Novel Examination Scenarios for U-Learning using Characteristic Diagrams

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Abstract

Research on implementing several projects and proposals of U learning are carried out for the past 10 years. The methods for learning are changing according to the novel inventions in the both hardware and software methods. One such method we concentrate in this paper is novel examination scenarios' where the participant need not physically appeared the examination but can write the test / present a seminar/ evaluate a test paper / submit the feedback / participate in a quiz etc remotely either login in their laptops or through their android. In this paper we concentrated on developing these U learning applications using a new approach called characteristicUML. We proposed a some Characteristics which help designers in developing these scenarios and enable the Teachers / Researchers / Students to login remotely, download the content, submit the seminars/projects/assignments, actively participate in webinars, test forums etc either through their local desktop or androids.

Keywords: U Learning, UML, DAG

1. Introduction

U Learning (e Learning + M Learning) is for learners to remotely access the class room and avail all the facilities like any learner physically available in the class room. M-learning focuses on the mobility of the learner, interacting with portable technologies, and learning that reflects a focus on how society and its institutions can accommodate and support an increasingly mobile population. M-learning is convenient in that it is accessible from virtually anywhere. M-Learning, like other forms of E-learning, is also collaborative; sharing is almost instantaneous among everyone using the same content, which leads to the reception of instant feedback and tips. M-Learning also brings strong portability by replacing books and notes with small RAMs, filled with tailored learning contents.

Tattersall, C., Vogten, H., Brouns, F., Koper, R., van Rosmalen, P., Sloep, P., & van Bruggen, J.discusses on how to create flexible runtime delivery of distance learning courses. Tai Honn Kim,Seok Soo Kim, Mion Seong Ju studied on U Learning Model for Ubiquitous environment. Joung-Souk Sung studied on a U-Learning Model Design Based on Ubiquitous Environment. Hye-jin Kim presented a review of the Recent Technological Developments for Determining the Current and Near Future Directions of u-Learning - Considering Security. Z.

Cheng, S. Shengguo, M. Kansen, T. Huang, & H. Aiguo discussed on a Personalized Ubiquitous Education Support Environment by Comparing Learning Instructional. Dougiamas, M., & Taylor, P. C. studied on Moodle and to use Learning Communities to Create an Open Source Course Management System. S. J. H. Yang studied on a context Aware Ubiquitous Learning Environments for Peer-to-Peer Collaborative Learning.

2. Characteristic Diagrams

The proposed Characteristic diagrams is a general Directed acyclic graph[1] which adopts the UML modeling concepts like UML diagrams, the common extension mechanisms in it.

The Unified Modeling Language (UML) is a visual modeling language for specification, visualization, construction, and documentation of virtually any kind of system where objects play a major role, whereas the focus of the UML lies clearly on supporting the software engineering process by modeling of object-oriented software systems.

DAG is a directed graph with no directed cycles. It is formed by a collection of vertices and directed edges, each edge connecting one vertex to another, such that there is no way to start at some vertex v and follow a sequence of edges that eventually loops back to v again.

Every directed acyclic graph has a topological ordering, an ordering of the vertices such that the starting endpoint of every edge occurs earlier in the ordering than the ending endpoint of the edge. A directed graph may be used to represent a network of processing elements; in this formulation, data enters a processing element through its incoming edges and leaves the element through its outgoing edges.

3. Characteristic Packages

A package is a set of characteristic diagrams and the characteristic is identified through its Name, Description, Properties, Structure, and dependency diagram. The structure is a simple characteristic diagram where each characteristic element is mapped to a class in a class diagram using UML. Each package is a set of characteristic and the relationships between them. Some of the characteristic packages discussed in this paper meant only for Examination scenarios in designing a course for U Learning are

Some of the characteristic packages used in our Characteristic model are

1. The Assessment package defines a method of collecting material, review the materials collected and assess participants' achievement for the purpose of improving learning and development of each participant. Hence this assessment characteristic can be described by a set of other characteristic packages. Generally there are various assessment types to evaluate a teacher / learner / participant.

    Some of the assessment types are

    1. Objective

    2. Essay

    3. Oral Question

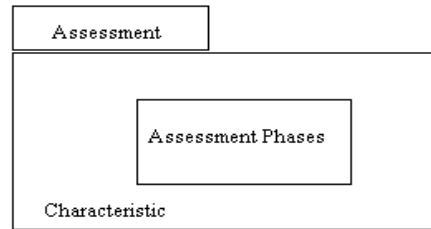   4. Performance Assessment

    5. Portfolio Assessment

Figure 1. The Assessment Package

2. Course Types

The Course Types package and its contents always describe a course in U-Learning. Depending on the subject involved in a course the differences between the courses can be identified. To reach the targets in learning the course type and its contents play a vital role.

Generally there are various courses like

1. Seminar

2. Lab course

3. Extension course

4. Elective course

5. Workshop

6. Lecturing

7. Orientation course

8. Refreshing course

9. Required course

10. Project course

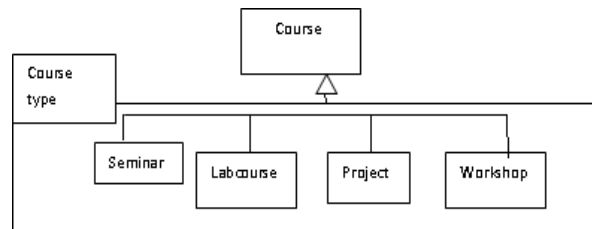11. Interactive course

12. Language course

Figure 2. Course Types

Generally there are courses which only communicate information with no performance expectations or give step wise instructions that have specific outcomes or share guidelines to help the learner solve problems. Some of the course types are included in Figure 2.0.

3. Evaluation

The Evaluation package describes different methods for assessing the strengths / weaknesses of the participants / course / learner. The Evaluation type characteristic is shown in Figure 3.0. It is a systematic method of collecting the material, analyzing it and makes decisions about the performance of the policy /program / participant/learner. Consider the following example where various steps for evaluation are shown to review a program/ a course.

Evaluation is methodologically diverse using both qualitative methods and quantitative methods, including case studies, survey research, statistical analysis, and model building among others. Generally the following are a more detailed list of methods, techniques and approaches for conducting evaluations

1. Alternative assessment
2. Assessment
3. Benchmarking
4. Case study
5. Experiment
6. Grading
7. Inquiry
8. Interview
9. Observational techniques
10. Opinion polling
11. Project management
12. Qualitative research
13. Questionnaire
14. Self-assessment
15. Student testing
16. Peer Evaluation(horizontal)
17. Self examination
18. Instructor Evaluation(vertical)
19. Generic evaluation
20. Instructor Examination

4. General

The General package is used for two reasons like reusability and when any characteristics are not matching with the existing ones. If it matches with any existing packages then the general characteristic can adopt that symbol.

5. Interactive Elements

The Interactive Elements package consists of other characteristics that enable interaction and interactivity among participants, learner / instructor.
Generally there are various kinds of interactive elements like

1. Diary

2. Live polling

3. Integrated video and audio.

4. Real-time chat

5. Team workspaces

6. Publish

7. Meeting

The interactive type characteristic is shown in Figure 4.0.

4. Examination Scenarios Using CharacteristicUML

Using these elements characteristic diagrams, packages can be constructed. These packages helps in the design of the course content easier and enable reusability.

1. Examination.

Name: Evaluate participants' learning

Description. The examination is a process of evaluating the performance of the students. This examination may be conducted either orally or as written. The student writes the examination and waits for the results. The instructor has to conduct the exam. For this the instructor prepares necessary notices, syllabus, timetable, allotting the duties and other resources.
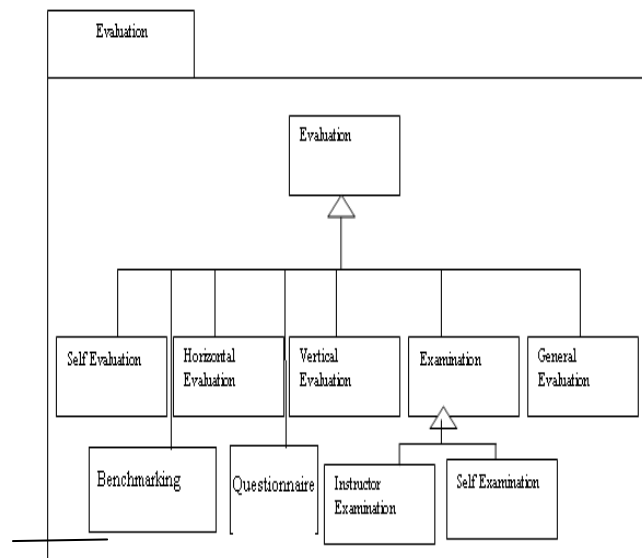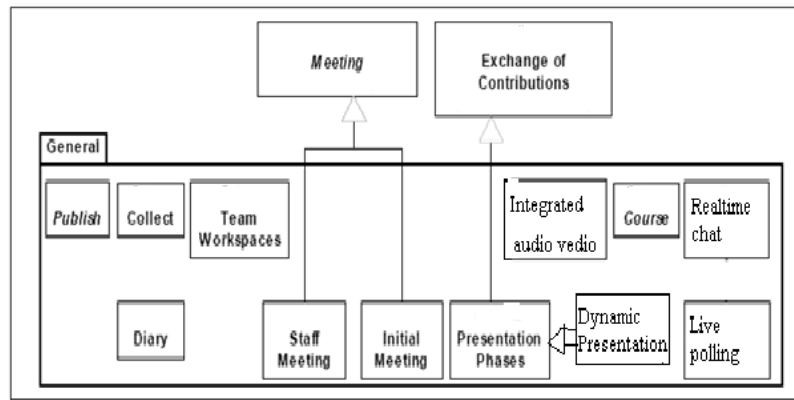

Figure 3. Evaluation Type

Figure 4. Interactive Element

The characteristic PUBLISH is used for this purpose. Hence the Examination characteristic implements another characteristic called EXAM, CONDUCT EXAM, PUBLISH. Once the exam is conducted the instructors have to evaluate the paper.
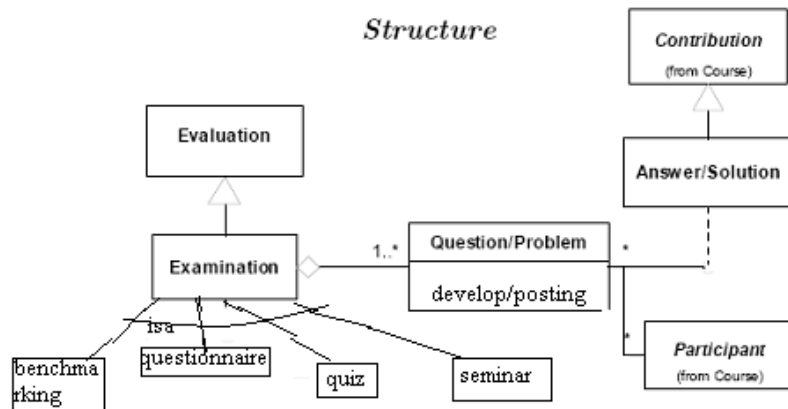

Figure 5. The stucture of Examination Package

This is done using the characteristic Evaluate. In order to help the students the instructor has to prepare model question papers, solve previous year's papers. Hence the instructor has to assume himself/herself as a student and face a self test. This is done through the characteristic SELF EXAMNIATION.

Hence there are two kinds of examinations SELF EXAMINATION, INSTRUCTOR EXAMINATION applicable to this characteristic. The following is a structure diagram which explains the relationship between various elements of this package.

The Figure 5 explains the structure of examination package, Figure 7 and Figure 6 explains the activity and dependency diagram for this package. The two roles participated are instructor and participant.

2. INSTRUCTOR-EXAMINATION

Package: Evaluation

Name   Instructor Evaluation through questions.

Description Usually the instructor conducts / announces the examination for their course. In order to help the students to perfectly learn the course, the instructor has to submit the key to the exam paper so that their evaluation is justified. Hence the instructor has to papers themselves for the examination which we called it as INSTRUCTOR-EXAMINATION where the instructor attends a SELFEXAMINATION.
Sequence and structure are inherited.

The characteristic diagram explains the relationship between Examination and other package like Evaluation

3. SELF EXAMINATION

Package: Evaluation

Name Self examination

Description This is a form of EXAMINATION which may be used by participants to examine themselves.
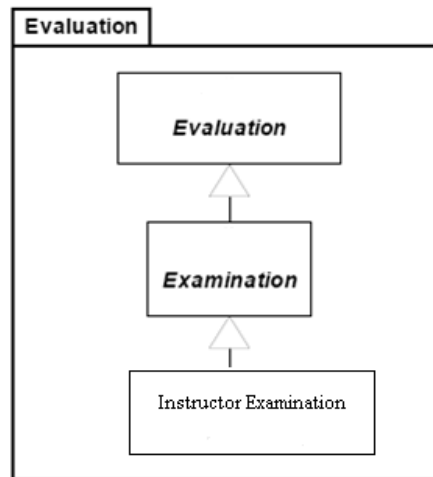

Figure 6. The Characteristic Dependency diagram for Instructor Examination
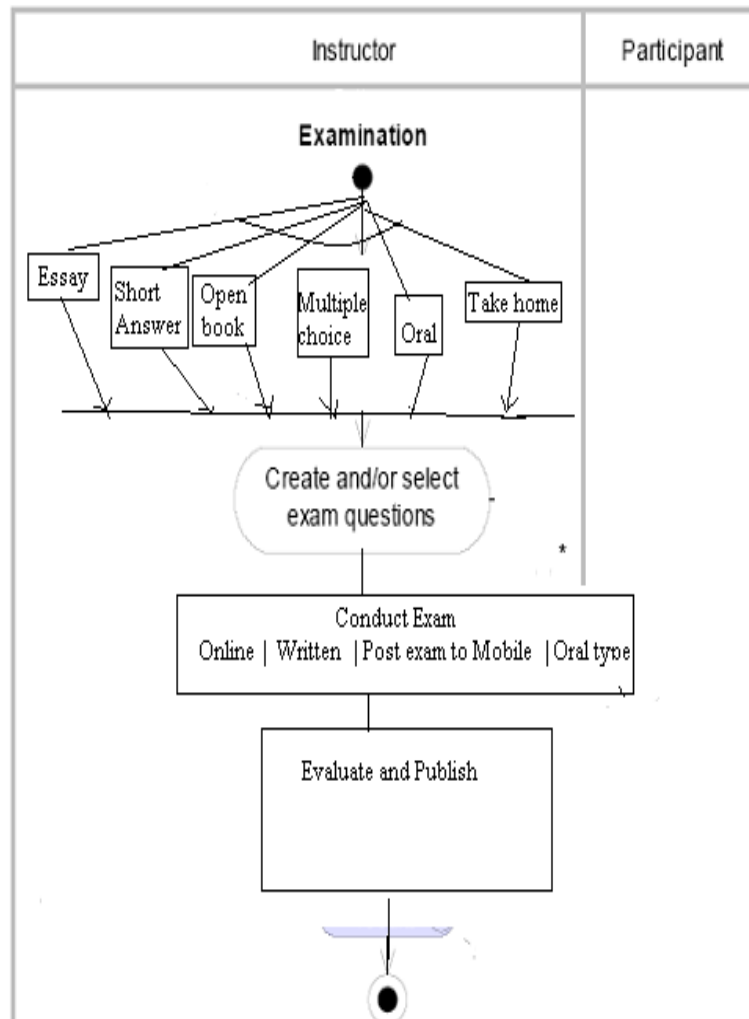
Sequence

Figure 7. The Characteristic Activity diagram for Examination

The Figure 8 explains the relationship between Examination and Self Examination. The diagram explains that the Self examination derives its properties from its base characteristic elements like examination and evaluation. The relationship between the examination and other kinds of examinations like instructor examination, Benchmarking are also shown in the figure.
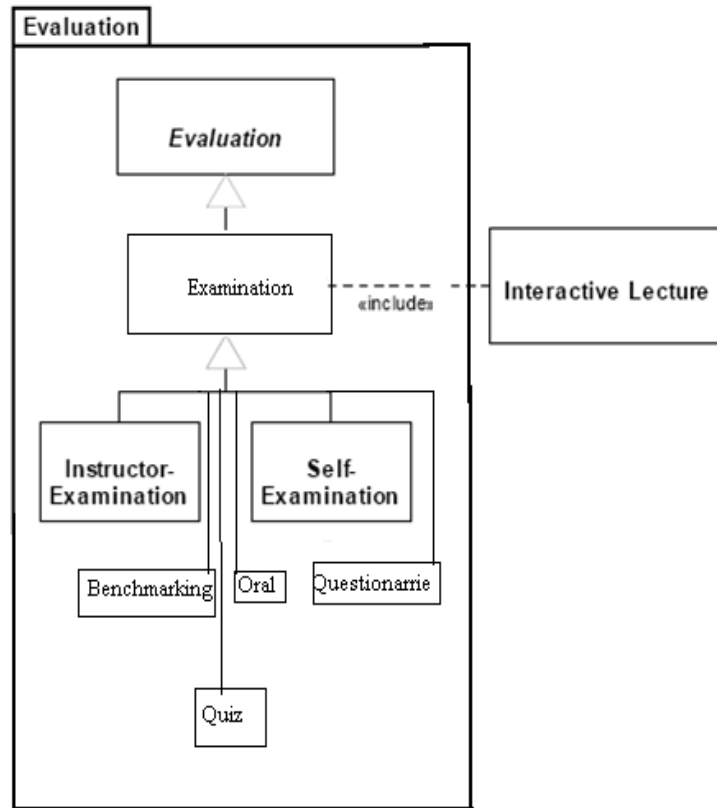
Taxonomy/Dependencies

Figure 8. The Characteristic Dependency diagram for Evaluation

5. Conclusion

In this chapter we had introduced the concept of characteristic which used for modeling the design of a course. The elements of characteristic, the relationships between the characteristics, the various characteristic diagrams are discussed. The various characteristic packages like Assessment, Evaluation, Feedback, Examination, and Evaluation are discussed in detail through its name, description, structure, parameters, sequence and dependency sections. This chapter gives a detail overview for implementing a U learning course.

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