Institution: University of Bolton

Unit of Assessment: 36

Title of case study: OMELETTE

1. Summary of the impact (indicative maximum 100 words)

OMELETTE was a project funded under the EC Framework 7 programme under the Future Services theme. The project developed the state of the art for combining web mashups with telecommunications services, building on and contributing towards existing open-source technologies. By combining voice, data, and specialised telecommunications capabilities with web standards, new applications were made possible for both enterprise and consumer users, particularly as these mashups could be created by non-programmers.
The impact of the project from both an industry and scientific point of view was recognised by the reviewers from the EC, who rated the project as “Excellent”.

2. Underpinning research (indicative maximum 500 words)

The framework of the project was developed in a paper titled “From Mashups to Telco Mashups: A Survey”, which was chosen as the Spotlight paper for IEEE Internet Computing (Gebhart et al., 2012). This set out the framework for combining telecommunications services with web mashups.
This was further developed with research on key supporting technologies including interprocess communications in the context of web & telecoms mashups, described in Wilson, Daniel, Jugel and Soi (2012) and Chudnovsky et al. (2012). This work defined the technical underpinnings of communications across web boundaries for technologies impacting telecommunications. For example, connecting selection of a contact with one application using a mobile device address book, with another application capable of sending alerts via SMS or email. The research described two different models for inter-process communications; orchestration and choreography.
These models required different representations for their configuration and interoperability, and different approaches to the design of platforms. This was elaborated on in the technical design work of the project.
As part of the research work a new language was developed for describing mashups at multiple levels of abstraction, OMDL – the Open Mashup Description Language. This was developed using the community-oriented specification development approach described in Wilson (2010).
The applications of the approach developed in the project were also used in other domains, for example within e-learning as described in Wilson, Sharples and Griffiths et al. (2011) and Griffiths et al. (2012).
Overall the project, which lasted 30 months, resulted in 27 peer-reviewed conference papers, 7 journal articles, 9 workshop papers, 1 book chapter, 5 PhD theses, and 9 Masters theses.

3. References to the research (indicative maximum of six references)

Gebhardt, H., Gaedke, M., Daniel, F., Soi, S., Casati, F., Iglesias, C. A., & Wilson, S. (2012). Spotlight-From Mashups to Telco Mashups: A Survey. IEEE Internet Computing Magazine, 16(3), 70. doi:10.1109/MIC.2012.19
Wilson, S., Daniel, F., Jugel, U., & Soi, S. (2012). Orchestrated user interface mashups using w3c widgets. Current Trends in Web Engineering, 49–61.
Chudnovskyy, O., Nestler, T., Gaedke, M., Daniel, F., Fernández-Villamor, J. I., Chepegin, V., Fornas, J. A., et al. (2012). End-user-oriented telco mashups: the OMELETTE approach. Proceedings of the 21st international conference companion on World Wide Web (pp. 235–238).
Wilson, S. (2010). Community-Driven Specifications: XCRI, SWORD, and LEAP2A. International Journal of IT Standards and Standardization Research (IJITSR), 8(2), 74–86
Wilson, S., Sharples, P., Griffiths, D., & Popat, K. (2011). Augmenting the VLE using widget

technologies. International Journal of Technology Enhanced Learning, 3(1), 4.
Griffiths, D., Johnson, M., Popat, K., Sharples, P., & Wilson, S. (2012). The Wookie Widget Server: a Case Study of Piecemeal Integration of Tools and Services. Journal of Universal Computer Science, 18(11), 1432–1453.

4. Details of the impact (indicative maximum 750 words)

The project used an Open Innovation approach, which involved working with existing open source software projects hosted by the Apache Software Foundation. Project innovations were trialled within the consortium but then contributed back to Apache, widening their uptake and impact. Project members contributed sigificant feature enhancements to both Apache Wookie and Apache Rave, making the capabilities developed in the project available to their respective user communities. The platforms were used not only by the consortium members – which included Logica, SAP, Deutsche Telekom, TIE-Kinetix and Huawei – but by the respective external users of the platforms which include US organisations such as MITRE, the Open Gateways Computing Environments, and also by SURFNet (the equivalent of JANET in the Netherlands.)

Through its scientific work the project also identified usability challenges where users are faced with systems that support inter-process communications; these were described in the unpublished paper “Design challenges for user-interface mashups: user control and usability in inter-widget communications” (Wilson, 2012) and explored in several usability studies conducted by T-Systems (a division of Deutsche Telekom) and Huawei in both Germany and China. The results of these studies were released publicly, and discussed with developers of the Apache platforms from multiple organisations.

The technologies developed by the project that have been successfully translated into innovations in use by this range of companies and organisations include enhanced interprocess communications capabilities (including critical usability enhancements), the ability to interoperate with other platforms using an open mashup description language, the ability to interoperate with telecommunications services both via web APIs and through device interfaces (e.g. Android), methods of automatic composition and pattern recommendations, and connecting platforms with shared app stores.

The ability to share mashups as reusable workspaces using OMDL is a notable productivity enhancement, and has also been adopted for use within other platforms including Moodle and LifeRay, as well as within private corporate workflows at TIE-Kinetix and SAP.

Since the project concluded, several other companies and consortia outside the original consortium have begun contributing to the future development of OMDL, including Ascora GMBH, EPFL, and ITEC.

The open approach used by the project resulted in increased impact for technological innovations, and this was recognised by the project reviewers as a major contributor to impact and project success. It has also been the subject of subsequent discussion as a model of best practice for engagement by research projects with the Open Source community, for example in an article by OSS Watch at the University of Oxford (2012).

The impact of the project for its consortia members is nicely summarised by Stuart Campbell of TIE Kinetix: “whilst we have probably been in around 10 projects to date, this is only the second one I can really say I'm sure we will tangibly benefit from”

5. Sources to corroborate the impact (indicative maximum of 10 references)

Apache Wookie http://wookie.apache.org/
Apache Rave http://rave.apache.org/
Omelette Final Dissemination Report http://www.ictomelette.eu/c/document_library/get_file?p_l_id=48742&folderId=157989&name=DLFE-12320.pdf
Open Mashup Description Language (OMDL) http://omdl.org
Wilson, S. (2012). Design challenges for user-interface mashups: user control and usability in inter-widget communications. Retrieved 29 Septebmer, 2013 from http://scottbw.wordpress.com/2012/03/07/design-challenges-for-user-interface-mashups-usercontrol-and-usability-in-inter-widget-communications/
OSS Watch, University of Oxford (2012). “Reaching out: How funded project consortia can work with open source communities” Retrieved 29 September 2013 from http://osswatch.jiscinvolve.org/wp/2012/09/05/reaching-out-how-funded-project-consortiacan-work-with-open-community-projects/