Hello and thank you for your time.

**Next**

First, I must apologize to the assessor if my presentation is difficult to understand, I am currently full of seasonal sickness.

**Next**

**Next**

Hello, my name is Joshua Morton the date is the 12th of December, 2023, this presentation focuses on a client project I’ve worked on as a core software engineer over the past three months.

My elective module was Software Architecture, which was perfectly timed with this project as I actively contributed to architectural decisions we have since implemented.

**Next**

Our client in the aviation sector has been operating a Baggage Handling System (BHS).

Spanning multiple terminals, this mission critical system is the backbone of the entire airport, responsible for real time communication of faults, traffic spikes and other operational events.

This system had been in production for over a decade and the client was content, however it had some rough edges that needed to be addressed regarding hosting cost, ease of development and security concerns.

**Next**

I’ll give a brief technical overview of the system before delving into how my elective module directly correlated with the solutions we implemented.

Their immediate concern was their running costs.

Their infrastructure was on-premises, requiring a dedicated Network Engineering team.

In total, they spent over £200,000 annually on top-end hardware & maintenance as well as salaries.

Secondly, they had critical authentication and identity management failures stemming from past architectural decisions.

Each user logged in with the same Username and Password.

This was a fundamental security failure.

As the number of Stakeholders increased, so did the need for identity recognition.

Finally, the system was split into two distinct applications sharing a database, a website and a mobile app.

These were built with different technologies, all of which are now unsupported, wasting labor and resources on development and maintenance as changes had to be made in two different places.

**Next**

A key area of learning for me was cloud-based hosting architectures, I learned about their powerful website hosting services offering automatic horizontal & vertical scaling, load balancing,

As well as their continuous integration pipelines and authentication services – all at affordable prices when compared to the monumental task of implementing these in-house.

We chose Amazon Web Services often shortened to (AWS) as our service provider, utilizing Amplify for hosting & scaling.

Cognito for user account administration and application authentication

And finally Terraform for continuous integration and deployment.

All in all, costing approximately one quarter of the previous infrastructure costs.

**Next**

I invested time learning about various different system architectures, such as distributed microservices and clean monoliths

This research helped our team to design a clean and easily maintainable system to solve our clients challenges.

We adopted Jamstack architecture to implement the system itself, meaning one or many JavaScript Frontend’s served by a single Backend API.

Using a unified Microsoft .NET API, we were able to deduplicate all business logic for serving data to both our Website and Mobile application

This ensured that functionality was identical between both applications and vastly reducing the complexity of future feature development.

**Next**

**Next**

Task 2: 2 min 45 sec

As we progress, I'd like to employ Kolb's Experiential Learning Theory to reflect on the pivotal role my technical learning in Software Architecture played in our client’s project.

I chose Kolb's model for this reflection because it mirrors the cyclical nature of learning and applying in software development.

It provided a framework to not just apply my learning but to continuously adapt and improve upon it.

This reflection has been instrumental in recognizing the value of integrating academic knowledge with practical application.

My engagement with this project was deeply immersive.

I went through a mindset shift, it wasn’t just about upgrading an existing system as a team, we had to rethink, and reshape it to meet modern standards.

This was a leap from the theoretical knowledge I had acquired in my elective module and required a deep analysis to ensure my knowledge was to a high standard when the time came for architectural suggestions and implementation.

During my reflection phase, I focused on the broader implications of our technical challenges.

It wasn’t just about immediate fixes; it was about envisioning a system that was sustainable, secure, and forward-thinking.

This reflection guided my understanding of our project’s needs beyond its immediate challenges.

The concepts I learned about cloud architecture and scalable systems in my elective module re-shaped my view of the Software Development Lifecycle.

I began to see how these concepts could be tailored to not just address current issues but also anticipate future needs.

Experimentation led to the adoption of AWS for our project, a decision that came from understanding its potential through my research and reflection.

Our approach wasn’t just about solving problems; it was about innovating what was already there and delivering value to our client.

We didn’t only migrate to a cloud-based system; we reinvented the way the system functioned, making it more cohesive, efficient, and future-proofed.

**Next**

To wrap up, using Kolb’s reflective cycle has allowed me to see the intersection of academic knowledge and practical application not as a one-time event, but as a continuous process.

It has been fundamental in guiding our team to deliver a solution that was not only effective in the short term but also poised for future growth and challenges.

**Next**

**Next**

This next section will be split into four parts

skills and responsibilities acquired, professional development, cultural and individual responsibilities, and their impact on my job role.

**Next**

During my module, I acquired critical skills in cloud-based architectures and scalable systems, directly applicable to our client's Baggage Handling System.

My responsibilities grew from simply coding to making key architectural decisions.

This shift required not only technical skill development, but also a strategic mindset and effective communication abilities.

I learned to analyze and design systems considering factors like cost, security, and maintainability.

These skills were crucial when we decided to migrate to AWS, requiring a deep understanding of various services like Amplify, Cognito, and Terraform.

**Next**

This project marked a significant leap in my professional development.

I evolved from a just an implementer to a critical thinker and decision-maker, able to contrinbute to vital architectural changes.

The module's emphasis on modern cloud solutions and scalable system designs equipped me with the knowledge to propose and implement the Jamstack architecture powered by Cloud Services.

My team and I wouldn’t have been able to implement as clean of a solution without this deep analysis and reflection.

This project and module have contributed to my role expanding beyond just technical execution to encompass business analysis and project leadership, guiding the team through complex architectural considerations.

**Next**

In terms of cultural and individual responsibilities, the project underscored the importance of adapting to and respecting diverse perspectives within our team and client interactions.

Embracing these cultural dynamics enriched our collaborative efforts, leading to more innovative solutions.

Individually, I recognized the significance of legal and ethical considerations, especially in handling sensitive data in the aviation sector.

Upholding security standards and ensuring system reliability has become paramount in my daily responsibilities.

**Next**

The technical and soft skills acquired enabled me to contribute effectively to a mission-critical system, enhancing not just the technical framework but also the security and operational efficiency of the BHS and I can confidently say future projects as well.

Culturally, fostering an inclusive and respectful work environment has led to a more cohesive team, capable of tackling complex challenges innovatively.

This holistic development has not only solidified my role as a software engineer but also as a key player in driving forward-looking solutions in our organization.

**Next**

Thank you for your time, this concludes my Presentation.

**Next**

End