

Developing *Social Mobile Learning* Application on Android Platform



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Evolution of Smartphone



The evolution of smart phone and social media encourages mobile learning application transformation towards mobile social learning



Evolution of Smartphone



Mobile technology user has increased three times in 2008 and it is projected to reach 89 million in 2008, and 100 million in 2012. In 2015, China, India, and Indonesia will have the most mobile learning user after USA.



Today, smartphone has various platforms, such as Java Android, Symbian, Bada, iOS, and Windows Phone.

Evolution of Smartphone



Android becomes the leader of smartphone in the world today. In Indonesia Android has 52% market share in second quarter.



Learning Paradigm



Learning concept which is currently teacher centric has been shifted to the new paradigm in which learners can participate in developing learning process and content.

Learning Content Generations

Learners Communication

Social Mobile Learning

Social Mobile Learning = e-Learning 2.0

The Key Feature

Collaboration

Information

Content
Sharing

Integration

Social Mobile Learning



- In many years, learning model which is used is face to face in class, with one way conversation from the teacher to student.
- Most e-Learning today just automates that process.
- The difference is only that in e-Learning, the teacher and student do not need to stay in the same place at the same time.



Social Mobile Learning

Cross (2003) stated that learning process often happen in informal situation, such as observation on someone else, asking to peer, calling help desk, trial and error, or cooperate with someone else in understanding the material.

Social Software Approach



Natural Characteristic of Learning

Social	Personal
Distirbuted	Flexible
Dynamic	Complex

Social software approach gives several advantages for online learning in compared with traditional approach.

Besides, this approach represents the shift of learning management system model to be more social, personal, open, and dynamic.

Social Network Collaboration



Social network collaboration creates online communities and mobility to be favorable delivery channel, not only to improve return on investment, but also to expand the global coverage and improve operational efficiency of workers in company or institution

E-Learning 2.0



Social software implementation inspires development of new e-Learning generation, called e-Learning 2.0, featuring:

Social or collaborative learning Environment

Learning is about generating course contents and communicating with people.

Aggregating (RSS) and tagging

Knowledge sharing

Personalization

Collective intelligence (wisdom of the crowd)

Network usage with various technology.



Research Objective

The research objective is defined as learning management system enhancement featuring mobile social learning based on Android technology and Java Technology.



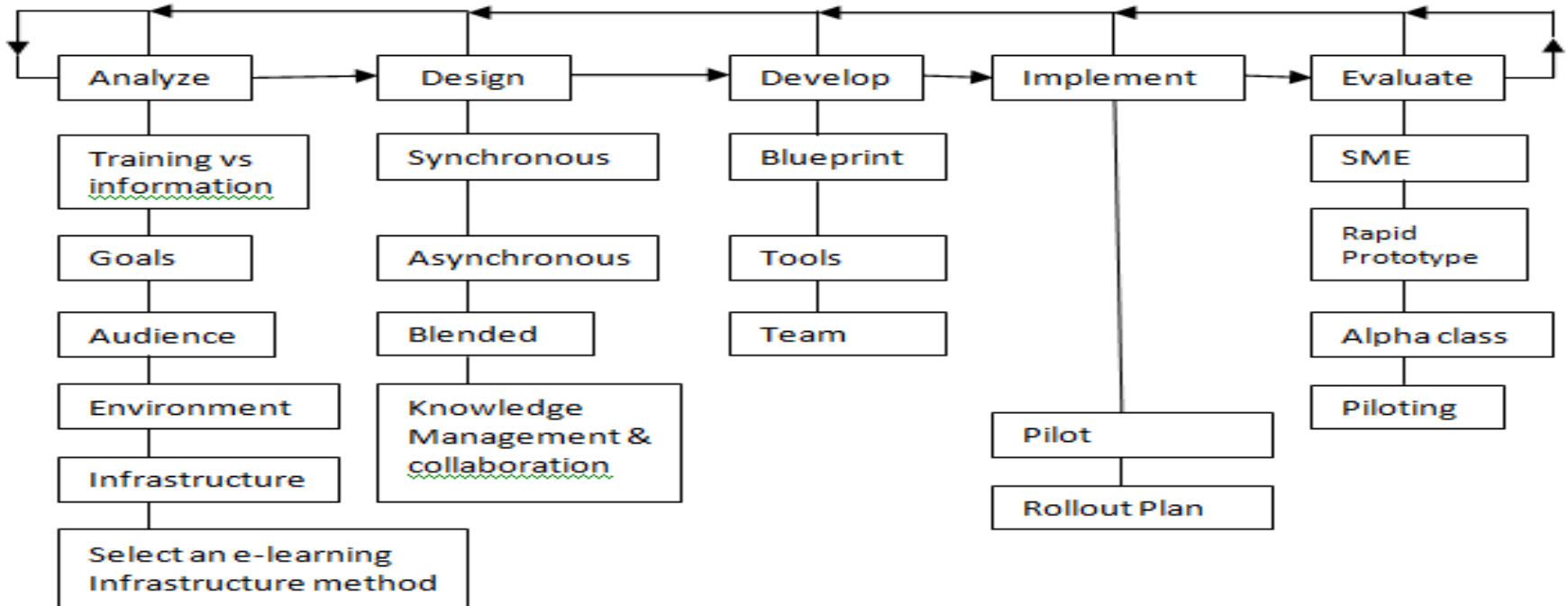
Research Methodology



This research uses ADDIE instructional design model. As mentioned from its name, ADDIE defines five steps, those are analysis, design, development, implementation, and evaluation.



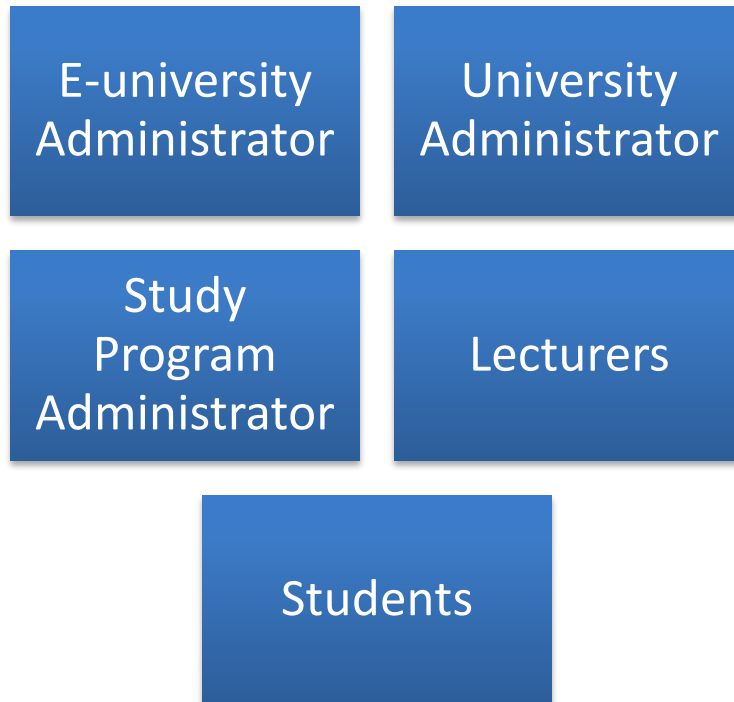
Research Methodology





M-Learning 2.0

- Mobile learning design refers to National E-Learning eXchange Technology (NEXT)
- The concept is about a mechanism to learn from various sources, not just focused on reference given by teachers. This mechanism is called multisourcing concept.
- The NEXT is in line with e-University concept

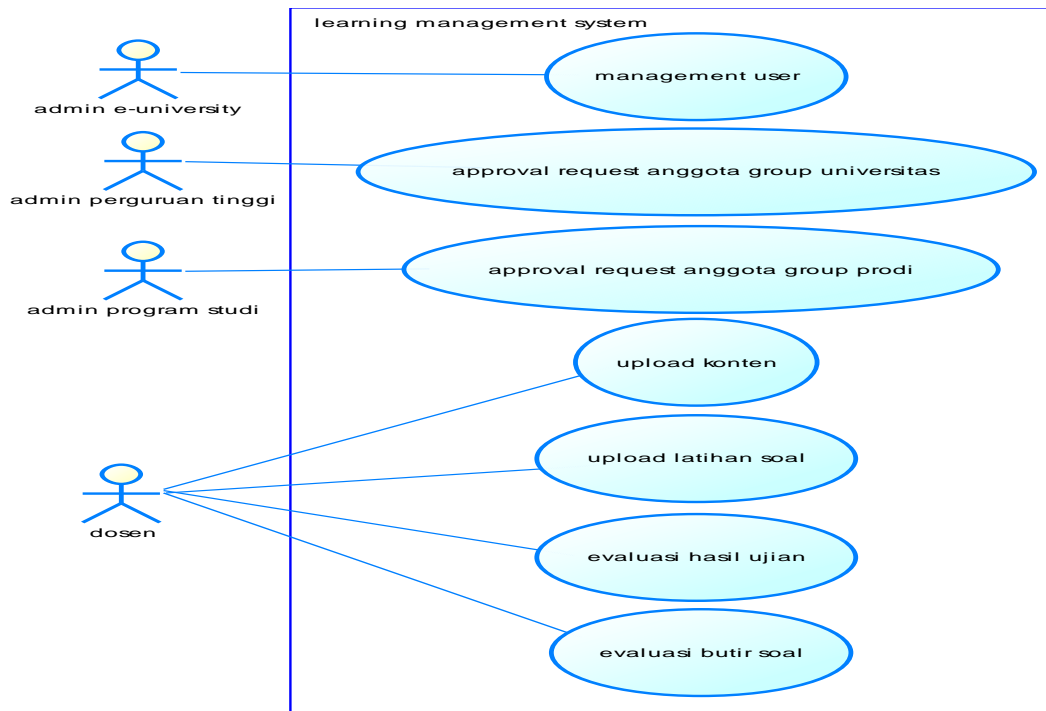


Usecase Diagram

Learning management system application has four actors such as e-university administrator, university administrator, study program administrator, lecturers, and students.

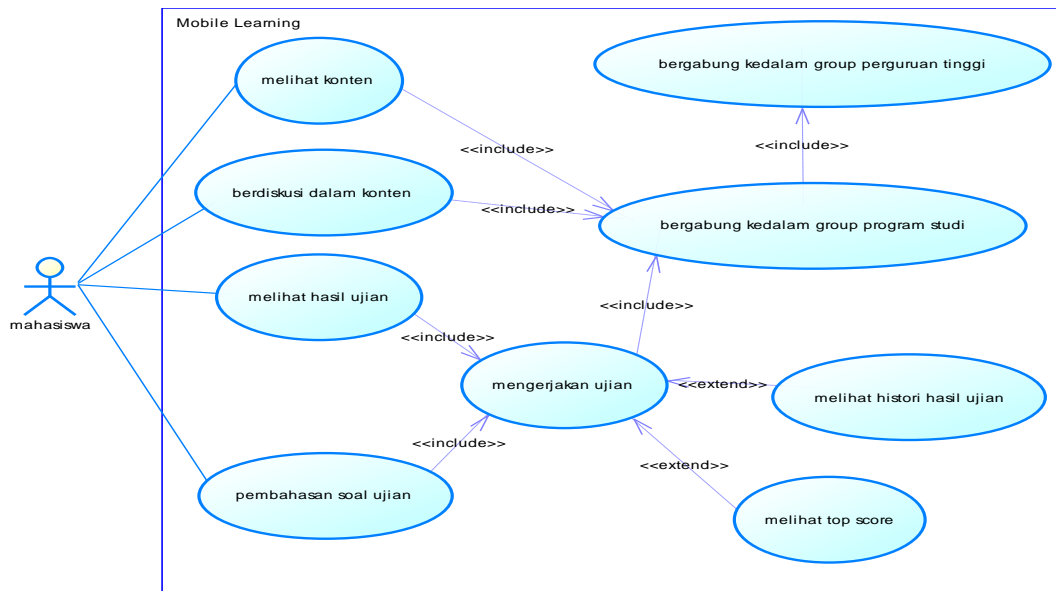
On the other hand, mobile learning application has students and lecturers as the only actor.

Use Case Diagram



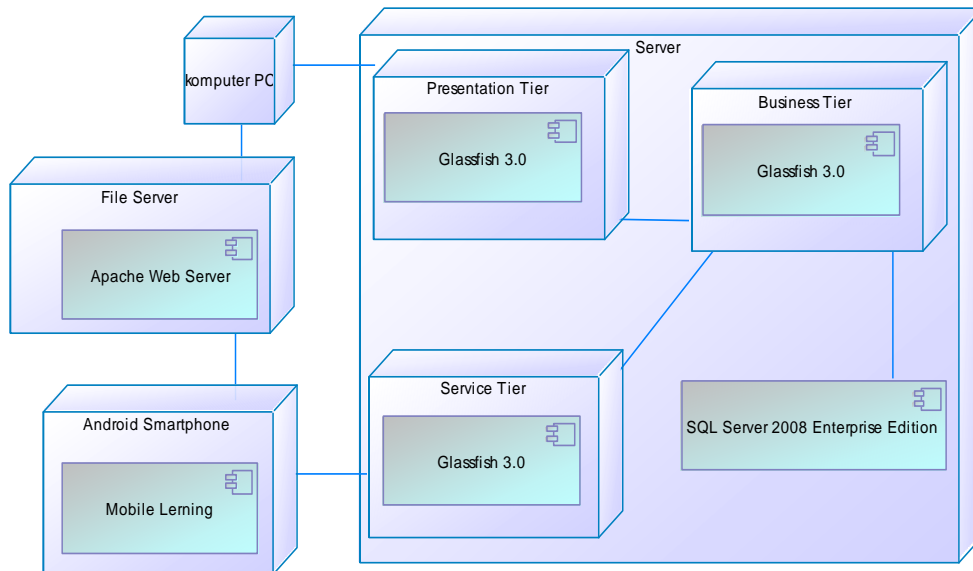
E-University administrator is the highest role in system which is designed to manage user list in the system such as changing role users, making a new user, and determining university administrator.

Use Case Diagram



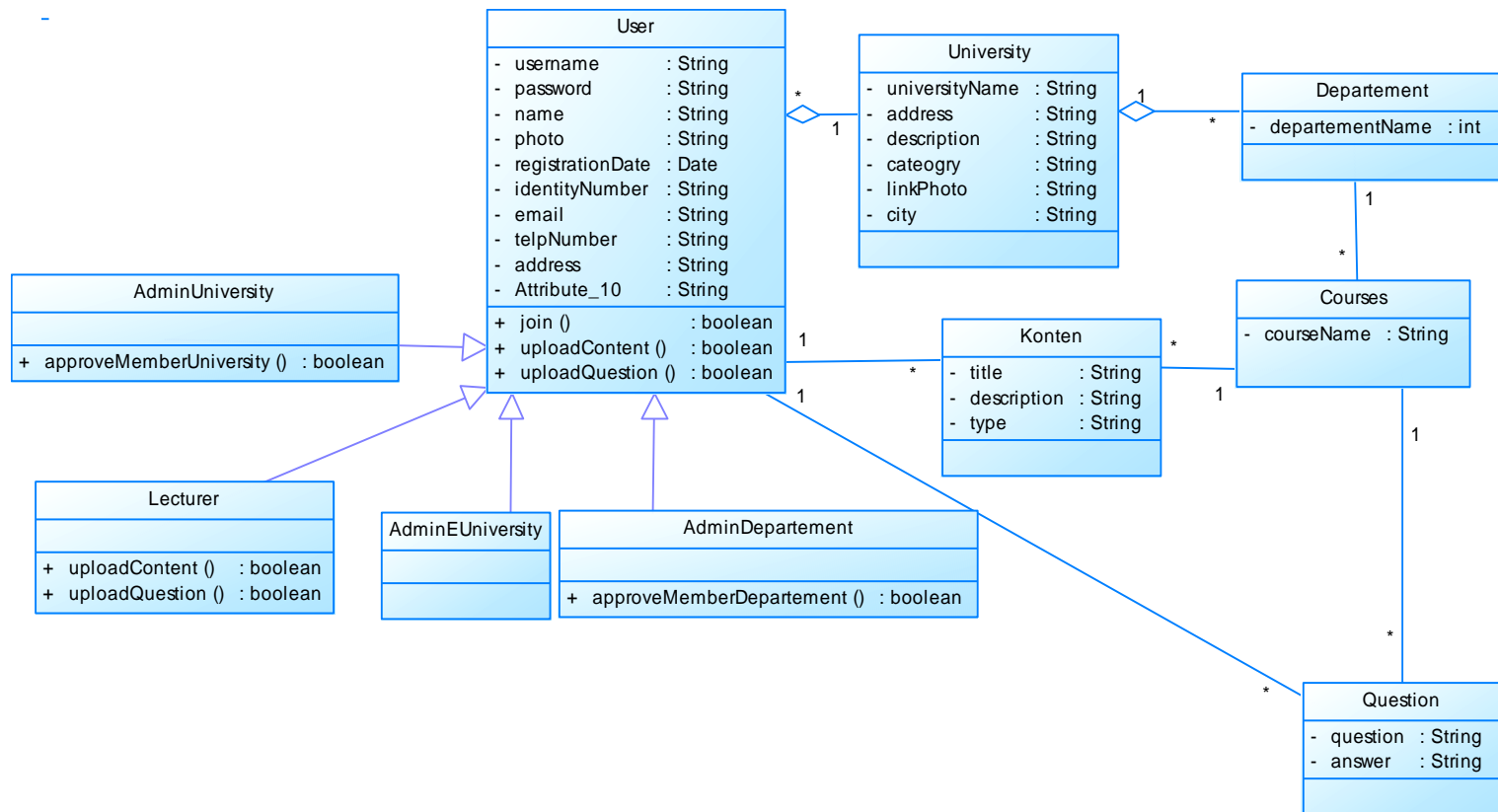
To initiate learning process, the students should join in university group then join in study program. The students could view the multimedia content, discuss in the multimedia contents uploaded by themselves, other students, or lecturers. Students also can do on-line quiz and exam.

System Architecture

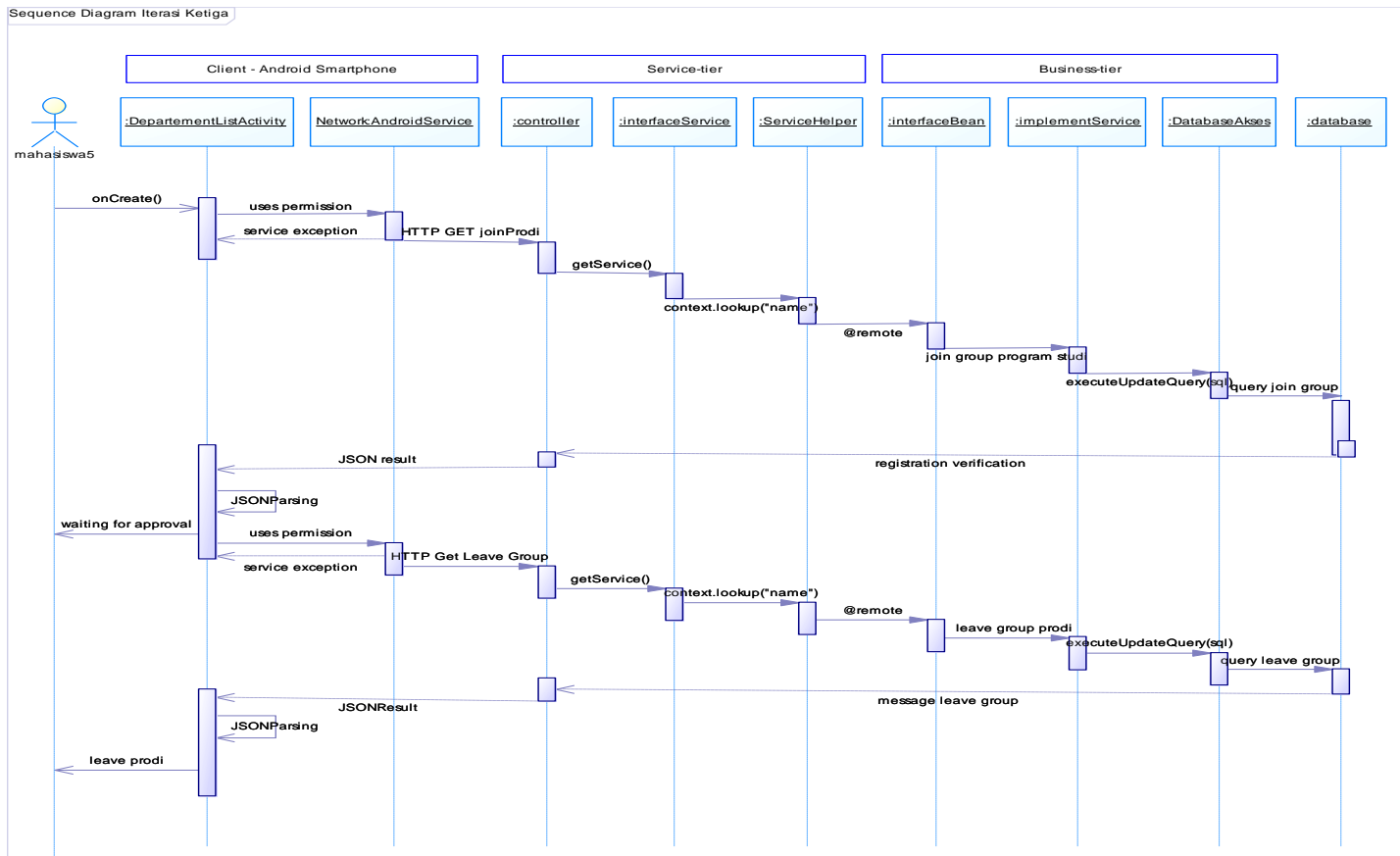


Architecture of mobile learning system implements multitier architecture by separating system into four main tiers that are service tier, presentation tier, business logic tier, and data tier.

Sequence Diagram



System Class Interaction



System Deployment



Specification For Server :

- Processor Intel Xeon CPU E3-1230 V2 3.30 GHz (*CPUs) ~3.3GHz
- Harddisk Drive 1TB
- OS : Windows Server 2008 Enterprise R1 x64 Edition
- RAM 16 GB



Specification For Mobile Learning Application :

- Android 4.0 Ice Cream Sandwich
- 1GHz Processor (ARM Cortex-A8)
- 1GB RAM
- 7 inch TFT LED (1024 × 600) Capacitive Multitouch Screen
- Internal Storage 4GB Nand Flash
- Wifi 802.11b/g/n
- Bluetooth 2.1
- Adobe Flash Player ver 10.3

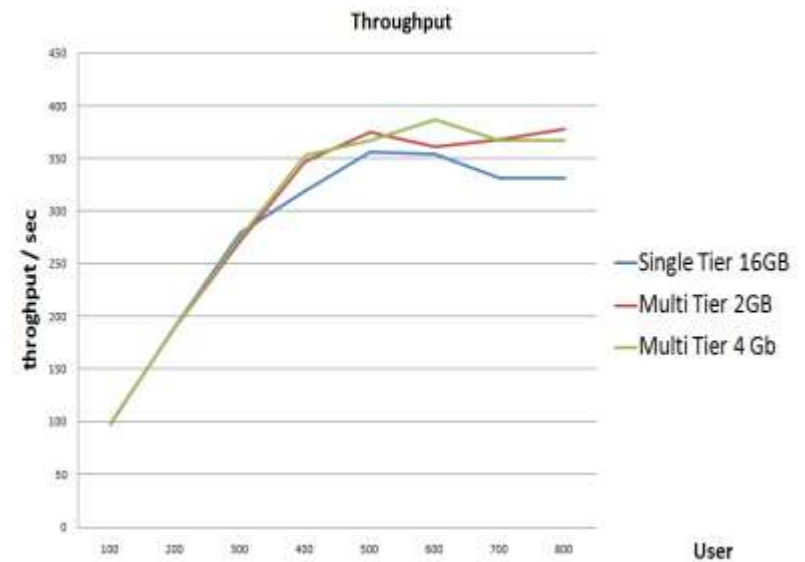
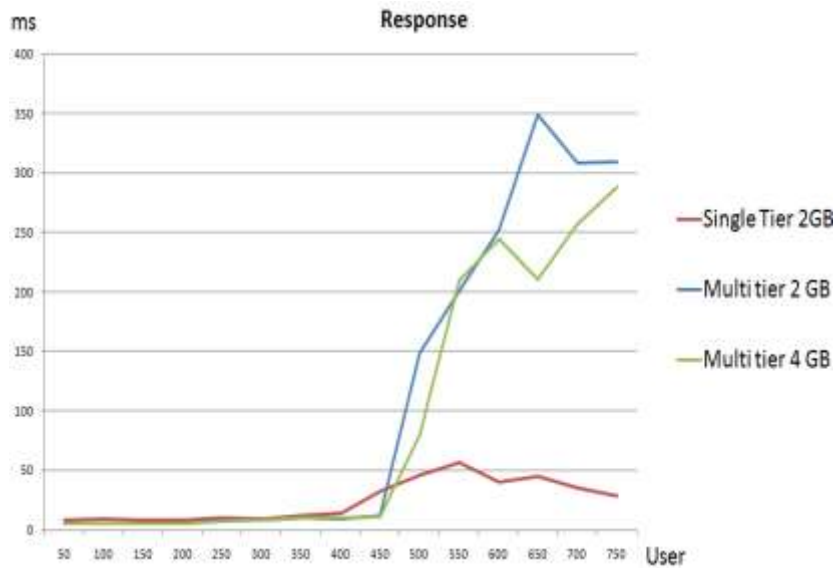
System Deployment



System Deployment



System Testing



System Testing

The implementation of both multitier and single-tier services is designed on campus intranet.

For this time, campus intranet is built on both copper cable and fiber optic.

On an intranet segment, measurement of experiment resulted average of intranet speed is 25 ms, in peak time. It uses 25 ms as average network time.

User access is defined on local user. Local user accesses application service on LAN media without proxy server. Local user accessed both single-tier and multitier application model. The number of user is modeled 1000 users (most number). It simultaneously accessed application services.

Conclusion

There are two applications that are built in this research, learning management system and mobile learning.

Java Enterprise Edition technology is implemented on Learning management system, whereas Java Android on mobile device.

A social learning is implemented by featuring university grouping, study program grouping, and discussion or collaboration among users in developing learning contents.

Further research should be conducted to develop more powerful system such as code refactoring, architecture enhancement, and additional features development such as personal space (RSS Feed, e-Portfolio, and personal blog), and collaboration or communication space (course blog, course wiki, bookmarking, messaging, content sharing, podcasting, social network, mobile conference, and mashup).