Course Project of Software Architecture

School of Software Engineering, Beijing Jiaotong University
Ergude Bao

1. Topic

A company is going to develop a Metaverse system. The system has the following major function: a user can live in the Metaverse, and a system manager can manage the Metaverse and users. The first function is achieved by a Metaverse living subsystem, and the second function is by a Metaverse management subsystem. The two subsystems have the following requirements.

(1) Metaverse living subsystem

A. The user can walk in the Metaverse and chat and play with other users.

B. The user can buy building blocks (such as bricks, windows and doors) from shopping malls.

C. To make payment, the user can use WeChat pay or Ali pay.

D. The user can use the bought building blocks to build his/her home.

E. The user can also earn credits by playing and winning in games.

F. Based on the earned credits, the user can be allowed to play some advanced games.

G. The user can easily learn how to use the system following instruction or guidance.

(2) Metaverse management subsystem

A. The manager can add or delete objects (such as shopping malls, homes, roads and parks) in the Metaverse.

B. The manager can also change appearance of the objects.

C. The manger can be notified before holidays or some specific time to make such changes.

D. The manager can iterate over all the users and see statistics of each user, such as track, payment history and relationship with other users.

E. The manager can warn or ban a user for some time if the user is doing something illegal.

F. The manager can change any object in the Metaverse within 1 second.

G. If the manager makes any incorrect changes, he/she can roll back the changes.

2. TODOs

(1) Write about WHAT quality attributes the whole system require ACCORDING TO THE DESCRIPTIONS ABOVE, and also WHAT is the possible architectural style

A. With quality attribute scenarios,

B. With an architectural graph, and

C. With necessary explanations.

(2) Write about WHAT design patterns are needed ACCORDING TO THE DESCRIPTIONS ABOVE, and WHAT architectural view models should be used

A. With UML diagrams, and

B. With necessary explanations.

(3) Write about WHAT design principles are there CORRESPONDING TO THE DESIGN PATTERNS ABOVE

A. With necessary explanations.

3. Deadline

Please hand-in the report in last class of this course. The report can be printed from an electronic file, or directly written in paper.

4. Grading

Full grade is 40 with TODOs (1) 15 points, (2) 15 points and (3) 10 points. Note:

(1) Each day's delay for submission will result in 5 points off;

(2) Not writing name and student ID will result in 5 points off;

(3) Any report copied fully or partially from papers, books or websites will be graded 0 directly;

(4) Any report fully or partially similar to another will be graded 0 directly.