**On-line Assessment and Evaluation System**

This document discusses the organization of modules for the OAES implementation along with the necessary processes needed to successfully complete the on-line examination.

OAES will comprise of the following four modules.

1. Item Bank Management
2. Question Paper Management
3. Assessment
4. Evaluation

The above modules have been identified considering that each of them could be operationalized independently. In addition, the activities involved to develop them could also be taken concurrently assuming that suitable interfaces have been defined for their interaction and seamless integration after all of them have been developed. The interaction among all these modules will be through a secure channel such that best exam practices could be followed in conducting all examinations carried out using OAES. In addition to using a secure mechanism for either transmission of question papers (before the examination is held) as well as answer responses (after the examination is held), it will be mandatory to set up secure servers to maintain the item bank and preserve the answer responses.

It should be noted that for the four identified modules, three of them – the Item Bank Management module, Question Paper Management module and the Evaluation module will be installed off-site, and the Assessment module has to be installed at the site of examination, which we will be calling as “on-site” throughout this remaining document.

Two administrator roles have been identified, and those would be responsible for configuring each of the OAES modules and there by ensuring that question paper delivery along with necessary examination related tasks are carried out in a prescribed order and time. This should be helpful in successful completion of examination process along with final dissemination of examination results.

This suggests that the off-site administrator will be responsible for configuring Item Bank Management module even before the items are generated. The off-site administrator will also be configuring the Question Paper Management module ensuring necessary settings for generation of question paper along with its delivery mechanism. In addition to these activities, the off-site administrator will also be responsible to restrict the scope of activities for on-site administrators.

The on-site administrator will be responsible for receiving the question paper before the examination actually begins. It will also ensure that all submitted answer responses are successfully collected on the site of examination before they are successfully transmitted to the secure server where the evaluation module has been configured. It should also ensure that no footprints are preserved on the site of examination of any type including questions as well as answer responses and corresponding student identity. However, it should be noted that removal of footprints will not be a manual activity which an on-site administrator could control. Rather, it should be an atomic activity which is automatically carried out after answer responses have been successfully transmitted and acknowledged.

In the end, each of the student who has appeared in the examination will be intimated about the results in a prescribed time frame through a separate email communication after the completion of examination and the same will also be reflected in their respective on-line accounts.

Following functionality shall be carried out by each of the above modules.

**Item Bank Management Module**

Generation of new items. This should be structured based on the different cognitive levels as well as the topics in the respective subjects (or courses). The information about which topics have to be considered per subject along with their degree of detailing for every topic and the number of related questions that are to be generated should be considered as a key parameter in item bank generation. It should also assist in reviewing the existing questions in the the item bank and provide a quantitative mechanism to phase out old items based on those that have already been used in the examinations held. However, phasing out of old items should not be indicative of removing them permanently from the system. It should be archived in a manner that the phased out items are no more selected for any examinations held in future. At the same time, this module will have a mechanism in place that permits restoring any phased out items and making them usable for any future examinations.

**Question Paper Management Module**

This module will be responsible for generation of question paper for the scheduled examination and ensure its secure transmission to respective examination centers at a preset time before the start of examination. Another key functionality of this module will be generation of question paper based on a specific structure (or template) of question paper for a specific subject (or course) before its transmission. Different subjects may have different structure (or template) for the question paper being generated for that subject. The structure (or template) itself could be subject to changes from time to time, in case such a need arises and the examination body intends to do so.

**Assessment Module**

This module will be configured on the site of examination and will be responsible for receiving the question-paper and transmitting answer responses to the Evaluation module after the examination has been conducted.

**Evaluation Module**

This module will be responsible for evaluating the received answer responses for all the students who appeared in the examination. It shall implement all the different methods needed for evaluation of different question types and compute the final exam score for every student. It shall also communicate to the respective students through email the examination results along with updating their respective on-line accounts.