Jonathon Smith
10/24/2024
CS 470 Final Reflection
https://youtu.be/eztmQog5D1w

Final Reflection

Experiences and Strengths

What skills have you learned, developed, or mastered in this course to help you become a more marketable candidate in your career field?

This course was essential in understanding the process of getting our applications off our computers and available to users across the world. We learned how to take an application, containerize it, and deploy it to the cloud as well as understanding the pros and cons of cloud-based systems. At this point, I have now developed foundational skills at every level of development from design to deployment and most importantly, I've become comfortable with the unknown. I have been given the tools to understand the foundational concepts behind development and feel comfortable working with new tools and languages.

Describe your strengths as a software developer

I have a few key points that I consider my strengths in software development. First would be my ability to learn and adapt to new tools and languages. I feel very comfortable working with new languages as I believe the foundational understanding of what your code is doing is more important than syntax. Syntax can be learned or refreshed quickly.

Second, I think my creativity helps me in many aspects in the early stages of development or problem solving. Whether it's front-end design, new features, or solving a problem, I can leverage my creativity to think outside of the box to reach a solution. Lastly, I think the biggest piece that may be overlooked is my history in leadership and personal skills. The aspects of a career in this field that may be a challenge to some, are something that I bring to the table on day one. Fostering a strong culture is something that I have a proven history of. Participating/running meetings, accountability, planning, and many skills that are essential in the skills required outside of programming are aspects of this career that I am comfortable with and excited for.

Identify the types of roles you are prepared to assume in a new job

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It would be disingenuous of me to think that I could come into any role and perform at a high level immediately. With time and a strong team with a good culture, I think I have the foundational aspects to grow into any role very quickly. Although it is not a specific role, I would like any organization to put me in a role with the understanding that I want to be more than a developer in time. I want to be a leader, I want to foster culture, I want to leverage my experience to grow in the company and be a foundational piece to success.

Planning for Growth

How would you handle scale and error handling?

Scaling: Microservices offer the ability to scale individual components of your application independently. For instance, if a particular service faces increased demand, you can scale that microservice without scaling the entire application. Serverless functions scale automatically based on demand. You don't need to manage the infrastructure, and services like AWS Lambda automatically scale in response to traffic. This reduces overhead and simplifies scaling.

Error Handling: Since microservices are loosely coupled, failures in one service won't necessarily bring down the entire system. Implementing retries, circuit breakers, and fallback mechanisms can help isolate issues and improve overall fault tolerance. Proper logging and testing would also limit errors prior to deployment.

How would you predict the cost?

Predicting Cost: Serverless models are based on the "pay-as-you-go" model, meaning you only pay for the actual time your functions are running (execution time, memory used). This makes predicting cost easier for known workloads but trickier for highly variable traffic patterns. The best method to predict cost would be to analyze prior traffic patterns and develop an algorithm that considers growth and traffic history to predict future usage.

What is more cost predictable, containers or serverless?

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If the goal is to predict cost without factoring in overprovisioning, containers will be more predictable. With containers, you pay for the resources regardless of whether they are used at full capacity. This is easier to predict but certainly leads to wasted resources. Serverless has the opposite effect as your application scales to demand leading to less predictable cost. When factoring in the larger picture, reliability, scalability, and customer satisfaction, serverless makes offers a more complete solution. It's also important to consider business factors. If increased traffic results in increased revenue, the underlying cost increase should be compared to revenue growth. Instead of defining cost as a static dollar amount, it would be more beneficial to define it as a percentage of revenue to better understand profits/losses and determine what areas of the business need attention to increase revenue.

Explain several pros and cons that would be deciding factors in plans for expansion.

There are many factors that should be considered when planning for expansion. The needs of the infrastructure, the upfront cost vs. cost over time, the expected consumer experience, and accessibility requirements should all be factored into the plan for expansion. The conclusion may not always be one method, but a blend to maximize the pros and limit the cons of many methods.

The size, goals, and economics of the company would also play a large factor in this decision. A larger company may want to leverage a hybrid model of cloud and local services to take advantage of the scalability and flexibility of cloud services while also maintaining control over sensitive data and consistent access offered by a local infrastructure. A smaller company may use more third-party services to assist their business and would be more concerned with cost-saving and ease of a cloud platform. Having a firm understanding of the goal of the expansion and working with leaders to discuss requirements is key in determining an expansion plan.

What roles do elasticity and pay-for-service play in decision making for planned future growth?

Elasticity and pay-for-service play a large role in decision making for future growth. These two factors allow us to operate with an understanding that the customer experience and cost aspects of the decision will be handled appropriately. Knowing that there will be no wasted cost on unused resources while also ensuring a smooth customer experience is a pivotal component that offers certainty in crucial aspects of growth. Barring a highly regulated business, there are very few reasons a company should forego these benefits and implement a strictly local infrastructure if

they have a customer-facing business. I think it's crucial to take advantage of elasticity and pay-for-use when possible, with a hybrid model being the best of all options when factoring in only the pros and cons of the infrastructure.