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August 17, 2020

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Dear Ms. Bains,

The Technical Interview Preparation Club is still in its infancy. To assist the membership in maximizing its effectiveness in accessing the necessary resources to succeed in technical interviews, please accept this report.

This report contains data compiled from ten members of the membership as well as research conducted using Gayle Laakmann McDowell's *Cracking the Coding Interview* was. The conclusion of this report contains recommendations to effectively capitalize on the knowledge of technical interview in the field of software development as well as the wishes of the membership.

Thank you for your support of this research process. I hope my recommendations address some of the concerns of the club membership. If you have any questions, please contact me at genevieve.bridge.bolduc@gmail.com.

Best Regards,

Genevieve Bolduc

Geneviève Bolduc

Comprehensive Resource Development for the Technical Interview Preparation Club

For Jenna Bains
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Technical Interview Preparation Club
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By
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Abstract

A survey of 10 members of the Technical Interview Preparation Club was conducted to gain their insight on what they felt would be helpful tools to access for their membership. Furthermore, an analysis of Gayle Laakmann McDowell's *Cracking the Coding Interview* was analysed to assess the key tenets of interview preparation. The survey was conducted as primary research in July 2020. The data retrieved from the literary research and survey was analyzed to determine a course of action to compile a shared body of useful resources for the TIP Club. The results of the interview and survey of employees show that the current membership desired a shared Google Drive that would have resources on various tech companies and additional technical knowledge asked during interviews. The results of the literary research offered a model for information consolidation to be integrated with the wishes of the membership. The proposed recommendations for improved accessible resources based on the findings of this report are:

1. Creating a Google Drive accessible to the membership of the club.
2. Creating a separation of folders based on the Interview principles outlined by Laakmann McDowell.
3. Asking membership to catalogue their work and interview experience within the assigned categories.
4. Submitting any archived problems into their respective folders

Introduction

The Technical Interview Preparation club (TIP) is a student-led group that meets weekly to build up interview readiness. Currently, the format is weekly video conferencing where students and recent alumni present and solve algorithms that might be asked in interviews by future employers. These questions are pulled from the popular website LeetCode, which showcases problems asked by companies including, but not limited to FAANG (Facebook, Amazon, Apple, Netflix and Google). These employers are at the forefront of software innovation and hire many graduating students every year. Currently, LeetCode is the only source the club is utilizing. However, problem-solving is only one aspect of getting hired. Gayle Laakmann McDowell, author of *Cracking the Coding Interview*, outlines many aspects under review in an interview: analytical skills, coding skills, technical knowledge, experience, and culture fit (Laakmann McDowell, 4). Currently, the club does not have a body of resources to sharpen all of these skills, nor do the weekly mock interviews necessarily measure for these.

Problem Statement

The Technical Interview Preparation club does not effectively capitalize on its mandate. Student readiness for these challenging interviews should take into account wider skills than algorithm solving. With improvements, students and recent alumni will attend interview with improved skillsets and able to perform well in all respects.

Proposed Solution

The TIP club should build an accessible and shared body of literature that develops the necessary interview skills. Different exercises and resources should be available to practice said skills. There are many examples of what might be added to this package. For instance, technical knowledge often refers to broader questions in computer science, often around design patterns and practices. Common questions like these could be compiled into a unified document. As for experience, resources could be shared on building individual and group projects on a resume. How to get started? What tutorials are useful? As for culture fit, employers could be interviewed for more detailed insight on what they search for as well as sifting through the popular website Glassdoor to consolidate this information. All of these could be collected and archived in a shared folder.

Scope

To assess the feasibility of the proposed solutions, the following five areas of inquiries will be pursued:

1. What additional skills would members of the club like to practice?
2. What non-algorithm based factors are most important in interviews?
3. What are common theory questions asked in interviews?
4. Where to get started with extracurricular personal and collective technical projects?
5. What are the ideals of company culture at different tech companies, local and international?

Methods

The methods consist of conducting anonymous surveys among members of the TIP and collecting interviewing criteria from the bible of software engineering interviewing: *Cracking the Coding Interview* by Gayle Laakmann McDowell.

Qualifications

As a fourth-year computer science student nearing graduation, as well as one of the organizers for the TIP club, this project is based in familiar knowledge such as industry information, technical interviewing experience and club policies.

Audience

The intended audience for this formal report is the leadership and membership of the TIP club. With their efforts, a community resource can be built to address the lacking elements of the club.

Conclusion

There are many ways to succeed in the field of computer science, and those who collectively organize to better their skills should be able to access a large body of helpful resources.

Data Section

Analysis of Interview Facets

Based on *Cracking the Coding Interview*, the skills required for successful interviews are analytical skills, coding skills, technical knowledge, experience, and culture fit (Laakmann, 4). Broken into greater depths, analytical skills represent an interviewee's ability to break down a problem and piece together a preferable optimal solution. Coding skills represent the cleanliness and accuracy of the code. Was the solution effectively translated into code? A good solution will only go so far if it is not properly executed. Interviewers will be seeking well-coded solutions. Technical knowledge refers to fundamentals of computer science. Interviewers can assess technical knowledge by asking about any basic concepts or technologies. These questions can be particularly challenging because the body to choose from is extremely vast. Experience can be measured in terms of both soft skills (leadership, drive, initiative) and technical skills (projects, Hackathons, technical work). An interviewee able to highlight those skills and provide detailed insight into their experience will have a competitive edge. Tools like a detailed resume will serve as an asset here. Culture fit is a slightly more nebulous criteria because it can vary between companies. Some of the larger aspects that can be analysed in this context are effective communication

and shared values. Does the interviewee express themselves clearly? Does the interviewee's personality mesh well with the interviewers? These guiding principles for interviews provide a holistic perspective on interviews for prospective software engineers.

Membership Requests

The surveys conducted polled the TIP membership for multiple factors primarily based on experience (interviews and work) as well as prospective requests for club improvements. Ten members of the existing seventeen filled out the surveys. Requests from the membership were assessed by the following questions:

- 1) What could the TIP Club improve on?
- 2) Would you like a unified folder that anonymously catalogues the working and interview experience of TIP members?
- 3) If so, where would you like to see this information?
- 4) What, if anything, would you like to see specifically catalogued?

TIP Club General Improvements

Question 1 from the above list was a long-answer text question designed to assess any shortcomings of the current TIP format. The main results could be categorized into three primary categories and a few outliers.

Category 1: Theoretical Questions

This pattern emerged from the following requests:

- "It would be cool to have more questions about design patterns and theory. I feel completely unprepared for these categories but am feeling good about my algorithms."
- "More CPSC310 exam-type questions please! I've already forgotten about most of those slides..."
- "I want to know how I might be tested about specific languages. Do interviewers just ask you to code in a language that you've put on your resume or do they ask about how the language works?"

The reference to CPSC 310 questions is in regard to the UBC CPSC 310 software engineering course. Many theoretical concepts were covered and tested in this course. They include: abstraction, async, automation, testing (white box and black box), design patterns, design principles and many, many more. Because of this, this comment was filtered as theoretical. Knowing the intricate details of language operation could be filtered in both practical and theoretical categories but because of the excerpt "how the language works" suggests language fundamentals. For these reasons, they were sorted as part of the above categories.

Category 2: Company-based knowledge

This pattern emerged from the following responses:

- "I'd like to know which companies are LGBTQ+ friendly."
- "It'd be nice to have testimonials from co-op students and recent grads who've worked at various tech companies. It's not always an indicator but it's nice to know how workers feel about it."
- "I don't know most local tech companies, I see them on the co-op boards and, apart from the giants, I have no idea what they do and what their workplace is like."
- "It'd be nice to be informed of Networking events once we graduate and don't receive the UBC e-mails anymore".
- "I'd like to see what companies asked what coding questions/"

The above responses can be broken down into company-based knowledge and cover the following facets: company culture, mandates , networking and interview practices.

Two outliers that were not able to be categorized as cleanly as the above were reported.

- "People need to respect the time limit in the video calls. Sometimes it goes on too long because of the questions, when they could be addressed via chat afterwards."
- "We should get access to funding so we can expand."

Both of these are outside the scope of this project. The first because it relates directly to management of existing protocols rather than the expansion of resources to fulfill its mandate. The second because financial resources are not the subject of this investigation. Although funding is instrumental in accessibility to resources, a separate budgeting proposal could better address this topic.

Documentation

Questions 2-4 outlined in the membership requests introduction pertained to prospective shared documentation accessible by the members of the TIP.

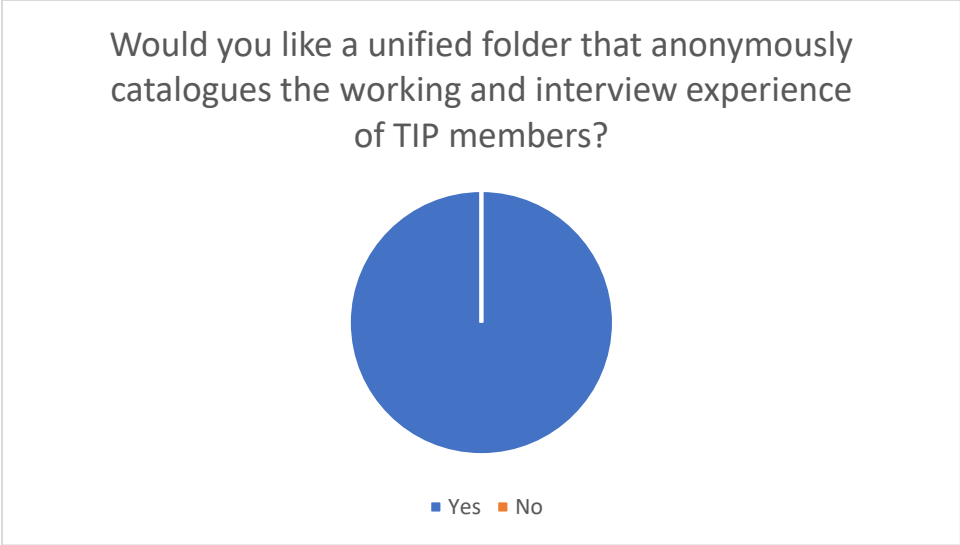


Figure 1. Pie Chart of Cataloguing Question

As demonstrated in figure 1, the ten members who filled out the survey answered yes to the cataloguing.

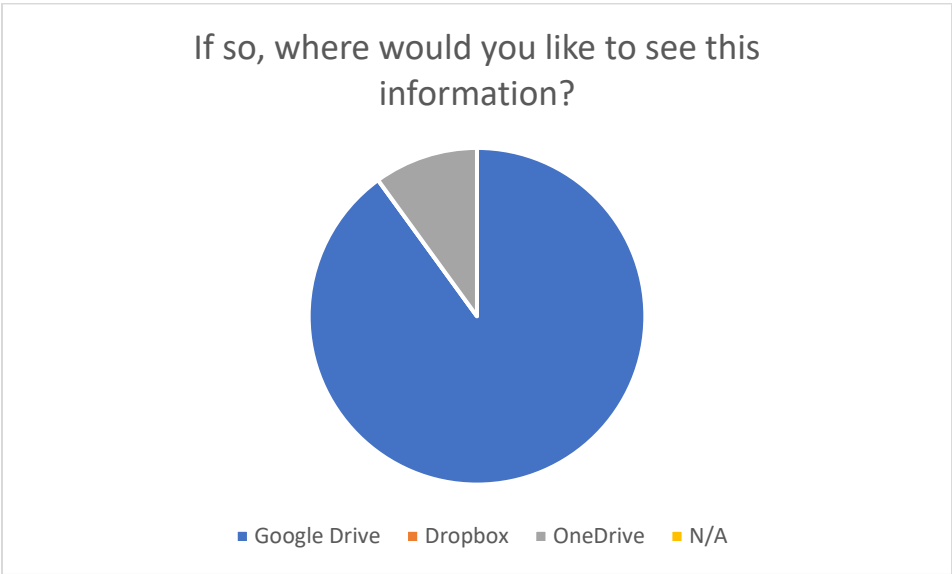


Figure 2. Pie Chart of Resource Sharing Medium

A large majority (9/10) indicated Google Drive as their preferred resource sharing medium.

Question 4 was a long-answer text question to see what the membership felt would be important to have in the body of shared documentation. Here are the answers that were submitted:

- “Company reviews, anonymous and accessible only to the membership.”
- “I’d love to see what corporations asked what questions during interviews.”
- “I mentioned this earlier, but maybe some mini-profiles on companies or something along those lines.”
- “Technical problems that people had to solve in their interviews.”
- “Experiences LGBTQ+ folks have had working in tech”
- “Tips that worked for people during interviews. Like what to do if you’re blanking.”
- “Maybe a list of recruiters to add on LinkedIn?”
- “What people’s experiences were with different companies. A mini-GlassDoor situation”
- “Anything useful really.”
- “Technical problem list and Youtube explanations of solutions.”

Experience

Members were asked whether they interviewed in the tech industry. Eight “yes” responses and two “no” responses were submitted. Among the “yes” responses, two members said they experienced between 1-5 interviews, three members responded that they had experience 6-10 interviews, two members stated 11-15 interviews and one member said 21+.



Figure 3. Summary of Interview Experience

Subjects were also asked whether they had work experience. Six “yes” answers and 4 “no” answers were submitted.



Figure 4. Summary of Work Experience

The survey extracted information about interview and work experience. The interview segment was designed to collect information about what questions were asked to the subjects in their interviews, while the work experience section a feel for work cultures.

Interview Experience

The core interviewing question was “Please describe any questions that you remember from the interviews. If able, let us know which company the question was asked by.”

Here are some of the responses:

- “SAP asked about the Fibonacci sequence”
- “Samsung asked me to write an algorithm that locates all the numbers that have only the same digit (i.e. “1”, “22”, “888”) within a range of n numbers”
- “AppNeta asked me to explain what a React component was and to code a component”
- “Blackbird gave me a take-home challenge. I forget what it was now, but it was three questions.”
- “Google asked me this Leetcode question <https://leetcode.com/problems/climbing-stairs/> “
- “It’s all a blur TBH.”
- “I interviewed for Hootsuite, they asked me about the 3-color graph problem.”

Work Experience

Subjects with work experience were asked which companies they had worked for and to give them a rating between 1-5. In this instance, no two candidates worked at the same company. Therefore, the individual rating were as seen below in Figure 5.

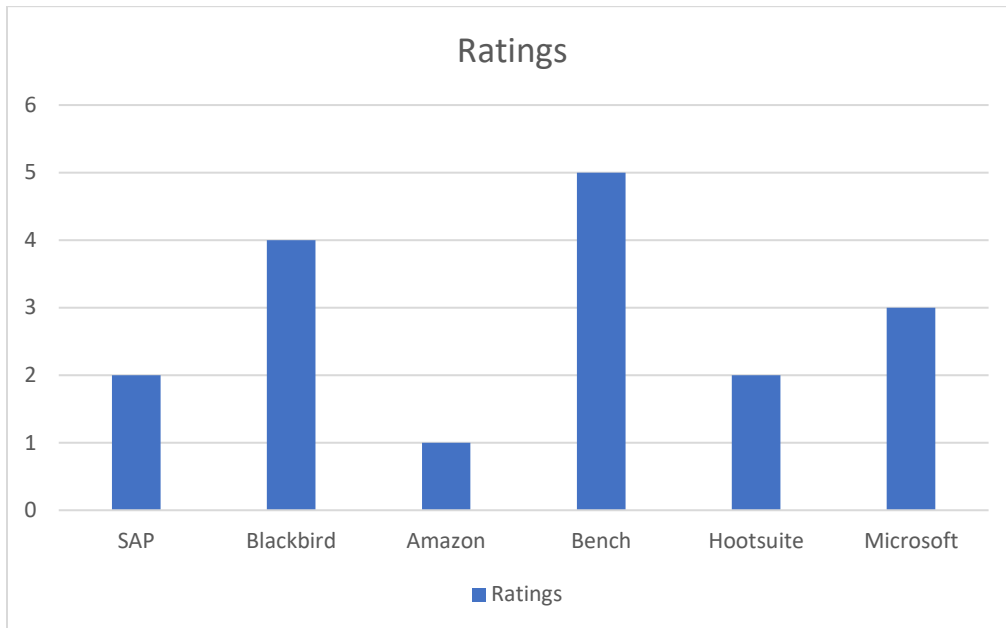


Figure 5. Company Ratings of TIP Membership with Work Experience

A central question to this section was “Describe the work culture” of the respective company the subject rated. Since this was a long-answer text question, the responses were varied:

- “SAP was weird. It felt very cliquy. And if you didn’t like the team you were on, you were SOL.”
- “I liked my time at Blackbird. At times, the work felt above my skillset but everyone was real nice about it.”
- “Amazon was the worst. Bad ethics and they expected you to work insane hours.”
- “Bench was great! I really felt like everyone was there to support each other, and I was able to directly contribute to product features.”
- “Hootsuite had a super bro-y vibe. Not surprising though when you think about how employees would ice each other just a few years ago.”
- “Microsoft is okay. Some nice perks. Will probably continue working there until I get tired.”

Conclusion

The data collected provides a tangible screenshot into the requirements for successful interviews as well as the wishes and experience of the TIP membership.

Summary and Interpretation of Data

The Laakmann McDowell research provided a framework of understanding software engineering interviews in the tech sector. From this, the most pertinent interview aspects were revealed to be:

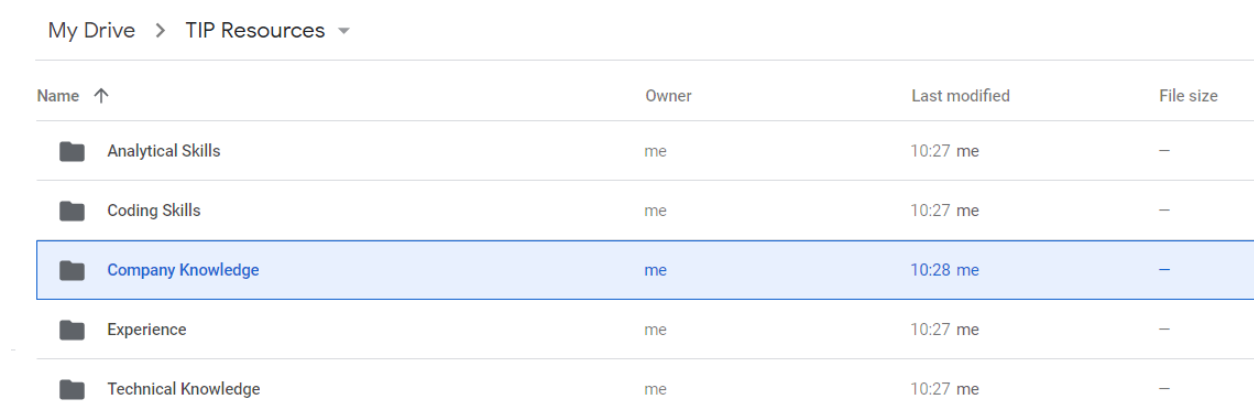
analytical skills, coding skills, technical knowledge, experience, and culture fit. The TIP Club in its current iteration tests for analytical skills and coding skills. With open-ended questions in the survey, it was easy to assess whether the membership felt if it was lacking in other aspects. This was reflected by the theoretical and company-based knowledge categories that emerged from the data.

This project also investigated whether the TIP Club would express interest in a shared pool of resources. With a unanimous yes (Figure 1), this can be established as a definite interest for the existing membership. A majority opted for Google Drive as a shared medium.

From the assessing of resource collection, it follows that the subjects were polled on their experience. This line of questioning provided a sample of interview questions posed in the industry, as well as subjective ratings (Figure 5) and comments. The results were unique and varied.

Proposed Solutions and Recommendations

Based on the data, the following recommendation ensues. A shared Google Drive folder should be created to host the lacking resources of the club. The sub-folder hierarchy should be based on the Laakman McDowell model in the collected data. Below is an illustrative mock-up:



The image shows a screenshot of a Google Drive interface. At the top, it says 'My Drive > TIP Resources'. Below this is a table with four columns: 'Name', 'Owner', 'Last modified', and 'File size'. The table lists five folders: 'Analytical Skills', 'Coding Skills', 'Company Knowledge', 'Experience', and 'Technical Knowledge'. The 'Company Knowledge' folder is highlighted in blue. All folders are owned by 'me' and were last modified at 10:27 or 10:28.

Name	Owner	Last modified	File size
Analytical Skills	me	10:27 me	–
Coding Skills	me	10:27 me	–
Company Knowledge	me	10:28 me	–
Experience	me	10:27 me	–
Technical Knowledge	me	10:27 me	–

Figure 6. Prospective Google Drive

A slight modification of the model is proposed from culture fit to company knowledge. This was rooted in the company-based data category that emerged from the question “What could the TIP Club improve on?” The data collected from these questions highlighted a desire for information about the culture but also on more detailed knowledge like interview practices. The analytical skills and coding skills questions that the TIP already cover could be archived within these sections. The theoretical knowledge questions that emerged as part of the ask could be filed under Technical Knowledge. The working experiences, company ratings and interview practices such as the ones collected within the data could be stored in company knowledge. No data surfaced from the surveys about the ‘Experience’ model of Lakmann McDowell, which related to technical projects, hackathons and other such items one might find under an interviewee’s resume. The folder could remain for prospective interest despite the lack of

data supporting a want for this because of the limitations. In summary the recommendations are as follows:

1. Creating a Google Drive accessible to the membership of the club.
2. Creating a separation of folders based on the Interview principles outlined by Laakmann McDowell.
3. Asking membership to catalogue their work and interview experience within the assigned categories.
4. Submitting any archived problems into their respective folders

Limitations

A few key limitations are at work in this study. The membership is small and the quantity of members who responded to the survey is even smaller. These results provide very specific membership wishes at a very specific moment in time. With the high turnover in this sort of club, it is possible that those wishes might change. It is also why the archive was modeled with the Laakmann McDowell model. This model is an industry standard so it makes sense to center the wishes of a changing population around a recognizable model. Although there may be many other interesting ways to prioritize the information, this study provides a launching spot to begin resource collection that is requested by the TIP membership and should be able to elevate the caliber of the individual interviewees.

References

McDowell, Gayle Laakmann. *Cracking The Coding Interview : 150 Programming Questions and Solutions*. Palo Alto, CA :CareerCup LLC, 2011.

Technical Interview Preparation Club Form

This survey is conducted as part of the Technical Interview Preparation Club. It was prepared by a fourth year UBC Student who is part of the club membership. The prime objective of this survey is to collect data which, in turn gets analyzed to create a body of relevant documentation and procedures to succeed in technical interviews. The data will be summarized and presented to the membership of the club. Your answers are voluntary and anonymous. There are four sections to the survey, two of which you will only be directed to if you have work or interview experience in the tech industry.

1. How long have you been a member of the TIP Club?

Mark only one oval.

- 0-3 months
 3-6 months
 6-9 months
 1 year+

2. What do you like about the TIP Club?

3. What could the TIP Club improve on?

4. Have you interviewed in the tech industry?

Mark only one oval.

Yes *Skip to question 6*

No

Work

5. Have you worked in the tech industry?

Mark only one oval.

Yes *Skip to question 12*

No *Skip to question 16*

Skip to question 16

Technical Industry Interviews

6. Roughly how many times have you been interviewed for a developer position?

Mark only one oval.

1-5

6-10

11-15

16-20

21+

7. What were the formats of your interviews?

Tick all that apply.

- In Person
- Phone Call
- Online Call
- Take-Home Coding Challenge
- Other

8. How did you prepare for your interviews?

9. What do you think helped you most in your successful interviews?

10. Please describe any questions that you remember from the interviews. If able, let us know which company the question was asked by.

11. Have you worked in the tech industry?

Mark only one oval.

- Yes Skip to question 12
- No Skip to question 16

Skip to question 16

Technical Industry Work Experience

12. Which tech company have you most recently worked for?

Mark only one oval.

- Facebook
- Apple
- Amazon
- Netflix
- Google
- Microsoft
- SAP
- Hootsuite
- Other: _____

13. How would you rate your experience working for this company?

Mark only one oval.

- | | | | | | | |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|
| | 1 | 2 | 3 | 4 | 5 | |
| Very bad | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Very good |

14. Describe the work culture

15. What advice would you give to a TIP member trying to get a job there?

Documentation

16. Would you like a unified folder that anonymously catalogues the working and interview experience of TIP members?

Mark only one oval.

- Yes
- No
- Other: _____

17. If so, where would you like to see this information?

Mark only one oval.

- Google Drive
- Dropbox
- OneDrive
- Not Applicable, I do not want documentation
- Other: _____

18. What, if anything, would you like to see specifically catalogued?

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