SWINBURNE VIETNAM

HO CHI MINH CAMPUS

Industry Practice Guest Lecturer Report

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Introduction

This report summarizes four insightful guest lectures that explored various aspects of the software industry. The talks covered topics such as software deployment and evolution, software testing in the age of automation, cloud computing in AI development, and Agile methodologies in modern software development. Each lecture provided valuable insights into contemporary practices, tools, and methodologies in the software industry.

Report 1

Topic: Software Deployment and Evolution
Speaker: Mr. Hai Tran
Lecture day: 14th July
Prepared by: AWS
Student id: 104175779

This week marked the conclusion of our guest lecture series on software deployment and evolution, featuring a detailed presentation by Mr. Hai - currently employed as a Technical Account Manager at AWS Vietnam, he provided us with a comprehensive look into the practical applications of software deployment principles, particularly in the context of managing one of the UK's largest trading platforms.

The lecture began with an introduction to Mr. Hai's professional background and the operational scale of his company. With billions of pounds managed through their trading platform, the company's role in the financial sector underscores the critical nature of their software deployment practices. This context set the stage for an exploration of how theoretical concepts are applied in high-stakes real-world scenarios.

A key theme of the lecture was the evolving role of software deployment. Traditionally a final step, Mr. Hai emphasized that deployment is now part of an iterative cycle involving constant updates and feedback. This shift reflects a broader industry trend where deployment is an ongoing aspect of software maintenance and evolution, linked to DevOps principles. He highlighted the importance of making deployment processes repeatable and reliable for both end users and development teams.

Mr. Hai discussed the challenges and strategies for managing change and maintaining software quality. Modern practices like Agile and CI/CD are designed to handle change effectively. He stressed rigorous testing to address discrepancies between development and production environments.

The lecture also covered working with legacy systems. Mr. Hai shared a case study of his company's 25-year-old trading platform, which required migrating from Foxpro databases to Postgres to handle increased data complexity. He emphasized the need for robust automation and repeatability in deployment and detailed his company's iterative workflow for managing change requests, including tools like Git, Jira, SonarQube, Rundeck, and PgBadger.

Relevance to Unit Learning Outcomes (ULOs)

- **Activities in Software Deployment:** By detailing the deployment tasks at his company, Mr. Hai Tran provided a clear understanding of how these activities apply in a real-world context.
- **Knowledge of Software Environments:** The discussion on planning and managing software environments emphasized the importance of automation in reducing variability and ensuring consistency.
- **Issues Driving Software Maintenance:** Mr. Hai Tran's focus on testing and quality assurance highlighted common maintenance issues and strategies for addressing them.
- **Latest Practices in Software Development:** The introduction of various tools and practices illustrated current industry trends and their practical applications.
- **Maintainability and Design Consistency:** The emphasis on automation and iterative workflows underscored the importance of maintaining design consistency and system reliability.

In conclusion, Mr. Hai's lecture provided a valuable perspective on the integration of software deployment practices within a high-impact environment. His insights into automation, testing, and workflow management offered a practical understanding of how these principles are applied to manage complex systems and ensure ongoing reliability.

Report 2

Topic: Software Testing in the Age of Automation
Speaker: Dr. Tuan Tran
Lecture day: 6th July
Prepared by: Swinburne Academic Department
Student id: 104175779

This week's guest lecture by Dr. Tuan, titled "Software Testing in the Age of Automation," provided valuable insights into the impact of automation on software testing. With over 15 years of experience, Dr. Tuan highlighted how automation is reshaping software testing, making it more efficient and reliable.

He began by discussing the evolution from traditional manual testing, which struggles to keep pace with modern development cycles and complex systems. Automated testing, he noted, is essential for maintaining high-quality software in today's fast-paced industry.

Dr. Tuan explained that automation enhances test coverage by executing extensive and repetitive tests, which are impractical manually. It ensures comprehensive validation by running numerous scenarios and reduces human error, crucial for regression testing. He outlined various automated tests: unit tests for individual components, integration tests for component interactions, and end-to-end tests for verifying the entire system. He stressed the importance of a balanced testing strategy incorporating all three types.

Dr. Tuan also covered key tools and frameworks, including Selenium for web testing, JUnit and NUnit for unit tests, and Jenkins for CI/CD. He shared practical examples showing how these tools streamline testing and improve quality, with CI/CD pipelines validating new code before it reaches production. While acknowledging the initial investment required for setting up and maintaining an automated test suite, Dr. Tuan emphasized that the long-term benefits, such as time savings and increased confidence in code changes, outweigh these costs. He concluded with a Q&A, advocating for a hybrid approach that combines automated and manual testing for optimal results.

Relevance to Unit Learning Outcomes (ULOs)

- **Enhanced Test Coverage and Accuracy**: Automated testing significantly improves test coverage and accuracy, allowing development teams to catch more issues earlier in the development process.
- **Integration with CI/CD Pipelines**: Integrating automated testing with CI/CD pipelines ensures continuous validation of code changes, enhancing the reliability of software releases.
- **Balanced Testing Strategies**: Employing a mix of unit, integration, and end-to-end tests ensures comprehensive validation of software components and their interactions.
- **Tool Utilization**: Utilizing tools like Selenium, JUnit, NUnit, and Jenkins streamlines the testing process and supports the implementation of automated testing practices.
- **Addressing Testing Challenges**: Acknowledging and addressing the challenges of automated testing, such as initial setup and maintenance efforts, is crucial for realizing its long-term benefits.

Al in all, the guest lecture by Dr. Tuan on "Software Testing in the Age of Automation" provided valuable insights into the transformative role of automation in modern software testing. By highlighting the benefits, tools, and integration strategies of automated testing, the speaker showcased how development teams can enhance their testing practices to ensure high-quality software.

Report 3

Topic: Cloud Computing in the Development of AI
Speaker: Dr. Minh Nguyen
Lecture day: 21st June
Prepared by: Swinburne Academic Department
Student id: 104175779

This week's guest lecture, delivered by Dr. Minh Nguyen, focused on the compelling intersection of cloud computing and artificial intelligence (AI). Titled "Cloud Computing in the Development of AI," the lecture provided profound insights into how cloud infrastructure is revolutionizing AI development, making it more accessible, scalable, and efficient.

Dr. Minh began by exploring the historical evolution of cloud computing and AI. He noted that traditional AI development required substantial computational resources, often beyond the reach of many organizations. Cloud computing has democratized access to these resources, making it feasible for a wider range of entities to engage in AI research and development.

A major theme was the synergy between cloud computing and AI. Dr. Minh emphasized that cloud computing offers the infrastructure needed for AI, including scalable storage, high-performance computing (HPC), and advanced development tools. This infrastructure allows organizations to scale AI projects quickly without large upfront hardware investments. Dr. Minh highlighted several key benefits of cloud computing for AI development, including scalability and collaboration. He discussed various cloud platforms tailored for AI, including AWS, Google Cloud Platform (GCP), and Microsoft Azure. These platforms offer tools and services that streamline the AI workflow, from data processing and model training to deployment. Services like AWS SageMaker, Google AI Platform, and Azure Machine Learning reduce setup time and complexity.

Dr. Minh also covered the role of cloud computing in managing and processing large datasets. Cloud-based storage solutions like Amazon S3 and Google Cloud Storage provide scalable, cost-effective data storage, while tools like Apache Spark and Google BigQuery enable efficient data analysis.

Lastly, he addressed security and compliance in cloud-based AI development. Cloud providers invest in robust security measures and ensure compliance with regulations such as GDPR and HIPAA, offering a secure framework for handling sensitive data in AI projects.

Relevance to Unit Learning Outcomes (ULOs)

- **Understanding Cloud Computing Activities in AI Development**: Dr. Minh demonstrated how cloud platforms like AWS SageMaker and Google AI Platform facilitate AI model deployment, showing their direct application to AI development and real-world problem-solving.
- **Planning Development and Deployment Using Cloud Environments**: He detailed the use of cloud environments for planning and deploying AI projects, emphasizing scalable infrastructure and rapid resource management.
- **Identifying and Managing Issues in AI Development**: Dr. Minh discussed common AI issues, such as large dataset management and data security, explaining how cloud services address these challenges with automated backups, encryption, and compliance monitoring.
- **Exploring Latest Practices in AI Development Using Cloud Technologies**: The lecture covered advanced practices, including cloud-based tools for CI/CD, illustrating how these are used to streamline AI development and deployment.
- **Evaluating Maintainability and Design Consistency of AI Systems**: Dr. Minh shared best practices for maintaining consistency and integrity in AI systems, highlighting automated testing, version control, and security measures supported by cloud platform

To summarize, Dr. Minh Nguyen's lecture on "Cloud Computing in the Development of AI" provided valuable insights into how cloud infrastructure is transforming AI development. By showcasing the benefits, tools, and best practices of cloud computing for AI projects, Dr. Minh effectively bridged the gap between theoretical concepts and practical application, enhancing understanding of both academic and industry practices.

Report 4

Topic: Agile Methodologies in Modern Software Development.
Speaker: Dr. Jorge Martinez
Lecture day: 20th July
Prepared by: Swinburne Academic Department
Student id: 104175779

This week's guest lecture was delivered by Dr. Jorge Martinez and focused on "The Role of Agile Methodologies in Modern Software Development." The lecture provided deep insights into how Agile methodologies have transformed the software industry by promoting flexibility, collaboration, and customer-centric development processes.

Dr. Martinez began by discussing the origins of Agile methodologies, tracing them back to the early 2000s with the creation of the Agile Manifesto. Agile was developed in response to the shortcomings of traditional waterfall models, which often led to delays and mismatches between the final product and customer expectations. Agile methodologies aim to deliver small, usable segments of software frequently, allowing for continuous feedback and adaptation.

A significant theme of the lecture was the emphasis on collaboration and communication in Agile teams. Dr. Martinez stressed that Agile prioritizes individuals and interactions over processes and tools. Dr. Martinez detailed key practices of Agile methodologies, including Scrum, Kanban, and Extreme Programming (XP). Scrum is used for managing complex software projects with fixed-length sprints and roles such as Scrum Master and Product Owner. Kanban focuses on visualizing workflow and limiting work in progress to improve efficiency. XP emphasizes technical excellence and continuous improvement through practices like pair programming and test-driven development (TDD). The lecture also covered the role of Agile in enhancing customer satisfaction. Agile encourages frequent delivery of working software, allowing customers to provide feedback early and often. This iterative process ensures the final product meets customer needs and adapts to changing requirements. Dr. Martinez illustrated this with a case study where an Agile approach led to a successful project turnaround by involving the customer at every development stage.

The speaker finished the talk by mentioning the adaptability in Agile. Dr. Martinez emphasized that one of Agile's core principles is to embrace change, even late in the development process. Agile teams are equipped to respond to changing market conditions and customer requirements, making them more resilient and competitive. This adaptability is achieved through short development cycles, continuous integration, and regular feedback loops.

Relevance to Unit Learning Outcomes (ULOs)

- **Understanding and Applying Agile Practices**: Dr. Martinez provided an in-depth look at Agile methodologies like Scrum, Kanban, and XP, showing their application in real-world projects. This aligns with the goal of understanding and applying Agile practices to enhance software development.
- **Planning and Managing Agile Projects**: He discussed key Agile practices such as sprint planning, daily stand-ups, and retrospectives, offering insights into effective project management and continuous improvement.

- **Identifying and Overcoming Challenges**: The lecture covered common challenges in Agile implementation, particularly in large organizations, and provided strategies for overcoming these obstacles.
- **Enhancing Customer Satisfaction**: Dr. Martinez highlighted how Agile methodologies improve customer satisfaction through customer involvement and incremental delivery, aligning with goals to enhance satisfaction in software projects.
- **Adapting to Changes and Ensuring Resilience**: He emphasized adaptability and resilience in Agile practices, demonstrating how Agile teams can handle changes and ensure project success, crucial for developing a resilient approach to software development.

To conclude, Dr. Jorge Martinez's lecture on "The Role of Agile Methodologies in Modern Software Development" offered valuable insights into how Agile practices are reshaping the software industry. By exploring the benefits, challenges, and best practices of Agile methodologies, Dr. Martinez demonstrated how organizations can use Agile principles to enhance development processes, boost customer satisfaction, and promote a collaborative and adaptable work environment.

Summary

The guest lecture series on software deployment and evolution covered several key topics: The first lecture introduced the evolving role of software deployment, emphasizing its integration into an iterative development cycle through DevOps principles and continuous updates. The second talk focused on managing software quality and change, highlighting Agile and CI/CD practices, rigorous testing, and the importance of aligning development environments with production to address common issues. The third lecture explored the challenges of working with legacy systems, using a case study of a 25-year-old trading platform to illustrate the complexities of updating outdated systems and the necessity of automation and repeatability. The final lecture addressed automation and workflow management, detailing a structured approach to change requests and the use of tools like Git, Jira, SonarQube, Rundeck, and PgBadger to support efficient and reliable deployment processes.