



Innovative Strategic Partnership
for European Higher Education

ISPEHE

Development of BEP version 2

Participating organizations



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BEP Version 2

Main objectives for the second version of the BEP platform were generating advanced notifications, managing meetings including online lecturing system and a new mobile-friendly frontend. The design for the mobile application was done as a result of the previous output, for BEP version 1. The new responsive frontend resides on top of several new technologies:

- AngularJS (<https://angularjs.org/>) as a structural framework for dynamic web apps. It allows the BEP platform to use HTML as template language and allows extending HTML's syntax to express application's components clearly and succinctly.
- Bootstrap (<http://getbootstrap.com/>) is used for mobile friendly development, to create BEP frontend responsive. Bootstrap is the popular HTML, CSS, and JS framework for developing responsive, mobile first projects on the web.
- Bower (<https://bower.io/>) tool is used to manage BEP frontend development. Bower allows managing frameworks, libraries, assets and utilities used to create BEP. This tool allows to keep tracking of package updates and versions. Bower can manage components that contain HTML, CSS, JavaScript, fonts or even image files.
- NPM (<https://www.npmjs.com/>) is used to share and reuse code. NPM makes it easy for JavaScript developers to share the code that they've created to solve particular problems, and for other developers to reuse that code in their own applications.
- UI-Router angular-ui-router (<https://ui-router.github.io/>) tool is used for routing single page websites. UI-Router core is framework agnostic. It allows the BEP platform to have a client-side router which updates the browser URL as the user navigates through it, as a single page app.

At the same time as developing the mobile frontend, Bep version 2 specifications, work-flow and sequential diagrams were created. In addition to the new frontend, two additional modules were added to the existing BEP: meetings module and advanced notification module. This allowed the BEP backend system to fully support the projected features. After a backend system was developed, the BEP version 2 frontend was developed and as a new component, subjected to a new stress test and new security validation. User manuals were updated with the new functionalities and features of BEP version 2.

One of the main features of the second version of the BEP platform was the online conferencing system, used for online meetings, online lectures, sharing knowledge by using audio, video and a fully functional whiteboard with pre-uploaded slides. The online meetings, use special conferencing system which is based on the open source software project Bigbluebutton. Once an online meeting is running, users are gaining access to many useful features, such as:

- List of the participants, with their cameras and activities.
- A whiteboard which can hold a collection of slides on which drawing text, objects and shapes can be made.
- Quizzes for the participants.
- Uploading custom slides, zooming in and out.
- Chat section, where the participants can share text messages.

In order to ensure sustainability and quality of operations of the platform, a monitoring system has been established, measuring 9 parameters from the server, including response time of the HTTP application, usage of CPU, memory and disk and the load which is imposed on the operating system. The monitoring system submits Warning or Critical alerts if certain thresholds are reached, in order to alert system administrators that preventive or corrective action should be undertaken.

Because all of the partnering institutions already use Moodle as their main e-learning systems, the team decided to draft a technical paper, based on the experiences from integrating the BigBluebutton conferencing system with the BEP platform. This technical paper explains how to integrate the Moodle learning system with the online conferencing system, for online lectures and presentations which can be used on a regular basis, throughout the courses on all partnering institutions and through the BEP platform.

As part of the BEP version 2, advanced notifications have been configured, which are configurable on a per-project basis and can be sent to notify participants in issues when the due-date is approaching, either by a percentage of quantity of days. If the due-date is reached for a certain issue, re-notifications are sent on a regular basis, reminding the users to update the issue and push towards its resolution. The project archive, as a last functionality implemented by the BEP team, allows a whole project to be archived and put aside. If later somebody wants to retrieve the project and access its contents, it can be pulled from the archive and published once again.

In the future the BEP platform will be managed and maintained by the Integrated Business Institute.