

# Quality Assurance Procedures: New Enhancements to the Learning Management System at AOU

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*Abstract - This paper presents a complete description of the improvements that have been conducted for the learning management system at Arab Open University. AOU is the first regional university for open learning in the Middle East and North Africa. The university has strict regulations on the learning process to assure the quality of delivering all learning activities in an optimal way. Accordingly, there is a need to improve the existing learning management system to guarantee the implementation of such quality assurance regulations electronically to save time and cost and to perform all required procedures. In addition of describing the improvements, this paper also conducts a comparison between conforming with such regulations manually and the new online procedures over the learning management system.*

**Keywords:** CMS, quality assurance, TMA, learning management system, e-learning

## 1. Introduction

AOU is a non-profit organization that adopts an open learning methodology to be able to accommodate larger number of students and allow a great deal of flexibility while maintaining respectable academic standards, which are controlled by a set of procedures to guarantee the quality assurance of the whole learning process. AOU has partnerships with the United Kingdom Open University (UKOU) and other national educational institutes, e.g., Ministry of Higher Education and international institution, e.g., UNISCO; to help ensure a good quality of learning.

AOU has been established, with branches across many Arab countries, to provide higher education opportunities to many potential students, who otherwise may not have the chance to attend higher education due to many reasons. Furthermore, there is a huge demand for higher education in the Arab world and limited resources available for traditional learning environment. Therefore, the need for non-traditional and more innovative learning methods are vital. AOU is the first university in the Arab world to pay attention to these needs and to play a major roll of offering educational opportunities to such students.

Using the technology of the Internet, and especially online education, offered the potential to transform how we learn. It can truly move us into the concept of lifelong learning. Students can work with that information and, through dialogue and discussion with others around the globe, construct knowledge. Students can participate when they want and integrate their learning into their overall lifestyle. They can access information on every conceivable topic from a computer at home and interact with others to make that information applicable to their lives.

There is no need for most of us to sit in a class with a hundred other people and listen to a lecture. Setting up an online class would then let learners access this information and through discussion and dialogue (either through asynchronous email or synchronous chats), discuss the information with both other learners and the instructor. There are still face-to-face meetings to be used for

structuring the learning into our work and for social reasons [1]. Currently, there is a lot of research into how to effectively combine online learning and face-to-face meetings in what are called “hybrid” courses.

To accommodate the learning activities on an electronic platform, AOU uses a course management system called Moodle. Moodle is an open-source course management system (CMS) used by educational institutes, businesses, and even individual instructors to add Web technology to their courses. Moodle is currently used by more than 2500 educational organizations around the world to deliver online courses and to supplement traditional face-to-face courses. Course management systems are web applications, meaning they run on a server and are accessed by using a web browser. The server is usually located in your university or department, but it can be anywhere in the world. Teachers and students can access the system from anywhere with an Internet connection. Moodle provides many learning tools, and activities such as forums, chats, quizzes, surveys, gather and review assignments, and recording grades. The Moodle community has been critical in the success of the system. With so many global users, there is always someone who can answer a question or give advice. At the same time, the Moodle developers and users work together to ensure quality, add new modules and features, and suggest new ideas for development [6, 9]. Moodle also stacks up well against the feature sets of the major commercial systems, e.g., Blackboard and WebCT [5].

In order to guarantee the optimal performance of the learning process, AOU with the cooperation of UKOU has established structured procedures of quality assurance regulations and instructions. These procedures contain a set of reports to monitor the learning activities including face-to-face meetings, samples of tutor marked assignments (TMAs), monitoring forms of TMAs assessments and feedback, quizzes, student surveys, and tutor surveys. These reports are collected and reviewed; first at the faculty with the cooperation of the quality assurance unit at the branch level before sending all reports to the headquarter where they are reviewed by external examiners. Performing and collecting the required samples is a long process and consumes the time and effort of many people including tutors, course coordinators, program coordinators, and quality assurance officers.

This paper presents the process of performing and gathering the required samples for quality assurance electronically [6, 9]. We investigate enhancing the learning/course management system Moodle by adding features to perform such tasks electronically and automatically. We also present creating an organized structure to store the required information. Each faculty offers a set of courses, each course has many sections and are conducted by one or more tutors. Three samples are required for every activity at the section level; every activity has its own monitoring process, so it is important to store this information in an organized structure. Finally this paper emphasizes the reduction of time and effort, in addition to the accuracy of using the online enhancements to the LMS compared with doing the process manually. It is an opportunity to improve on areas of learning and teaching; to encourage interactivity and to contribute positively to the learning and teaching targets of the online institutes.

## **2. Related Work**

The recent years have witnessed lots of research on discovering alternative educational delivery methods in an attempt to reduce costs of the existing traditional methods while enhancing the quality of the teaching/learning processes. These research efforts are derived by the advent of low cost and high performance Information and Communication Technologies (ICTs) [7].

To facilitate the use of ICT in learning, many educational institutions utilize Learning Management Systems to produce their own elearning platform. There are many commercially available LMSs such as WebCT, CoSE and Blackboard. For a more detailed study of LMSs and a comparison between them see [3, 4, 11].

There are currently many projects who aim to construct elearning platforms in lots of universities. The work in [8] discusses the implementations of elearning platforms in five different UK universities. The paper reports that all of these universities independently choose Blackboard as the LMSs for their courses. There has been efforts to build a uniform conceptualization and understanding of LMSs based on how they are implemented across different contexts [2]. Some of the issues raised in [2] which are relevant to our discussion here, such as the observation by Mavridis which states that the implementation of LMSs is no longer a luxury, but rather a necessary response by the educational systems to the new, urgent, and very fundamental changes in our societies.

There has been a lot of effort in the research and development to use computer technology in learning [3, 7, 8, 10, 11]. In this paper we present the developments that have been implemented within Moodle in order to enhance the learning process at the Arab Open University. These enhancements have an effect on many educational and administrative factors but we will focus in this paper on the influence of such developments over the quality assurance procedures as a part of an integrated virtual learning environment. The main goal is to perform research on the quality assurance components, within the AOU context, in terms of identifying the basic procedures and designing the interaction between these procedures and the LMS. We believe that such an environment can be deployed to varying degrees in other e-learning platforms.

### **3. Quality assurance procedures at AOU**

Arab Open University with the collaboration with UKOU performs a number of procedures to guarantee the quality of learning process. The description of these procedures are summarized in the following points:

- TMA marking template: Tutor marked assignment template is a form filled by the tutor of a course for each submitted TMA by students. It contains the deserved grade for every part of the TMA along with the feedback comments to the students.
- TMA monitoring: A form filled by the course coordinator and the program coordinator designed for monitoring tutors marking and filling the TMA templates.
- TMA samples: Three TMA samples should be collected for each section. One with a good grade, one is average, and one with a low grade.
- Quiz samples: Three samples should be collected for each quiz.
- Final exam samples: Three samples should be collected for each section of every course.
- Student questionnaire: A questionnaire filled by the students of every section to monitor the tutor, the course, and the tutoring environment.
- Tutor view questionnaire: A questionnaire filled by tutors to monitor the course content and the tutoring environment.
- Face-to-face preview: A form filled by the program coordinator to monitor tutor performance after attending a tutoring session of a specific tutor.
- Final grade statistics and distributions: grades reports and distributing of grades generated by SIS system after submitting student final grades.

At the end of each semester, each course coordinator has to prepare a complete folder that contains the following documents:

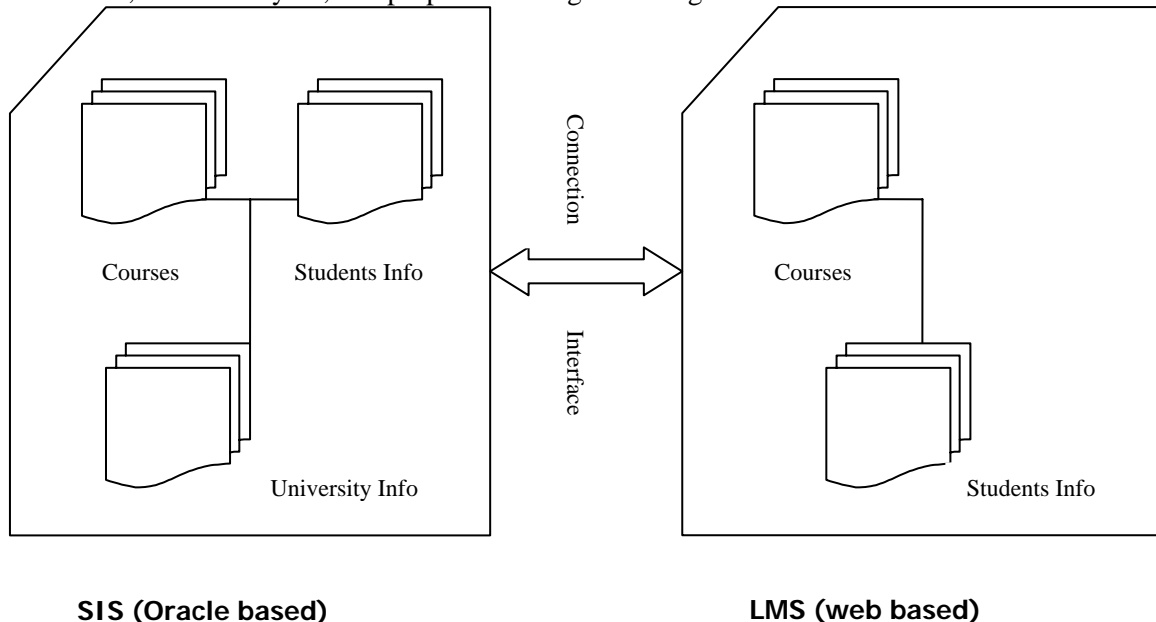
- Three samples of a marked TMA for each tutor in the course, each sample should be associated with its marking template and its monitoring form approved by the program coordinator. Notice that the three samples should be selected randomly; one is good, one is average and one is weak.
- Three samples from each quiz during running the course. One sample from each of the good, average and weak categories.
- Three samples from the marked final exam of the course. One sample from each of the good, average and weak categories.
- 4-The face-to-face monitoring form for each tutor.
- The tutor monitoring forms
- Results of student questioners on the course level and for each tutor.
- Students' grades
- Grade distributions and statistics.

One of the duties of the program coordinator is to supervise the preparation of the above documents for all courses in the program and send them to the headquarter of the university to be reviewed from the external examiners whom usually come from UKOU.

Notice that preparing and performing such documents consume the time and efforts of many administrative and educational members of the university including tutors, course coordinators, program coordinators, and secretaries.

#### 4. Enhancing the LMS

The main goal of this paper is to present the required enhancement over the LMS in order to apply the quality assurance procedures mentioned in the previous section. Furthermore, we will focus on the advantages of automating the above procedures in terms of accuracy, random selection, bias avoidance, online analyses, and proper archiving and filing.



**Fig 1. Diagram of integration LMS with SIS.**

LMS integration with SIS or (LMS-SIS) is a system used inside the university for managing student accounts and their courses and groups. AOU can benefit from the services of the LMS-SIS like reducing time and effort, automatically generating accounts minimizing faults and errors. Obtaining availability of requirements and simplifying registering, entering and filling process. Fig. 1 shows the diagram of the integrated LMS-SIS systems.

Arab Open University contains multiple systems that were never designed to work together. The business units that fund these information systems are primarily concerned with functional requirements rather than technical architectures because information systems vary greatly in terms of technical architecture. Enterprises often have a mix of systems and these systems tend to have incompatible architectures. AOU-SIS is organized into three logical layers: presentation, business logic, and data. When we integrate multiple systems, we usually want to be as non-invasive as possible. Any change to an existing production system is a risk, so it is wise to try to fulfill the needs of other systems and users while minimizing disturbance to the existing systems.

Likewise, we usually want to isolate SIS internal data structures. Isolation means that changes to one of SIS's internal structures or business logic do not affect other applications like LMS. Without isolated data structures, a small change inside an application could cause a ripple effect and require changes in many dependent applications. Reading data from a system usually requires little or no business logic or validation. In these cases, it can be more efficient to access raw data that a business layer has not modified.

Many preexisting applications couple business and presentation logic so that the business logic is not accessible externally. In other cases, the business logic may be implemented in a specific programming language without support for remote access. Both scenarios limit the potential to connect to an application's business logic layer.

When making updates to SIS data, we should generally take advantage of the SIS business logic that performs validations and data integrity checks. We can use Functional Integration to integrate systems at the logical business layer. Direct access to an application data store may violate security policies that are frequently implemented in the SIS business logic layer.

Integrating SIS and LMS at the logical data layer is done by allowing the data in SIS to be accessed by LMS. To connect SIS and LMS at the logical data layer, we maintain data copies of the SIS database so that LMS can read the data and potentially update it. We don't use a shared database since we do not read data directly from the same database for performance and reliability issues. Instead of sharing a single instance of a database between applications, we make multiple copies of the database so that each application has its own dedicated store. To keep these copies synchronized, we copy data from one data store to the other.

This approach is common with packaged applications because it is not intrusive. However, it does imply that at any time, the different data stores are slightly out of synchronization due to the latency that is inherent in propagating the changes from one data store to the next. Regardless of the type of data integration we choose, the benefits are as follows:

- Non-intrusive. Most databases support transactional multi-user access, ensuring that one user's transaction does not affect another user's transaction. This is accomplished by using the Isolation property of the Atomicity, Consistency, Isolation, and Durability (ACID) properties set. In addition, many applications permit you to produce and consume files for

the purpose of data exchange. This makes Data Integration a natural choice for packaged applications that are difficult to modify.

- High bandwidth. Direct database connections are designed to handle large volumes of data. Likewise, reading files is a very efficient operation. High bandwidth can be very useful if the integration needs to access multiple entities at the same time. For example, high bandwidth is useful when you want to create summary reports or to replicate information to a data warehouse.
- Access to raw data. In most cases, data that is presented to an end user is transformed for the specific purpose of user display. For example, code values may be translated into display names for ease of use. In many integration scenarios, access to the internal code values is more useful because the codes tend to be more stable than the display values, especially in situations where the software is localized. Also, the data store usually contains internal keys that uniquely identify entities. These keys are critical for robust integration, but they often are not accessible from the business or user interface layers of an application.
- Metadata. Metadata is data that describes data. If the solution that you use for data integration connects to a commercial database, metadata is usually available through the same access mechanisms that are used to access application data. The metadata describes the names of data elements, their type, and the relationships between entities. Access to this information can greatly simplify the transformation from one application's data format to another.

## 5. Conclusion

This paper introduced a complete description of the improvements that have been conducted over the learning management system at Arab Open University. The university has strict regulations on the learning process to assure the quality of delivering all learning activities in an optimal way. Accordingly, there is a need to improve the existing learning management system to guarantee the implementation of such quality assurance regulations electronically to save effort and to perform all required procedures. We have introduced in this paper the improvements and the procedures that have been done to enhance our learning management system. In addition of describing the improvements, this paper also presented the new tools that have been added to the learning management systems which support the quality assurance procedures. We are planning to continue such enhancements to integrate other systems with the learning management system such as the human resource system and financial system.

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