

# VALS

## *Virtual Alliances for Learning Society*

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## Abstract

VALS has the aims of establishing sustainable methods and processes to build knowledge partnerships between Higher Education and companies to collaborate on resolving authentic business problems through open innovation mediated by the use of Open Source Software. Open Source solutions provide the means whereby educational institutions, students, businesses and foundations can all collaborate to resolve authentic business problems. Not only Open Software provides the necessary shared infrastructure and collaborative practice, the foundations that manage the software are also hubs, which channel the operational challenges of their users through to the people who can solve them. This has great potential for enabling students and supervisors to collaborate in resolving the problems of businesses, but is constrained by the lack of support for managing and promoting collaboration across the two sectors. VALS should 1) provide the methods, practice, documentation and infrastructure to unlock this potential through virtual placements in businesses and other public and private bodies; and 2) pilot and promote these as the “Semester of Code”. To achieve its goals the project develops guidance for educational institutions, and for businesses and foundations, detailing the opportunities and the benefits to be gained from the Semester of Code, and the changes to organisation and practice required. A Virtual Placement System is going to be developed, adapting Apache Melange, and extending it where necessary. In piloting, the necessary adaptations to practice will be carried out, particularly in universities, and commitments will be established between problem owners and applicants for virtual placements.

*Keywords: Virtual placements, Open Source Software, Collaboration, Semester of Code, Higher Education and Companies alliances, Learning*

## 1 INTRODUCTION

The motivation behind the VALS (Virtual Alliances for Learning Society) project has its origin in a shared need, to forge greatly improved links between higher education students and their teachers, and on the other hand the businesses where those students will find employment in a near future. This way, VALS consortium is representative of a much wider challenge facing European industry in the education of tomorrow’s knowledge workers, and their integration in the workplace.

Large sector of the European economy are now mediated by online communications and collaboration, both within a single company, and in the collaboration between organisations. Nevertheless, mobility of students in placements and internships in companies relies on the local connections, which higher education institutions have developed, and the location of placements is restricted by the high costs of relocation and living expenses at any significant distance from the home institution. The solution is to create virtual placements [1]. These will make use of the technology that drives the professional environment to organise and carry out placements.

The reason this potential has not been fully exploited is that virtual placements have not to date offered experience of an authentic business environment and business problems. Thus, for the approach to be successful, these aspects need to be replicated in a virtual placement.

To achieve this, VALS will build knowledge partnerships between higher education (HE) institutions and companies who will work together on resolving authentic business problems through open innovation [2-4]. The innovative approach of VALS is to leverage virtual placements of students in companies in order to foster entrepreneurial skills and attitudes, and to make use of the results to establish new learning and teaching methods. This will result in the Semester of Code methodology, a sustainable set of methods and processes for creating and managing virtual placements, and for integrating these into innovative teaching and learning strategies.

The VALS focus is, on the one hand, real world business problems, and on the other, education that involves programming. These may be from a wide variety of areas of study, not only ICT. This is a promising area for establishing industrial/educational collaboration, because there is:

- a) established practice of external participation in business, in which software artefacts are developed outside a business, and then applied within it,
- b) a very wide range of real world business problems can be addressed.

Within this context, Open Source Software (OSS) [5] will be used as an enabling technology. This has a number of significant advantages, but nevertheless, the VALS method is extensible to any innovation that is mediated by software, so long as the legal and organisational barriers created by licensing terms can be overcome. OSS provides the means whereby HE institutions, students, businesses and foundations can all collaborate to resolve authentic business problems. Firstly, OSS provides the necessary shared infrastructure: it is accessible to students, and businesses are not constrained by intellectual property or commercial interests, which prevent them engaging with educational placements. Secondly, OSS provides a context of well-established collaborative practice within which authentic business tasks are shared remotely, and beyond the confines of an individual organisation.

Moreover, the foundations that manage the software are also hubs, which channel the operational challenges of their users through to the people who can solve them. This has great potential for enabling students and supervisors to collaborate in resolving the problems of businesses, but is constrained by the lack of support for managing and promoting collaboration across the two sectors.

Thus, VALS will provide:

- The methods, practice, documentation and infrastructure to unlock this potential through virtual placements in businesses and other public and private bodies.
- Pilots, promoting these as the “Semester of Code”.

## 2 DESCRIPTION

Foundational work in virtual placements was done by the Cross Sector Virtual Mobility (CSVM) project, which published a book in 2008 [6] exploring the potential of this approach. However, the EU-VIP project (2009 – 2011 - <http://www.euvip.eu/EU-VIP/EU-VIP/about.html>) [7] estimated in its State of the Art in Support of Virtual Placements that “...fully virtual work placements are still rare. Only two of the partner organizations informed that they had students taking on fully virtual work placements. However, the share of virtual placements out of all placements was still rather low at least according to the statistics (approx. 1–2 %)” [8]. The soon to be launched PROVIP project is one of few current initiatives in this emerging area, and it will develop a collaboration platform to support virtual placements.

The VALS project takes a different approach. Rather than providing generic support for the virtual equivalent of physical placements it focuses on the coordination of collaboration around the creation of shared artefacts. It notes that OSS mediates a vast ecosystem of companies involved in a wide range of industries, and builds its collaborations around this existing practice. There have been prior efforts to promote the use of OSS (e.g. OpenSE), but these have not been integrated with industrial practice. The innovation of VALS stems from recognition of an alignment of interest between three groups of stakeholders, opening up unexploited opportunities:

- Businesses.

- Open source foundations.
- Education institutions, teachers, and learners.

The project vision facilitates this alignment of interest to establish an innovative and sustainable collaborative practice. In its activities VALS establishes a new approach to virtual placements leveraging industrial practice in remote collaboration around the development of artefacts; a new medium for flows of information between stakeholders; and an innovative means for managing this process.

A particularly innovative aspect is the leveraging of the participation of OSS foundations. These have an urgent need to find contributors to the code that they develop and maintain. They have developed sophisticated methods and software with which to gather the requirements of business users, and to express these as self contained projects that can be addressed by contributors. These mechanisms are used in VALS to match authentic business needs of organisations with the contributions that can be made by students, building on methods from the Google Summer of Code. A methodology is established whereby the lessons learned can feed into the content of courses, creating a virtuous cycle. A relevant existing initiative is the Google Summer of Code, which provides stipends to students to work on OSS projects in their vacation. However, while the matchmaking aspects of this initiative are valuable, and will be applied in VALS, there is no recognition of students' achievements in formal education, and the benefits of synergy between education and industry are lost.

## 2.1 Consortium

The consortium of eight is composed of equal numbers of HE institutions and companies (see Table 1) who have a focus on OSS, and is completed by a number of OSS foundations as associate partners who have committed to collaborating in the Semester of Code by providing access to problems and problem owners.

**Table 1. VALS consortium**

Partner no.	Role	Organisation Name	City	Country
P1	Applicant Organisation	University of Salamanca	Salamanca	Spain
P2	Partner	OpenDirective Ltd	Exeter	United Kingdom
P3	Partner	RayCom B.V.	Utrecht	Netherlands
P4	Partner	University of Bolton	Bolton	United Kingdom
P5	Partner	University of Udine	Udine	Italy
P6	Partner	University of Cyprus	Nicosia	Cyprus
P7	Partner	Mindshock S.L.	Montornès del Vallès, Barcelona	Spain
P8	Partner	University of Oxford – OSS Watch	Oxford	United Kingdom

## 2.2 Objectives

The aim of the project is establish sustainable methods and processes for virtual placements, which bring together higher education and companies to collaborate on resolving authentic business problems.

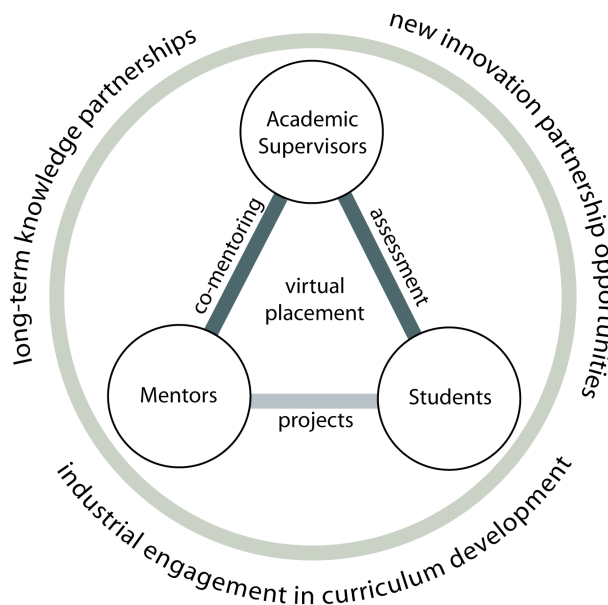
Its intervention is to align and address the needs of the stakeholders involved:

1. Software companies engaged in open source (such as WSO2 and RedHat) and OSS foundations (such as Apache and Outercurve) need to actively solicit contributions from new contributors, including students, in order to remain viable and compete with closed-source offerings.

2. The current level of engagement between universities and the software industry is recognised as being insufficient by:
  - a. Universities, who want to offer authentic teaching and assessment opportunities using current industry best practices.
  - b. Students, who want to obtain relevant experience and to make contacts in the industry that they can use to help start their career after graduation.
  - c. Employers, who are seeking graduates with real-world programming experience and related soft skills such as communicating in distributed project teams and working with contemporary development tools and practices.

VALS creates the Semester of Code, bringing together Academic Supervisors from HE, mentors who are problem owners at enterprises and foundations, and students. Preparation for the Semester of Code, and integration of outcomes into the academic process, mean that each iteration takes place over a full academic year.

Their relationships and the benefits accruing are shown in Figure 1.



**Figure 1. Relationships, workflows and benefits among VALS stakeholders**

The objectives of the project are to:

1. Create an OSS Education Process methodology and guidelines, articulating the collaboration, and providing guidance on the following aspects of student engagement with authentic business projects:
  - a. The process of lobbying for and gathering potential projects.
  - b. Matching of students with projects.
  - c. The pedagogic implications of student engagement with authentic business problems.
  - d. Assessment of student work on authentic business projects.
  - e. Representation and recognition of learning resulting.

2. Generate awareness in industry and education of the opportunities presented by collaboration with student software developers.
3. Establish an online system to manage virtual placements for student developers to work on real-world business problems, with appropriate mentoring. Following the successful example of the Google Summer of Code it brings together:
  - Students who would like to contribute their skills to fix a software problem.
  - Open source projects whose users have requested a feature or enhancement.
  - Mentors who own the problem addressed by the student.
4. Run a pilot programme to demonstrate the effectiveness of this approach, open to non-partners.
5. Evaluate the results of the pilot programme.
6. Establish long-term alliances between universities and companies in Open Source development.
7. Initiate mainstreaming of the project approach, with the provision of persuasive evidence, materials and resources with which to carry the work forward.

### 2.3 Methodology

Resources are applied to stimulate and coordinate the move to new patterns of collaboration around the Semester of Code. All project work revolves around the pilot programme and is directed towards the goal of mainstreaming. VALS components, relationships and WPs involved are shown in Figure 2.

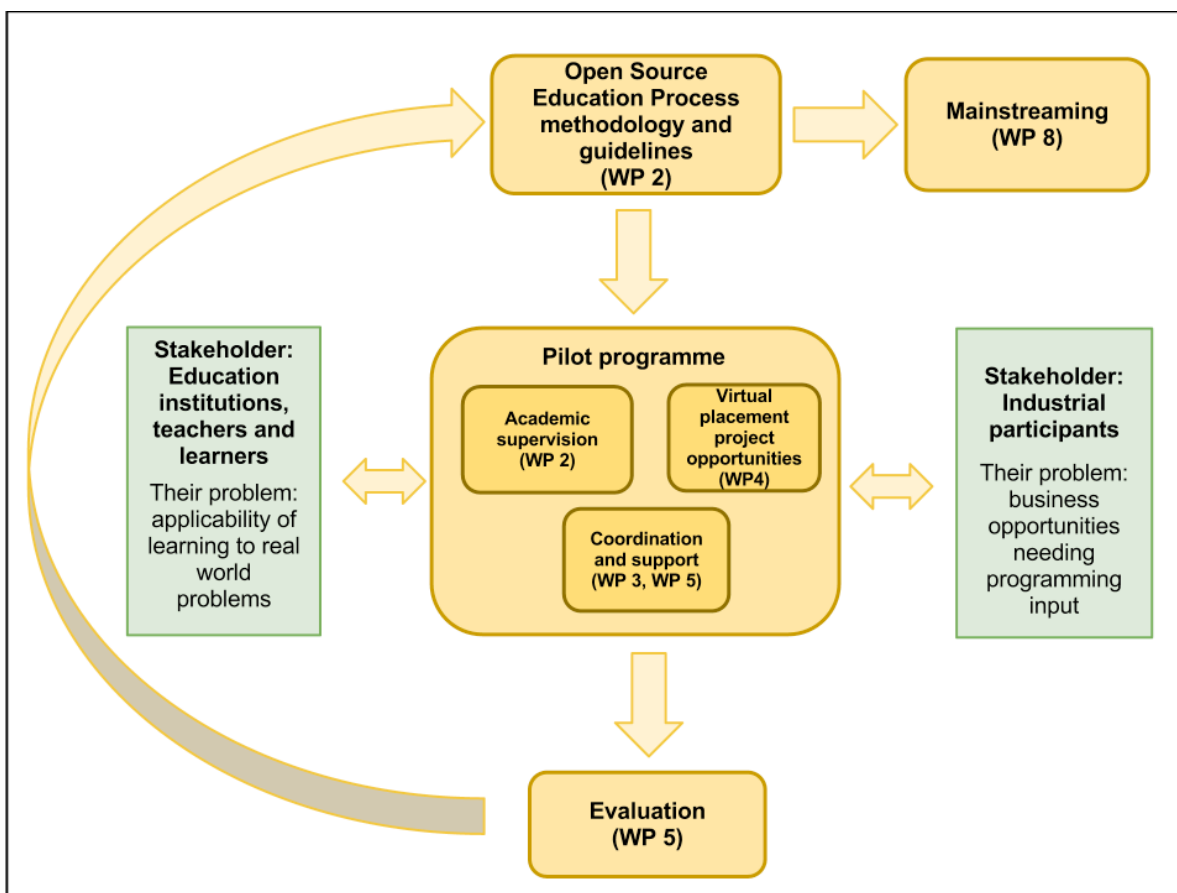


Figure 2. VALS components, relationships and WPs

VALS is organised in the following phases:

**Phase 1 (M1 – M5):** articulation of the pedagogic model for the Semester of Code, with buy-in from both academic and commercial partners. A project intranet and website, Quality Assurance Plan, Mainstreaming Plan and Project Handbook will be prepared. Requirements for Virtual Placement System gathered:

- A pedagogic model for teaching, mentoring and assessment for students engaging in open source project development that:
  - Covers formal teaching, assessment and curriculum design requirements.
  - Includes methods to represent and recognise the learning achieved by students when carrying out their projects.
  - Proves of value to participants in pilots and is accessed by external users.

**Phase 2 (M6 – M9):** preparation for academic partners to deliver courses incorporating the model. Dissemination and evangelism beyond the consortium:

- Virtual Placement System launched:
  - Google Melange platform extended to support HE aspects of virtual placement projects, including supervision, development of proposals, supervision, and assessment.
  - Adapted system published as free and open source code, available to all interested parties. Delivered in English, with easy translation mechanism.
  - Materials available to prepare students for participation in VALS placements.
  - Attracts interest from beyond the consortium.

**Phase 3 (M10 – M20):** Pilot and evaluate the Semester of Code programme with commercial associate partners providing coding project opportunities, and academic partners supporting students participating in the programme. Continued evangelism, and monitoring of the participation of non-partners. A plan for the continuation of the Semester of Code and its associated resources and systems will be produced, in collaboration with the associate partners:

- Semester of Code pilot programme:
  - Major open-source companies and foundations involved.
  - Semester of Code resources positively evaluated by stakeholders.
  - 75 – 100 virtual placement projects established and evaluated.
- The VALS Open Pilot:
  - Participation from beyond the project.

**Phase 4 (M20 – M24):** Consolidation and mainstreaming. Evaluation report published. Practice in HE partners adapted to incorporate the model without project support:

- Post-project iteration of Semester of Code initiated.
  - Guides and didactic materials published under Creative Commons licenses, available at no charge.
  - Adoption of the model by institutions, companies and sectors within and beyond the consortium.

- A book proposal on the Semester of Code.

### 3 CONCLUSIONS

We believe that collaboration on open source development between universities, companies and foundations is a way to achieve all VALS goals in a “win-win” fashion, and long-term alliances. However, while individual lecturers in Computer Science and related subject have engaged with Open Source in an ad-hoc way, there has been little in the way of systematic integrated teaching using live projects. The methodology and guidelines provided by VALS must enhance the effectiveness of all partners operations, and provide a means of transforming significant sectors of educational and industrial activity.

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