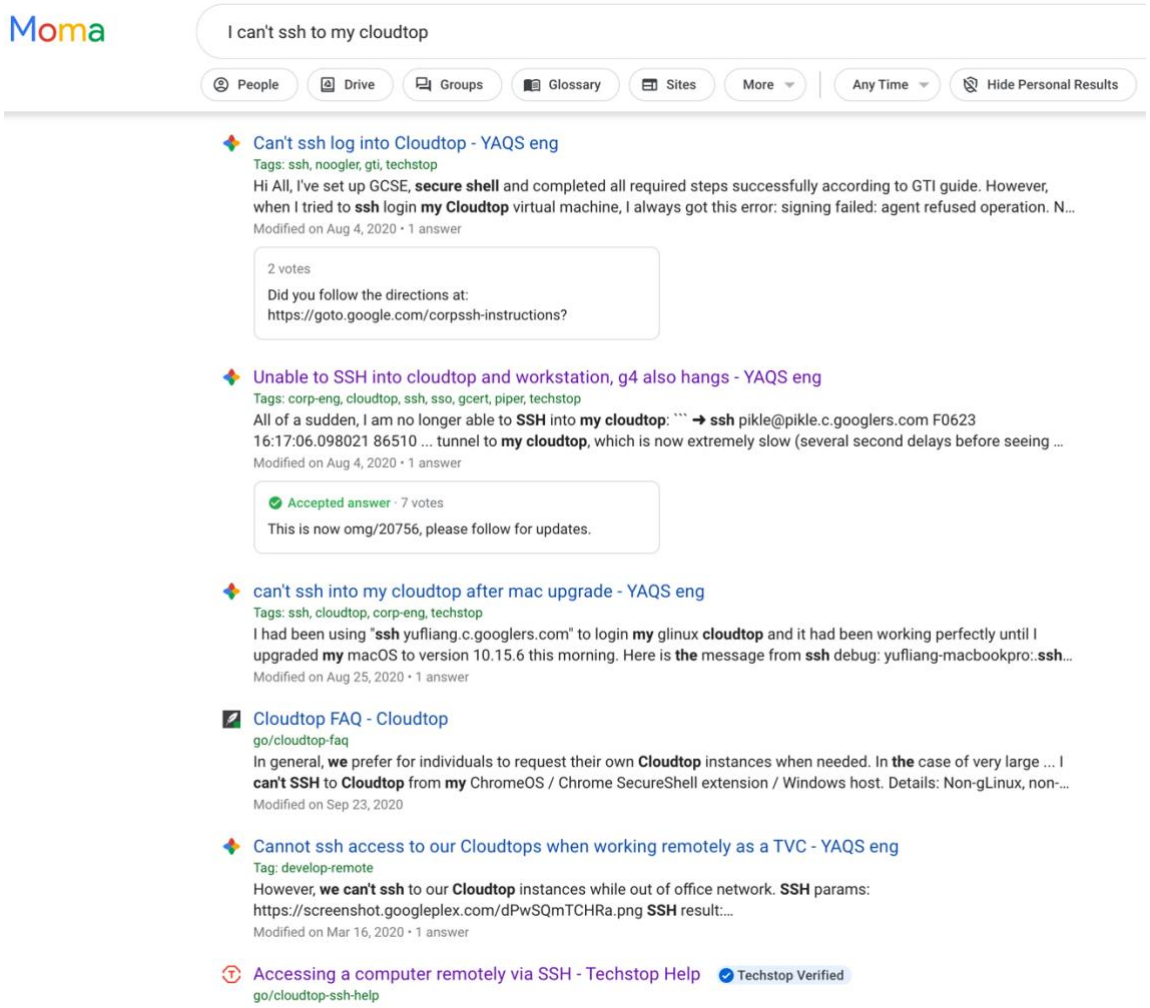
[6] Core UX, Google. (2019) **Techstop Brand Perception Survey.** Global.

A N N E X E S

ANNEX A: YAQS SCREENSHOT



ANNEX B: MOMA SCREENSHOT



ANNEX C: STANDARD OPERATIONS PROCEDURES

Introduction, Scope & Guiding principles

Scope of SOP

The current iteration of this guideline covers the operations of techstop related questions in YAQS.

What's YAQS

YAQS (Yet Another Question System), accessible via go/YAQS, is an internal question and answers site focusing on technical content.

You have probably used similar QA sites before, like quora or StackOverflow.

The goals of YAQS are:

To enable Googlers to quickly get answers to Google-specific technical questions.

For teams to reduce support time by avoiding answering the same question repeatedly.

All FTEs and non-restricted TVCs can access YAQS. Restricted TVCs can access it by being part of restricted-yaqs. This can be requested in lantern.

Guiding Principles

There are no bad questions, no matter who asks.

There are no bad answers, no matter who answers.

As YAQS is a public space, we strive to maintain psychological safety. Without psychological safety, no one can post.

As YAQS is a public space, we strive to protect privacy. We aim to prevent any PII issues by transferring pertinent questions to GUTS.

All questions are equally important.

Unlike other techstop channels, YAQS questions may not have a single assignee.

Every answer should add value to the Googler or bring the issue closer to resolution. YAQS support is not in real time, so it's critical to make each update meaningful to avoid unnecessary delays to the user.

It's better to provide a quick general or high-level answer than a slow in-depth answer

Roles and Responsibilities

ITRs and COEs

ITRS and COEs are primarily responsible for the health of Techstop queues in YAQS. They will either be assigned specific YAQS shifts (Yoda) or will be answering YAQS questions as time permits during other shifts.

Yaqs On Duty Assignment (Yoda) shift

The Yodas (Yaqs on duty assignment) are responsible for providing quality answers to questions that haven't been answered by the community. As Yodas can't know everything, they're expected to go through Gray's search order to find answers. They can also post the question in go/rs-comms, as someone may know the answer, and it may help others too. Consults are also a valid way of trying to get an answer (go/consult-runbook). Please go to the Yoda section of this document for more info on this shift.

You can view who is the current Yoda in go/yoda-schedule.

Other Techstop Community

As members of the Techstop community, we have to use our additional superpowers for providing answers to questions that have our tag, like recommending answers and marking questions as done. You will discover that actively participating in YAQS is also a great way to learn. YAQS will serve as an important knowledge base for solving issues during tickets/chats/phones as well. There are plenty of benefits of utilizing this platform so lets maximize it by being active contributors.

As members of the community, we can also ask questions to the community. This is highly encouraged as there are no bad questions, and your question will help others as well.

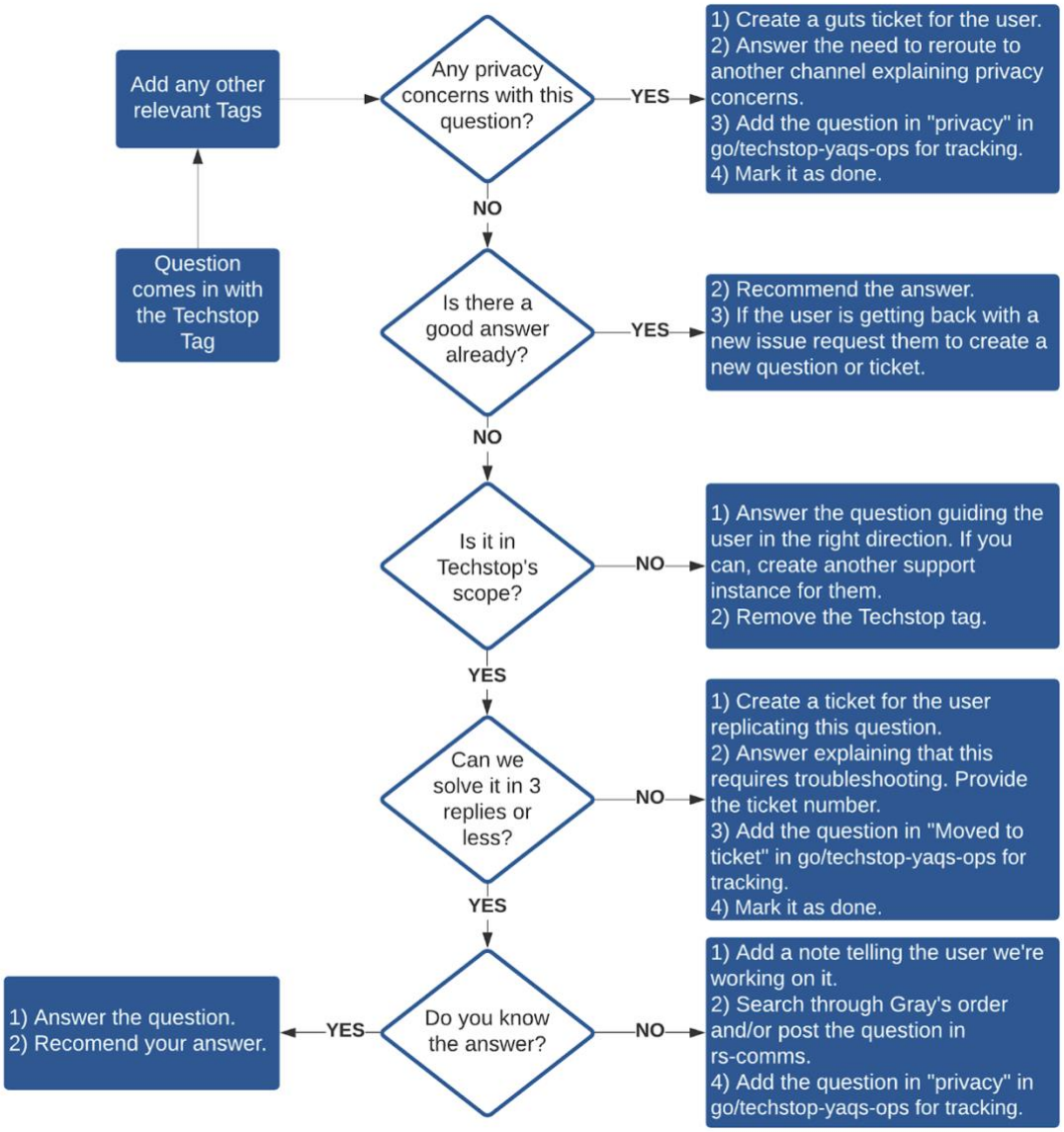
Subject Matter Experts

As experts in a particular area, Service teams own techstop-relevant tags. These experts can help answer questions that have their corresponding supported tag, especially challenging ones that others perhaps can't answer. You can add a supported tag to any question that's within the tag's scope. You can find these teams by clicking on each supported tag.

Google Community

Any Googler can answer a question in YAQS. Googlers answering questions play a crucial role in helping us out, but they aren't responsible for the quality of their answers. It's our responsibility to make sure those answers are accurate.

Life of a YAQS question

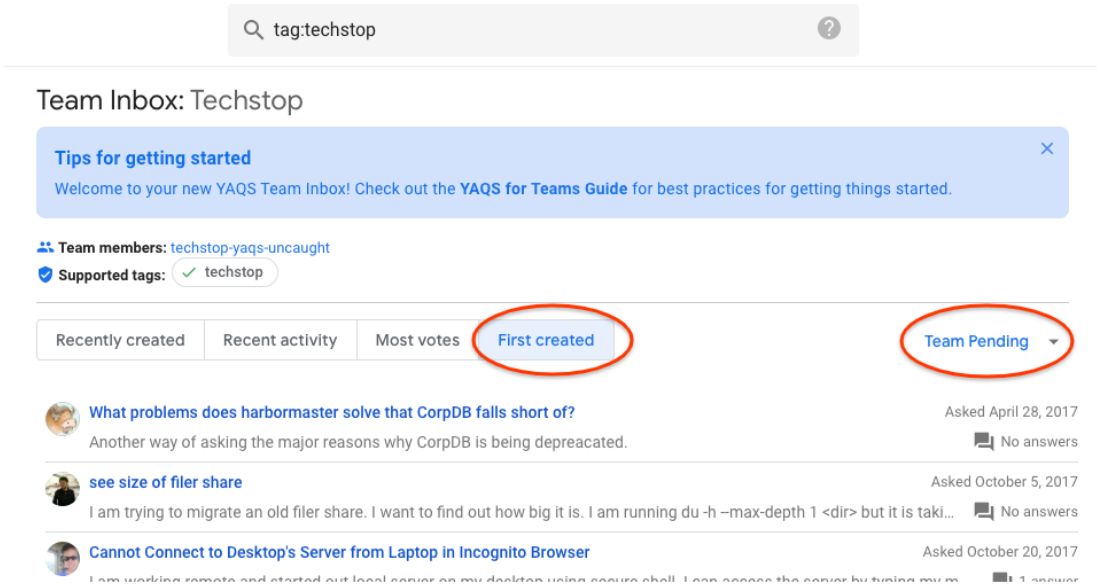


Team Inbox and Notifications

Team Inbox

The Team Inbox displays our YAQS queue. You can find the Techstop Team inbox on the left side pane of your YAQS dashboard or at go/techstop-team-inbox-yaqs.

Please make sure the questions are organized by “First Created” so the oldest questions appear first, and that they are filtered to “Team Pending” so you only see the actionable ones (see image below).



Notifications

To receive emails of new YAQS questions, you have to subscribe to the Google Group g/support-yaqs-emails.

You may want to create a filter for YAQS emails.

SLOs

First-time response: 24 hours.

Answer efficiency and planning

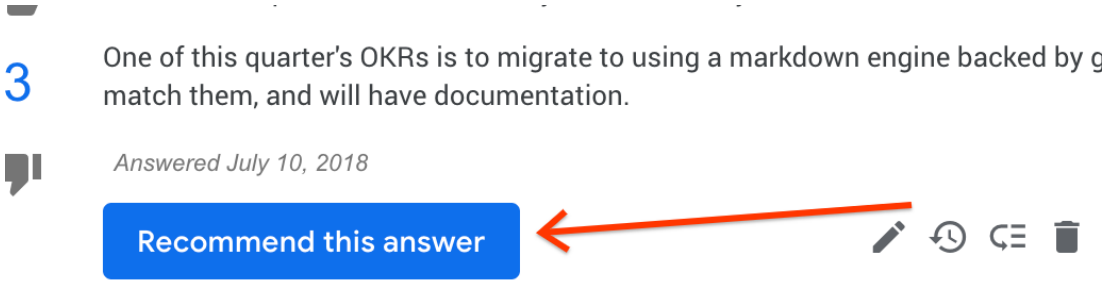
YAQS questions are meant to be answered quickly in one reply, but this isn't always possible as we may not know the answer, or it may not be possible to answer with the information provided. To take care of these questions, we created a procedure for keeping track of tough questions, described in go/yoda-shift.

For details on what composes a good YAQS answer, please see "How to Write Good Community Answers".

Actioning on questions

Recommend

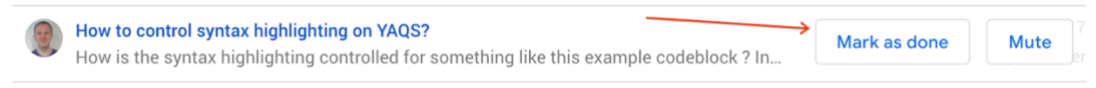
If a question has already been answered appropriately, please upvote this answer and recommend it. Only the Techstop community can recommend answers with the Techstop tag, and this gives an extra layer of trust to the answer.



If the answer is not appropriate, please provide another answer and recommend that one.

Mark as Done and Mute

Inside the team inbox, we can "Mark as Done" and "Mute" questions. Never mute a question as we'll lose track of it. The task of Mark as Done" is mostly done by the YAQS-on-duty shift, but help is always welcome.



Mark as Done: Removes the questions from the Team Inbox but it'll come back if it has new activity (a new answer or note). This should be done when the question has been answered, but the Googler may get back. If a user accepts an answer, or techstop recommends an answer, it will automatically mark the question as done.

Mute: Removes it from the inbox, and regardless of new activity, it will never come back. Because of this, we never mute questions.

Mark as featured

If a question is particularly useful for the time being, and there may be many other Googlers having this question because of a particular present event, like a KI, we have to mark this question as featured, so it appears in the Featured Questions section of the Techstop tag.

Note: Only questions with a recommended answer can be featured.

Remove

Questions can be removed or deleted. The most common reasons for removing a question are marking it as a duplicate or obsolete.

Upvote/Downvote

Votes determine whether an answer is good or not, and answers are displayed depending on their voting score. If you see a good answer, please upvote and if you see a bad answer, please downvote it.

Adding a Note

Notes can be added to questions and in answers. You can always add one, usually providing additional information or requesting additional information.

Tags

Tags are the YAQS taxonomy, so they're very important for us to collect data and make informed decisions.

When you are dealing with a new question, please make sure it has the right tags. Supported tags are the most important ones as they route the question to a specific team's inbox. It's always a good idea to add relevant supported tags so other teams can collaborate too. Adding unsupported tags also helps us as they provide more taxonomy data. You should also remove tags that aren't appropriate (i.e., If a question is out of Techstop's scope, you can remove the Techstop tag, see the life of a YAQS question).

Supported tags in YAQS have this blue shield icon: 

Supported Tags

Tag	Managing Group	Contact
Glinux	glinux-serviceteam@google.com	Mariagorbatova, jrallen
windows	winops-serviceteam@google.com	Mariagorbatova, hastin
networking	g/dls-controls	Rhume, tiegweathers
macos	macops-serviceteam@google.com	Mariagorbatova, joeprai
uberproxy		

ios		
groups		
chromoting		

Unsupported Tags

Ssh, gnubby, certificate, security-key, android,

COVID Urgent Tag

During these times, a new tag has been created, “covid19-urgent”. Questions with this tag will appear first in the Team Inbox.

Routing to another team

If a YAQS question has the Techstop tag but isn’t in Techstope’s scope, Techstop has to:

Answer the question guiding the user in the right direction. If it's possible, create another support instance for them recreating the question.

Recommend your answer.

YAQS on duty assignment (YODA shift)

As a Yoda, you are in charge of keeping our YAQS team inbox as tidy as possible while maintaining our SLO’s.

Our SLO is 24 hours for every new question that has the Techstop tag. You should watch our queue constantly and answer any incoming questions right away if possible.

You are not expected to know all answers, but you are expected to follow Gray's search order and approach the Techstop community to answer all questions.

Please check the Yoda Shift One-Pager.

Create questions for KIs

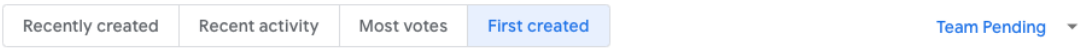
Check if there are any new KI's (Created today or tomorrow) that haven't been added to the KI tab of go/techstop-yaqs-ops. If there are, please create a question with the template below and then add it to the KI tab of go/techstop-yaqs-ops.

Hunt for questions without the Techstop tag

Refresh our database of techstop-relevant questions in the "raw data" tab of go/techstop-yaqs-ops and add the Techstop tag to any new questions that are inside our scope.

Tidy our YAQS Team Inbox (go/techstop-team-inbox-yaqs)

To view this queue, filter the inbox by "First Created" and "Team Pending".

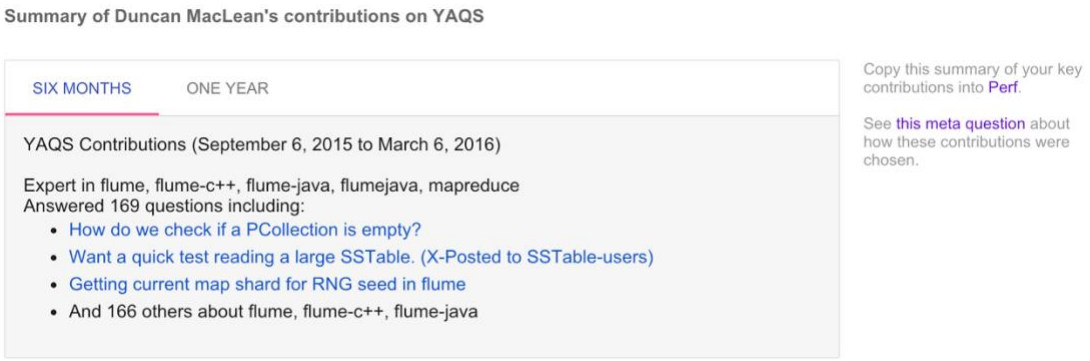


For each question in this queue, you should follow the Life of a YAQS question workflow.

Remember to always add our survey at the bottom of your answers:

YAQS stats for Perf

When the time comes, you can add your YAQS stats in your Perf and shine like a star! A summary will be generated automatically at the bottom of your YAQS profile.



Answer Templates

Requires more than 2 replies:

If the issue is for a live session:

Hi XXXX,

It would be easier to troubleshoot this in a live session as it requires multiple questions/back and forths. Could you contact us through go/techstop in a call or chat?

If you have an unregistered security key we'll help you register it in a call or chat, if not, we can help you order another one.

Kind regards,

XXXXX

If the issue is for a ticket:

Hi XXXX,

It would be easier to troubleshoot this in a ticket as it requires multiple questions/back and forths. I created ticket XXXX for you replicating this question, and we'll help you there.

Kind regards,

XXXXX

Out of Techstop’s scope

Hi XXX,

Thanks for reaching out.

This question is out of Techstop’s scope. I did some research and found that the XXXX team can help you with this.

Please contact team XXXX and get back to us in go/techstop or create a YAQS question if needed.

Kind regards,

XXXXX

Privacy Flag

Hi XXX,

Thanks for reaching out.

Please be aware that YAQS is a public space, and for us to answer this, we’d have to share private data here. Because of this, we have created ticket XXXXX to help you there.

Kind regards,

XXXXX

ANNEX D: YODA SHIFT ONE-PAGER

The Yoda shift consists of these 4 tasks. If there's no more work for you in a task, please continue to the next one in this order:

1. Tidy our Inbox (Questions with the Techstop tag)

Our goal is to have a recommended answer to every question. Go to our inbox in go/techstop-team-inbox-yaqs, and for each question, follow "Life of a YAQS Question.".

Please register what you did in each question in the Yoda Master Sheet;

1. Go to go/yoda-master-sheet.
2. Add the Question's URL and register your work in the corresponding columns.
3. Copy the Feedback Form in column F and add it at the bottom of your answer.

2. Check for questions without the Techstop tag

Go to our database of techstop-relevant questions in go/techstop-yaqs-ops. For any unreviewed questions at the bottom of the list, determine if the Techstop tag should be added. If you have added the Techstop tag to a question, it will now appear in go/techstop-team-inbox-yaqs, where you can follow "Life of a YAQS Question".

3. Create questions for KIs

Check if there are any new KI's that haven't been added in go/yoda-master-sheet. Please create a question with the template below in YAQS and then add it normally in go/yoda-master-sheet. Remember to add the flag "KI" and the KI Number in "Relevant Links".

Template

Question Title:

Known Issue: [Copy KI Description]

Description:

The following Googler-facing systems are affected: [Copy from KI Details]

Affected Googlers will experience the following symptoms: [Copy from KI Details]

Answer:

Please refer to the "Information for Googlers" section in [t/XXXXXXX] for the latest workaround.

Past workarounds may not be applicable now. Please use your knowledge and best judgment.

4. Seed a question from a previous ticket or a TSHC article

Please seed any question that would be a good fit for YAQS. You can find inspiration for this in your previous tickets/chats or in the articles listed in the second tab of go/yoda-master-sheet. If you choose one of these articles, please add your username to it, so we know you will seed from that one.

Please register the seeded question in go/yoda-master-sheet and remember to add a link to the article in your answer, as that's the source of truth. Please also add the article' in the column "relevant links".

Also, remember to add this note in your answer and recommend it: *This is a Techstop-verified answer to one of our most frequently-asked questions, and we hope it's helpful. Feel free to continue the discussion below if you need further clarity or have questions, comments, or suggestions!*

ANNEX E: HOW TO WRITE HELPFUL COMMUNITY ANSWERS

Authors: ericsheh, pabloayala, mattboulton
Status: Final

Be human

Empathize with Googlers, who need your help clarifying the problem. Try to understand the real need behind their questions. Example 1

Be useful

Keep your answers rooted in truth and reality. When possible:

- Test your solution before you respond
- Cite sources
- Provide specific and straightforward solutions (e.g. include step-by-step instructions)

Be simple

- Start with the most effective, likely solutions; don't overwhelm the Googler with too many solutions. Example 2
- If a help center article explains it better, provide the link and empower the Googler
- If more troubleshooting is required, encourage the Googler to contact go/techstop

Be clear

- Put important and distinguishing information first to enhance scannability
- Use headings, paragraphs, and lists to break up walls of text
- Use YAQS markdown to style your answers
- Write short sentences to enhance readability
- Avoid technical jargon
- Use visuals like screenshots or screencasts to clarify obscure instructions
- Summarize what's behind the link. Use internal links (where possible) over external links.
- Keep your language professional:
    - Address the Googler directly (e.g. *you* instead of *user* or *them*)
    - Use an active voice (e.g. *open the file* instead of *the file will be opened*)
    - Use simple verbs (e.g. *use* instead of *utilizing*)
    - Be polite, but using *please* in a set of instructions is overdoing the politeness
    - Avoid ableist or gendered language; be respectful and inclusive
- Use a community-style casual tone

Example 1

A Googler might ask if the archive file format 7z can be used in Google. This might be hard to answer, as it's likely not a single team in Google can give an authoritative yet comprehensive answer to this question.

So, instead of consulting SecOps for security opinions, consulting UX for usability opinions, and so on, we probably can make reasonable assumptions that the user is trying to find the best, easiest way to make an archive that is most compatible with Googlers' setups.

We can say that ZIP is a more compatible format, and modern operating systems have built-in support to archive and unarchive files in ZIP format, and that to use 7z, the 7-Zip application needs to be installed first. You can add a link to an article that demonstrates how to use ZIP on Windows / macOS.

Example 2

A symptom could have various root causes, and a problem can have different solutions. For example, if a Googler is asking what to do when the Touch ID prompt isn't appearing, we could:

- Troubleshoot the Chrome browser (Incognito mode, clear cache, and cookies, etc.)
- Restart the gNubby Touch ID daemon (Terminal command or restarting the computer)
- Provide rescue codes as a workaround

But we know restarting the computer (which restarts the gNubby Touch ID daemon) will solve most cases, so this would be the most reasonable first solution. Putting all possible solutions in a single answer may confuse the user.

Additional resources

- Google developer documentation style guide
- Writing for a global audience
- Accessible writing style guide
- Writing accessible documentation
- Writing inclusive documentation
- go/inclusive-words
- Google brand standards voice and tone