Section 1 - Explain the Fundamentals and Benefits of CI/CD to Achieve, Build, and Deploy Automation for Cloud-Based Software Products

Why CI/CD

To meet market demands

In today's business, high-quality and sophisticated application development is required. As system development becomes more complex, the demand for development, deployment frequency, and speed is increasing in order to quickly follow market changes, and agile development is accelerating.

Also, unlike the times when the WEB was composed of HTML and a small amount of JavaScript, advanced frameworks such as React appeared and business logic was given to the front end, so the load of development and testing on the front end side was high.

In agile development, how quickly you can test and release changes and get feedback is key to success and is in line with CI/CD policies. The demand for CI/CD, which supports agile development of sophisticated systems, is rapidly increasing.

Why CI/CD

Evolution of technology supports CI/CD

The evolution of container technology and cloud technology such as Docker and Kubernetes supports this as a technology that accelerates CI/CD. Infrastructure as code makes it surprisingly accurate and easy to build an environment and deploy to a production environment.

By automating tasks such as releasing changes that pass the test and rolling back if there are bugs, it is now possible to efficiently deploy.

There are various CI/CD tools, and anyone can use the automation and monitoring environment from development to operation.

Business value

In addition to improving quality, it reduces the time and loss required for communication related to conventional system development and operation, and enables operations with a limited number of people and time, which has a great effect on cost reduction and profit.

Technical aspects	Value	Business Value
Catch Compile Errors After Merge	Reduce Cost	Less developer time on issues from new developer code
Catch Unit Test Failures	Avoid Cost	Less bugs in production and less time in testing
Detect Security Vulnerabilities	Avoid Cost	Prevent embarrassing or costly security holes
Automate Infrastructure Creation	Avoid Cost	Less human error, Faster deployments
Automate Infrastructure Cleanup	Reduce Cost	Less infrastructure costs from unused resources
Faster and More Frequent Production Deployments	Increase Revenue	New value-generating features released more quickly
Deploy to Production Without Manual Checks	Increase Revenue	Less time to market
Automated Smoke Tests	Protect Revenue	Reduced downtime from a deploy-related crash or major bug
Automated Rollback Triggered by Job Failure	Protect Revenue	Quick undo to return production to working state

Conclusion

CI/CD is

- An indispensable method for applications that support today's business. The technology that supports this is mature and anyone can use it.
- Beyond the success of CI/CD, it will change the conventional wisdom of system development and operation, and will dramatically improve the cost and quality of applications, and will be the driving force for business success.