Designing A Web Application System For Paper Presentations and Evaluations (P.P.E) As A Blackboard Architecture Project

Mohammed Assiri

1. Project Description

Some courses, such as “CAS 703”, train students to present and review some scientific papers. This mission is achieved when its three sub-systems are completed as follows:

1.1. Paper Assignment

- The students enter their information into the system
- The instructor approves or disapproves the students’ information.
- The instructor provides initially a reading list for the students.
- Each registered student selects certain number of papers.
- The instructor approves or changes the students’ selections.

1.2. Paper Presentations

- The instructor assigns a paper for each student to present during a class.
- The audience (both the instructor and students) should evaluate the presentation and the presenter by guidance of presentation-evaluation form.
- The presenter will eventually receive scores and may also receive feedback upon completion of his/her presentation.

1.3. Paper Reviews

- The instructor assigns some papers for each student to review timely.
- Each student should review papers by guidance of a giving review template.
- The instructor evaluates and grades the students’ reviews.

2. Project Requirements

2.1. Functional Requirements

- The application must allow the instructor to make any changes to any process.
- The application shall provide average scores and generate reports.
- The application shall be independent from individual students (i.e. absent students have no effect on the processes).
- The application shall allow only approved students to participate.
- The application shall allow selected students to access only selected type of data (e.g. a student can only see his/her received scores and feedback).
- The application shall allow the instructor to have full access to all data.
- The application shall provide instructions (e.g. help centre).
- The application shall be available only at selected times by the instructor.

3. Non-functional Requirements

3.1. Usability Requirements

- The application shall be easy for both instructors and students to use.
- The application shall be easy for both instructors and students to learn.

3.2. Performance Requirements

- The application shall have a maximum response time of three seconds for any process.
- The application must be accurate to calculate average scores, and assign given papers on “first-reserve, first-get” basis.

3.3. Reliability and Availability

- The application shall be only available for the specified time by the instructor for each task.

3.4. Operational Requirements

- The application must be able to interact with any HTML browser.

3.5. Security Requirements

- Only the instructor can access and change all data.
- Only selected students can see selected data.

4. Justification

Adapting the blackboard architecture ([1], [2], [3] and [4]) is unusual enough for a web application [5]. However, the works in ([6] and [7]) were inspired to proposed a new web application that adopts the blackboard architecture.

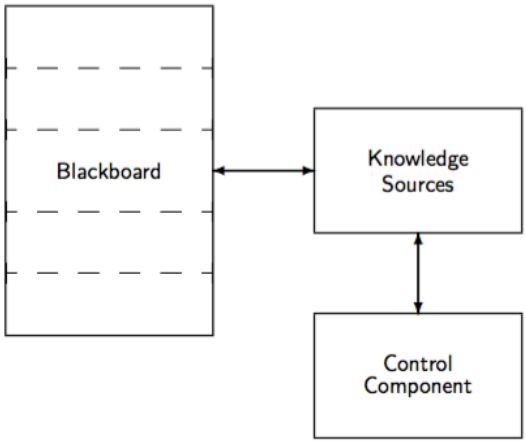
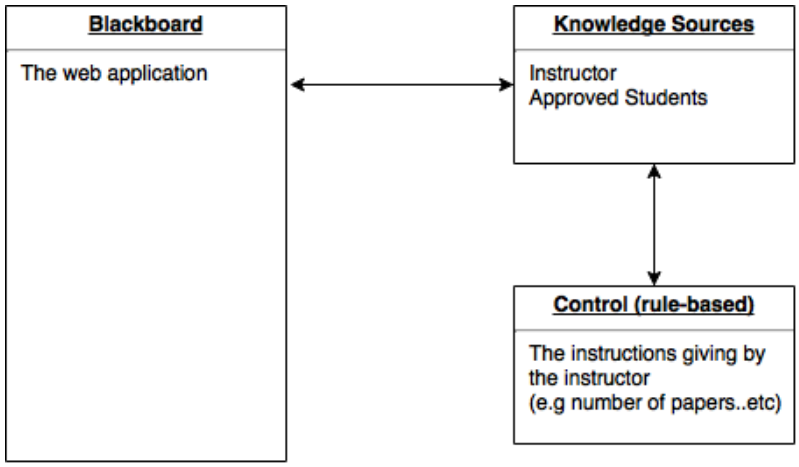


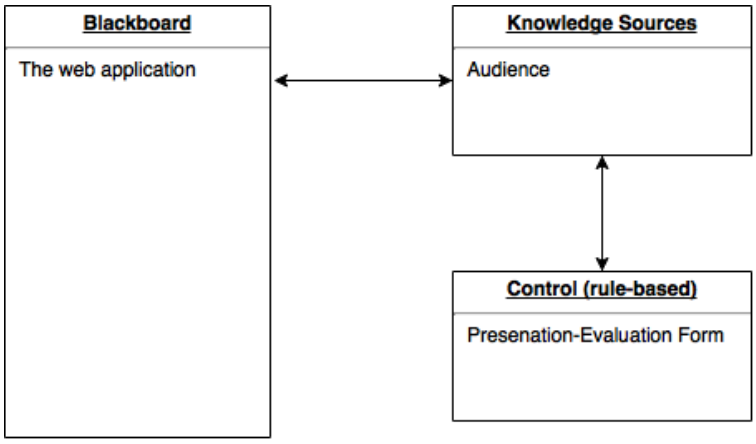
Figure 1: Basic Components of the Blackboard Model [8]

This system "Paper Presentations and Evaluations (P.P.E)" was adopted satisfiably into the assigned blackboard architecture via defining each component of the blackboard architecture (i.e. knowledge sources, blackboard, and control) in each sub-system (i.e. paper assignment, paper presentations, and paper reviews) of the entire system (P.P.E) as follows:

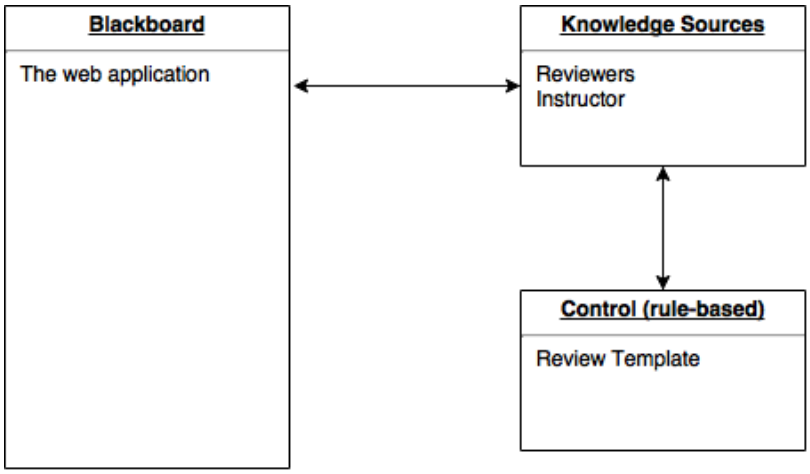
1. Paper Assignment



2. Paper Presentations



3. Paper Reviews



References:

[1] Khedri R., “Patterns for Data Centered and Hierarchy Architectures”. A course on “Software Design”, CAS Department, McMaster University, 2016.

[2] Hunt J., “Blackboard Architectures”, JayDee Technology Ltd 27, 2002.

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[5] Rudenko D. and Borisov A., "An Overview of Blackboard Architecture Application for Real Tasks", Scientific Proceedings of Riga Technical University, 2007.

[6] Metzner C., Cortez L., Chacin D., “Using A Blackboard Architecture In A Web Application”, The Journal of Issues in Informing Science and Information Technology, Volume 2, 2005, pp. 743-756.

[7] Ortega-Arjona J. and Fernandez E., “The Secure Blackboard pattern”, Procs. 15th Int. Conference on Pattern Languages of Programs (PLoP 2008).

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