Cross Domain File Transfer for AWS Internship
(Technical Project)

The Imbalance of Academic Load and Job Application Process on College Senior's Health
(STS Project)

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On my honor as a University student, I have neither given nor received unauthroized aid on this
assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

My technical paper is titled "Cross Domain File Transfer for AWS Internship". As a software development engineer intern during the summer of 2022, I was tasked with creating a feature for an existing cross-domain service called AWS Diode that allows customers in higher security regions to source individual objects upon request from repositories that exist in lower security regions. The work was done over the course of 12 weeks, and the accomplished product was a proof-of-concept that allowed HTTPS requests to be sent to a private API which performed the actions specified by the high-side customer's input to find and retrieve objects.

My STS project is an exploration of the imbalance of academic course load and the job application process on college seniors' health, specifically those that are in search of software engineering positions upon graduation. My STS research question is "How does job hunting as a college senior impact their health?" This question is important as many students struggle with their mental and physical health as they juggle what seems to be like having two full-time jobs.

Although there is a very minute connection between the technical project and the STS project in that there is a similar experience in balancing school work and the internship application process, the question I am asking is not relevant to the technical project.

The prospectus will primarily be structured around the personal testimonials that I have gathered during the course of inquiring about my research question. I will first lay the foundation of the reason for which I am writing the paper. Interviews and survey statistics will be shown and analyzed to illustrate the impact that it has had on the interviewees who are currently in the midst of balancing school work as well as applying for full-time positions as software engineers.

Secondly, I will present viewpoints from articles that speak on the preparedness of students for the professional software engineering field. This will also include findings on possible issues that the current job application processes have. These sections will present to a degree the lack of alignment between computer science education and the interviews conducted by companies.

Lastly, I will present possible improvements that can be made by the universities to help students. The information and recommendations made in this section will come from the

interviews and popular websites for recruiting that have articles on how college seniors can balance school work and job applications. This will serve to highlight the idea that the stress-inducing nature of interviews can possibly be aided by a reformation to prepare students for the software engineering field.

Technical Project

My technical project involves my summer internship project at Amazon Web Services. I was part of the Diode team within the AWS organization (Amazon.com), and my project as an intern at AWS was to stand up a service that allows customers on the high side to retrieve low-side files directly from the low-side repository.

Current users of AWS Diode cannot source files that exist in low-security domains (low-side) from a higher-security domain (high-side). With AWS Diode in service as it is now, its low-side users must duplicate their data repositories onto all relevant domains and sync it constantly for Diode to be usable for the average use-case of the high-side customer. Companies that require interactions between repositories in cross-domain regions can employ this solution to retrieve object files upon request, saving customers a lot of time and effort under the condition that a mapping exists between the high-side and low-side customers' AWS accounts.

We used AWS's Cloud Development Kit in conjunction with existing cross-domain solutions to run the backend. We also used a variety of AWS services including ApiGateway, VPC, Lambda, etc. to create the service. The CDK was used to stand up the infrastructure and resources necessary to act on behalf of the low-side customer. AWS Lambda was used to implement the functionality of the service, and ApiGateway, VPC, and others were utilized to create a way for HTTPS requests to be routed to and from this solution.

By the end of the internship, we had built a successful but limited proof-of-concept that performs the actions of the low-side customer without the low-side customer having to take any action at all. For this project to become a viable customer-facing feature, there are steps that need to be taken to provide the best customer experience.

Firstly, a requirement this solution lacks is that it must get approvals from the security managers. To have generic schema definitions approved such that any customers who onboard

with this solution are able to start using the service immediately is a crucial part of getting this service up and running.

Secondly, they must expand on a limitation that the service has due to the existing limitations of the S3 API. As the solution is currently constructed in its beta form, it is only a viable solution for low-side repositories with up to 1000 objects. Any repository with a greater number of objects than a thousand has a chance that the object will not be found. This is a crucial limitation of the service, and the best way to work around this must be figured out.

Thirdly, an optional but very useful addition would be to stand up a matching high-side service that performs most of the business logic on behalf of the high-side customer. This will work toward creating the originally envisioned usage of the feature and make the high-side customer's experience better thereby making the overall experience more fluid and easy to understand.

STS Project

My research question is "How does job hunting as a college senior impact their health?" Health, for the intents and purposes of this paper, will encapsulate mental and physical health. As for mental health, I will be using the definition provided by MentalHealth.gov. Mental health includes the emotional and psychological effects that are experienced by individuals. It also includes social well-being as a part of mental health as a large part of it comes from healthy interactions with people in their social groups. As for physical health, I will be using this terminology to describe the impacts on the body, its functions, as well as its maintenance by its person.

I will be exploring the usage of technologies such as video conferencing software, job boards, and interview practice websites. These are the technologies that I've encountered most frequently from my own experience. Technologies such as these have certain embedded biases and have the potential to cause distress for college seniors. Some of the distress comes from the lack of access to these technologies and the companies' assumptions that students have access to these technologies. Distress also comes from the time it takes on these technologies which must be balanced with the time taken for their course work. It also comes from the lack of relevant

preparation by the academic institution and the lack of transparency in the recruiting process by the companies. These same technologies can also have positive effects if incorporated into the academic preparation of software engineers.

There are three relevant social groups: college seniors, companies hiring entry-level software engineers, and academic institutions. The students I am specifically focusing on are those that are pursuing a career in software engineering. College seniors and their perspectives are crucial for this paper because their health is what I'm exploring for the paper. Companies hiring seniors are also important to the paper as they determine the technologies that will be used in the recruitment process and set standards and expectations for college seniors seeking employment. Academic institutions are extremely important in the context of this paper. They can be seen as having the greatest potential in helping students maintain their health while balancing courseload and job search.

There is a fourth relevant subgroup which is the students who don't have access to the aforementioned technologies related to the hiring process. This subgroup of college students will not be explored in depth but will be mentioned throughout the paper to remind us of certain embedded biases within the system of the recruitment process. However, this conversation is beyond the scope of this paper and requires a different approach and research methodology as it focuses more on inequity.

Research Methods

The research method that I will be using primarily is ethnography. As this paper seeks to provide insight to academic leaders and students seeking health maintenance due to overworking, it is my belief that personal testimonies will provide the most real perspectives, and empirical data will be important in this paper to demonstrate the necessity of balance for college seniors and their health. The leaders and students of these institutions are the most important demographics and are the intended audience. Information that I personally acquire from these sources will serve to provide the basis for my arguments and recommendations throughout the length of this paper.

To further supplement my research, I will also look into previous papers that look at the relationship between the readiness of students thanks to the preparation by the academic

institution they are a part of and the professional software engineering field where they apply the knowledge they learned.

Timeline

The timeline that I will follow for this paper is to first conduct surveys on students such that the results can statisticize the health effects that the students have personally experienced during these times. During this same time, I will have conversations with students who are currently going through the recruitment process. I will have follow-up conversations with them to find out if there are any differences in their health over that span and/or check on their ability/inability to balance the school work with their job search. I will also have conversations with professors that can provide insight into what could be done from their perspective. The surveys and interviews/conversations will be finished around November 20, 2022. I will be reading studies until December 2022 on the preparedness of college students for the professional software engineering field to add to the personal research I will be conducting. The research portion will happen over the course of the next seven weeks as many students are currently in the midst of the hiring process.

Key Texts

"270 Applications and 7 Months of Interviewing to Land a Job as a New Grad" by Vincent Yeh

This piece illustrates the detailed experience of a college student that went through the job search process. Yeh went on to apply to 270 jobs and received 3 offers over a grueling 7 months where, in his words, he "heavily limited many of my non-job search activities such as sports, gaming, socials, and sometimes academics". This article is relevant because Yeh's experience is not atypical. It represents what many students who pursue software engineering go through, and the detailed documentation of his journey to his first accepted offer as a newly graduated college student will help enlighten the reader about what the current "balance" of coursework and job search is like.

"A Graduate's Guide to Maintaining Mental Health During the Job Search" by Jane Murray of Indeed.com

Indeed.com is also a popular website for career resources and job searching. This article outlines reasons for mental struggle during this period of seniors' lives and also mentions methods for overcoming them. It mentions that job search anxiety is a real issue and can come from multiple factors such as uncertainty in career choice and competition. The information in this article provides me, as the writer, with more places to research, and it also helps provide ideas on how students can take care of their mental health. This article is again limited in that it pertains to all students and not specifically those that are pursuing software engineering.

"More Than Just Good Grades: Candidates' Perceptions about the Skills and Attributes Employers Seek in New Graduates" by Manuel Salas Velasco

This paper outlines the idea that what students believe to be important for recruiters and what employers think is important about students are different. It states that rather than a good academic standing, the personality and soft skills of students seem much more important to employers than students realize. This is illuminating because this is not taught at schools and is something that could help students be more successful. This article is again limited in that it pertains to all students and not specifically those that are pursuing software engineering.

"Perspectives on the Gap Between the Software Industry and the Software Engineering Education" by Damla Oguz and Kaya Oguz

This paper states that there are gaps between the entities involved in the hiring process for this field. The perspectives on the gaps come from both sides where companies "expect competent graduates" and students come into the industry realizing it's very different than their academics. This article could serve a very important role in my paper as it could potentially outline ways where the school system can better prepare students throughout their undergraduate education such that students are less mentally distressed come their final year. This article is limited in that it bases its study on Turkey and the main focus groups of my research paper will be from the United States.

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