

EVAF4All - Electronic Voting Analysis and Feedback for All

Requirements Specification – Phases 1 & 2

1. Introduction

This document outlines the aims and requirements for EVAF system to be created for the EVAF4All project. EVAF is an online web-based tool that will allow students to view their EVS (Electronic Voting System) responses to questions in lectures/tutorials for the purposes of revision and reflective learning. In general use, staff will upload new EVS voting data periodically for a course (providing the required data like the session/lecture title, etc) and students can then see their own data in an accessible way. Staff users will be able to view student data in aggregate form to assess the efficacy of their questions.

EVAF4All is the project name for a re-development of a University of Edinburgh trial system called EVAF. The development will centre on redeveloping EVAF to be able to cope with different FE/HE infrastructures from those employed at Edinburgh – this includes different loan system options, optional VLE integration and different EVS providers. EVAF4All will also extend EVAF's general-usage functionality – for example by allowing additional question types.

In the following sections, Rx.y and Rx.y.z indicate the requirements for the EVAF system. These are broad-based requirements and are not meant to imply details of implementation.

This document relates to the Phases 1 and 2. Phase 2 activities are highlighted with an asterisk (*) for either the requirement or within the requirement if the phase 2 activity is a component of a single requirement.

2. Design Principles/Aims

R2.1 EVAF must be easy to use by both staff and students and easy to administer by someone with a reasonable knowledge about the system. If it is not simple to use then staff won't use it!

R2.2 EVAF will allow a 'privacy policy' to be selected at an institution level and this will influence how much student data staff can see – from 'Private' to 'Summary' to 'Full'. With a default 'Private' privacy policy, EVAF will only allow users to see *their* data and will not allow staff to see an individual student's responses to any questions they have answered.

R2.3 EVAF will be designed with flexibility in mind – with no preference towards any particular EVS system or version.

R2.4 Use of EVAF will not impose large changes in practices on staff for the collection and use of EVS session information. It will not impose the use of tools like PowerPoint.

R2.5 EVAF will allow both staff and students to home in on subsets of questions of a course through the use of 'filters'. These will be set to facilitate individual reflection.

R2.6 EVAF will be responsive and scale to thousands of users and dozens of courses.

R2.7 EVAF will allow direct linking to all courses, a course's question list and a question's analysis from outside the system.

R2.8 EVAF will work with all current and recent generation web browsers.

R2.9 EVAF will provide consistent navigation and quick links to help students and staff navigate the tool.

R2.10 EVAF will have configurable authentication options (EASE/Cosign, application-based authentication) to best suit the institution's needs.

R2.11* EVAF will allow LDAP as an alternative authentication option

R2.12* EVAF will have configurable branding options to enable use and integration by many institutions.

R2.13* EVAF will provide runtime configuration options to allow for flexibility in local setup and increased security.

3. Definitions

Important definitions:

- 'Clicker' – a generic term used to refer to the hardware an individual uses to vote – usually a small handheld device
- 'Course' - a single course as defined by the institution - e.g. Physics 101 in 2008-2009. Note that courses will normally run in more than one year and must be differentiated. A course may be 'active' (shown to students) or 'inactive' (hidden from students)
- 'User' - a generic term for a user of the EVAF tool - categorised by type - student, staff, admin.
- 'Student' - an individual who has been allocated a clicker and can use the system to view their own (and class) clicker data
- 'Staff' - this category of user will have more privileges than students, being able to view all student responses and more summary data
- 'Administrator' (admin) - the user with the most privileges - able to set up courses and staff users
- 'Question Response' - an individual student's response to a question - at the UI side this might be represented as a graph indicator as well as text data. Note

that responses may be declared 'invalid' – i.e. outside the range of valid responses for the question

- 'Session' - a period of time over which one or more questions has happened - usually these will be lectures, but not always.
- 'Question' - an individual question (with a valid answer) that has been run in a session. Questions may be asked more than once - even in a single session.

4. Contexts

4.1 User Types

R4.1.1 There are three types of users in EVAF – Students, Staff and Administrators. Staff and Administrator users cannot also be Students.

R4.1.2 **Students** can access questions and their responses for the courses that are making use of the EVAF system

R4.1.3 **Staff** have access to a number of courses and for each course they have access to, they can have a per-course role of Course Manager or Course Auditor.

R4.1.4 **Administrators** manage the creation of new courses, users and sources for the EVAF system.

4.2 Information Sources

EVAF will only succeed if it can successfully integrate with the required external systems and tools in such a way as to remove the barriers for acceptance by staff.

R4.2.1 EVAF will automatically interact with the configured loan system in a number of administrator-configurable ways - such as DB link*, local CSV file upload, SFTP download. This automation allows students and staff to ignore the practical details of associating clicker ids (recorded by EVS software) with students.

R4.2.2* EVAF will (optionally) automatically interact with the institution's VLE system using the VLE module to maintain up-to-date student course membership lists so that staff need not bother about including new students, etc.

R4.2.3 EVAF will support import of exported 'sessions' from Interwrite's PRS software v4.x and v5.x, and TurningPoint 2008* and will allow for expanding these options in the future.

R4.2.4 EVAF will help as much as possible to facilitate the importing of clicker data that the staff have recorded as EVS sessions.

R4.2.5 EVAF will allow for non-automated sources for loans and course students – such as through CSV upload.

4.3 Question Types and Response Options

R4.3.1 EVAF will support common question types – Multiple Choice Question (Numbers or Letters), True or False and MRQs* (Multiple Response Questions).

R4.3.2. EVAF will allow for confidence modifiers to responses (as in PRS v4.x)

R4.3.3 EVAF will allow for Response Times (as in PRS v4.x) per response

R4.3.4 EVAF will allow for possibility of invalid responses to a question as well as non-response (not attempted).

R4.3.5 EVAF will allow for a question's correct answer to be 'None' or 'All'.

4.4 Question Filters

An important aspect of EVAF will be the ability for the student or staff member to focus on subsets of questions of a course – for example for a student to see which questions they answered correctly that the class in general found 'difficult'. Filters will include:

- 'Easy' question – where a high percentage of the class got the answer correct
- 'Hard' question – where a low percentage of the class got the correct answer
- 'Tricky' question – where an incorrect response obtained the most votes over the correct answer

4.5 Privacy Policy

R4.5.1 EVAF will allow a privacy policy to be selectable, based on the institution's own policy on how clicker data can be used. The policy will be one of several presets and will allow staff access to differing amounts of student data. The policies are:

R4.5.1 Private – no student data is exposed to staff members. Only class responses as a whole are indicated.

R4.5.2 Summary-only* – staff can see overall percentage scores and session attendance lists.

R4.5.3 Full-access* – staff can view a student's responses as the student themselves can see it.

4.6 VLE Module

EVAF can make use of a VLE module but this is not compulsory. The VLE module allows for auto-updating of course students from the institution's VLE. Not installing the VLE module will result in less accurate statistical analysis of votes.

5. Student View of EVAF

In the following list of requirements we assume that the student has at least one course that is making use of the EVAF system. On login, students are presented with the 'My Courses' home page.

5.1 'My Courses'

R5.1.1 EVAF will display a list of participating students' courses each with year, title, course organiser, administrator, number of questions posed as well as summary indicators as to how well the student has answered the questions given – number correct and incorrect.

R5.1.2 EVAF will allow a mechanism for students to contact course organisers and administrators by email.

R5.1.3 EVAF will indicate the privacy policy for this tool in a prominent place on the home screen.

R5.1.4 EVAF will provide an easy and unique URL that students (and staff) can use to access this 'page' from an external site.

5.2 Course Questions

R5.2.1 EVAF will display a detailed list of questions for a selected course – each including date, title, session, lecturer, correct answer and student answer (if appropriate), and class average response.

R5.2.2 EVAF will display summary data giving an indication of how well the student is performing (number/percent of questions correct, etc) in this course.

R5.2.3 EVAF will allow filtering of questions based on both personal and 'class' criteria such as 'answered correctly/incorrectly', 'class found the question "easy"', etc. Filter will remain until 'reset' or a different course is visited.

R5.2.4 EVAF will allow filtering of questions based on search criteria – with search terms being drawn from the question title text and/or question tags. Filter will remain until 'reset' or a different course is visited.

R5.2.5 EVAF will provide an easy and unique URL that students (and staff) can use to access this course's questions from an external site.

5.3 View Analysis

R5.3.1 EVAF will display a Question Analysis for an individual question giving a graphical representation of responses for that question and other summary information.

R5.3.2 EVAF will indicate clearly the student's own response (if appropriate).

R5.3.3 EVAF will display response time information with the student's own response time indicated (if appropriate).

R5.3.4 EVAF will allow a student to post a non-anonymous comment for this question.

6. Staff View of EVAF

Staff members (once created by an administrator) can be assigned the role of Course Auditor or Course Manager per course by either another manager of that course or an administrator. Course Managers manage the editing of course information and importing of data to a course which students can then see. Course Auditors have a 'read-only' view of a course. On login, staff members are shown the 'My Courses' home page.

In the following requirements, (CM) indicates Course Manager only option per course. All other Requirements apply to all roles for the course.

6.1 'My Courses'

R6.1.1 EVAF will display a list of courses this staff member can manage and/or audit – each with year, title, organiser and administrator, number of questions, number of students and 'active' flag.

R6.1.2 EVAF will have a mechanism to allow easy emailing of course organiser and administrator.

R6.1.3 EVAF will allow access to a list of students and staff associated with each course.

R6.1.4 EVAF will provide a User Guide on how to use this system.

R6.1.5 (CM) EVAF will allow editing of basic course information.

R6.1.6 (CM) EVAF will allow for toggling the 'active' status of a course.

6.2 Course Questions

R6.2.1 EVAF will display a detailed list of questions for a selected course – including title, session date, correct answer (if appropriate) and 'votes correct' for each question. Questions are grouped into 'sessions'.

R6.2.2 EVAF will display summary data giving an indication of how well the class is performing in this course.

R6.2.3 EVAF will allow filtering of questions based on ‘class’ criteria such as ‘answered correctly/incorrectly’, ‘class found the question “easy”’, etc. Filter will remain until ‘reset’ or a different course is visited.

R6.2.4 EVAF will allow filtering of questions based on text-based search criteria. Filter will remain until ‘reset’ or a different course is visited.

R6.2.5 (CM) EVAF will allow for the importing of questions using data supplied by the manager – see Section 6.6

R6.2.6 (CM) EVAF will allow the editing or deletion of each question shown – see Section 6.7. A warning will be given before deletion.

R6.2.7 (CM) EVAF will allow for the editing or deletion of each session shown. A warning will be given before deletion – see Section 6.7

R6.2.8 (CM) EVAF will allow for the exporting of CSV data for all questions for this course – see Section 6.8

R6.2.9 (CM) EVAF will allow a simple mechanism to display a ‘leaderboard’ of 20 students with the highest number ‘correct responses’ – students are displayed either anonymously (by clicker id) or by name depending on the privacy policy used by the institution.

6.3 View Analysis

R6.3.1 EVAF will display a Question Analysis for an individual question giving a graphical representation of responses for that question and other summary information.

R6.3.2 EVAF will display Response Time information if available

R6.3.3 EVAF will provide an (optional) easy and unique URL that students and staff can use to link to this particular analysis from an external site.

R6.3.4 EVAF will allow for the submission of comments (and deletion of own comments)

R6.3.5 (CM) EVAF will allow for the deletion of all comments by a Course Manager.

6.4 View People

R6.4.1 Staff members can see a list of staff (Course Managers and Course Auditors) and students for each course – giving the name and username. Summary information (number of managers, number of auditors and number of students) is also shown.

R6.4.2 (CM) EVAF will allow existing Course Managers to add a staff member as an auditor or manager of this course through a simple form – ideally with some way of filtering. Note that the user must have been created already (by an administrator).

R6.4.3 (CM) EVAF will allow the removal of a courses current managers and auditors. A warning should be given if removing self.

R6.4.4 (CM) EVAF will allow the removal of ALL students from a course – thereby removing all their existing data (responses) for this course.

R6.4.5 (CM) EVAF will allow for multiple ways to renew the course student population for a course – through file upload or VLE-linked upload.

R6.4.6a (CM) If Privacy Policy is set to ‘Summary’ then EVAF will display summary percentage and attendance information next to student’s names.

R6.4.6b (CM) If Privacy Policy is set to ‘Full’ then EVAF will display summary percentage and attendance information next to student’s names and will allow the manager to view the Student’s view of his/her own responses and analyses.

6.5 Edit Course (CM only)

R6.5.1 EVAF will allow a course manager to alter the course information through some simple form interface. A ‘Course’ has the following elements:

- Title – the course title
- Code – must be of a valid form if a course is to fetch students via WebCT feed.
- Year – the year(s) the course runs
- Group – the organisational group within the institution
- Organiser – the course organiser
- Organiser Email – the course organiser’s email
- Administrator – the course administrator
- Administrator Email – the course administrator’s email
- Course Students Source – file upload or via WebCT feed
- Active – is the course currently hidden from students or not?

R6.5.2 EVAF will supply some mechanism to view the validity of a supplied Course Code if the VLE module is installed – ideally without having to submit the edited form.

6.6 Import Questions (CM only)

This is the mechanism whereby course questions (a 'session') can be imported into a course. Most EVS tools offer many data export options and only certain qualify as importable into EVAF. Documentation will be provided on how to do this for all supported EVS providers.

R6.6.1 EVAF will allow for a file to be specified for the importing of session data into EVAF

R6.6.2 EVAF will provide a 'preview' feature for the supplied session.

R6.6.3 EVAF will support the uploading of PRS v4.x and PRS v5.x (and TurningPoint 2008 sessions)*

R6.6.4 EVAF will present a form-based interface for verifying/altering the imported data before actual import.

R6.6.5 EVAF will attempt to ascertain as much information as possible about the session and questions for import preview

R6.6.6 EVAF will filter in only that data deemed to have come from course students – other clicker data is removed.

R6.6.7 EVAF will warn when it detects that a duplicate session is being previewed.

R6.6.8 EVAF will only import data where it can determine a session date – either automatically or via manual input of date.

R6.6.9 EVAF will allow the inclusion of an uploadable screenshot per question and/or a web link to the question.

Editable 'Session' information consists of Session Title and Creator (Lecturer). 'Questions' have the following attributes:

- Question No (fixed) – incremented automatically – questions imported in order
- Type (fixed) – one of Multiple Choice (Numbers or Letters) or True/False
- Title – title of question
- Identifier – a unique identifier used for generating unique URLs (optional)
- Correct Answer – one of the choices or 'None'
- Choices – number of choices – depends on question type
- No Responses (fixed) – information about the number of valid responses for question
- URL – URL of the question
- Tags – folksonomy for questions – used by the search filter
- Screenshot – uploadable screenshot

6.7 Edit Session/Question (CM only)

R6.7.1 EVAF will allow the editing of all parameters for the question and/or session as allowed at import stage

R6.7.2 EVAF will allow the deletion or changing of screenshot if supplied already or the addition of an initial screenshot if not already supplied.

6.8 Export Clicker-Data CSV (CM only)

R6.8.1 EVAF will provide exported clicker data in the format of PRS v4.x csv – for all questions and all students – in question order.

R6.8.2a If privacy policy is ‘private’ or ‘summary’ then EVAF will anonymise the data, providing current clicker ids where usernames would normally exist.

R6.8.2b If the privacy policy is ‘full’ then EVAF will provide a full (non-anonymous) export of data.

7 Administrator View of EVAF

Administrators manage initial course setup, staff users and system administration tasks. Administrators can do all that staff members can do and are course managers for all courses. The following requirements are administrators only.

7.1 Managing Courses

R7.1.1 EVAF will allow for the creation of new courses using a simple to-use form.

R7.1.2 EVAF will provide a mechanism for checking course codes with the VLE if the VLE module is installed.

R7.1.3 EVAF will validate and/or limit input to set values where appropriate but will not be overly-limiting.

R7.1.4 EVAF will allow for the importing of previously exported course XML files – allowing preview before final import.

R7.1.5 EVAF will allow the deletion of a single course easily – showing a warning beforehand.

R7.1.6 EVAF will allow a per-course export of course information – so that it can be imported later or elsewhere. This does not include student or question information.

7.2 Managing Users

R7.2.1 EVAF will allow the listing of all users known to the system – including staff, administrators and students.

R7.2.2 EVAF will allow for the creation of a new Staff or Administrator users. A staff member must be created in this way before they can be added to any courses.

R7.2.3 EVAF will allow for editing a user's details – including the ability to change from staff to administrator and vice-versa.

R7.2.4 EVAF will allow the deletion of a staff user. This will effectively remove them from all roles in courses.

R7.2.5 EVAF will effectively prevent the last administrator from removing him/herself.

R7.2.6 EVAF will list all students present in the system, including clicker loan(s) and dates

R7.2.7 EVAF will allow for the manual import of additional students from CSV – augmenting the loans system clicker import. CSV is of a fairly standard form.

R7.2.8 EVAF will allow the removal of ALL students from the system – effectively removing all student-related data from all courses. Ample warning will be given for this devastating action.

7.3 System Administration

R7.3.1 EVAF will allow a manual updating of clicker loans from the automated source easily.

R7.3.2 EVAF will allow the mass-updating of all VLE-updated course students easily – if the VLE module is installed.

R7.3.3 EVAF will allow for basic configuration of the look and feel of the application – including the ability to specify logos, institution URLs to use, etc.

8. Configuration

EVAF has several configuration options that are editable at setup – post-install time – or through configuration files.

R8.1 EVAF will allow for the setup of a source of student loan information from either a remote DB connection (with specified parameters), from CSV file import or SFTP download.

R8.2 EVAF will allow for configuration of VLE host location and credentials for the automated downloading of course student information – if the VLE module is installed.

R8.3 EVAF will allow for the specification of SMTP services for the course email notification system.

R8.4 EVAF will allow an individual email address to be specified for receipt of system notification emails. This can be switched off.

R8.5 EVAF will allow for a way of selecting which authentication mechanism is to be used – EASE/Cosign, LDAP or the simpler ‘application-supplied’ mechanism.

R8.6 EVAF will attempt to obfuscate usernames and passwords to external systems.

R8.7 EVAF will allow configuration of privacy policy to suit an individual institution’s approach to student voting privacy.

9. License & Availability and Installation

R9.1 EVAF will be licensed with an appropriate liberal license based on the open source model (TBD) and so must not contain copyright material

R9.2 EVAF will be made available through a publicly accessible repository such as SourceForge

R9.3 EVAF will provide clear instructions on technical requirements and installation notes to make installation of the software straightforward

10. Version Notes

v1.0: Initial version – compiled on 10th May 2009.

V1.0.1: Minor typos corrected, updated to include notes on installation, availability

V1.0.2: Fixed clarification paragraph on Phase 1, Phase 2 requirements