

Chapter XXIII

Technology Exploration: From Ideas to New Services

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ABSTRACT

This chapter presents a technology exploration process designed to support service innovation for information and communication technologies in a university environment. The mission of the technology exploration is to highlight possible applications of new technologies on the basis of prototypes which, following an evaluation phase, are used to develop new services. The exploration process is composed of several stages. In the first stage a number of proposals are generated beginning with the analysis of users' expectations, best practices and technology developments. In the next stage prototypes for selected proposals are implemented. Only the most viable prototypes are then further developed to maturity, providing a reliable service. This chapter is based on the experience gathered by our team over a period of 18 months. During this period six prototypes have been developed, three of which have been further developed to full maturity. The introduction of a voice over IP service for all the university members illustrates the exploration process.

INTRODUCTION

Rapid development of information and communication technologies has a direct impact on all areas of education and research. The amount of knowledge and information that is available

is growing exponentially. Radically new models of cooperation, networking and knowledge exchange are emerging. A well developed and solid Information and Communication Technology (ICT) infrastructure is thus indispensable to support education and research and has become

an increasingly important advantage in the global competition among universities.

The presented technology exploration process was part of ETH World (<http://www.ethworld.ethz.ch>), a program for the development and introduction of technologies to enhance communication and cooperation at ETH Zurich. ETH World was responsible for the evaluation of technological, pedagogical and organizational ICT developments inside and outside the University and for the support testing of promising new technological developments within ETH Zurich. Especially its role was to take the lead in identifying potentially new technological developments. ETH World ran for six years from 2000 to 2005.

The initial innovation process at ETH World was based on a bottom-up approach. On a regular basis ETH World requested proposals. All ETH Zurich units could propose projects to be implemented. After about three years an external peer review (Bates, Bobrow, Ernst, & Hutch, 2003) pointed out some shortcomings of this bottom-up process:

While producing many innovative projects and tools, a number of these projects have been too inward-looking and were not always aware of relevant developments elsewhere. [...] It is important to differentiate between technology invention/development and innovation in teaching. The attraction of inventing/developing technology inside ETH has obviously been a strong pull on many of ETH's engineering spirits but may have distracted from a closer look at technological developments and models of good technology-based teaching practice outside ETH. For instance, it is just as innovative to take already existing technological products and apply them in a new way to teaching and learning. This is less of an economic risk than re-inventing the wheel and developing new technology, which in most cases will require substantial investment and commercial partners if it is to be successful.

On the basis of these findings, the peers proposed the following measures:

ETH World should be encouraged to continuously evaluate technological, pedagogical and organizational ICT developments outside the institution while supporting the testing of promising developments within ETH.

ETH World should take a leadership role in identifying potentially new technological developments in broad consultation across the university. For example, regarding future calls for proposals, ETH World should include a pre-proposal phase to be able to prioritize two or three areas of technological developments.

ETH World should strengthen the external focus of the ETH World program and the individual projects through partnerships, cooperation, technology exploration and transfer.

The management of ETH World reacted to the suggestions with the creation of a new position for technology exploration. In this chapter we summarize the experience we have gained in this position in the last 18 months of the duration of ETH World.

Because of the limited available time, we decided to pursue a very pragmatic approach for the definition of the exploration process and in the daily work. The goal was to come up with results within few months. The resulting process for technology exploration has proved itself and can be used as starting point for similar initiatives.

TECHNOLOGY EXPLORATION

The mission of the *Technology Exploration* is to verify that a given prototype will fulfill its intended task as a new technological application when fully developed. Following an evaluation phase the prototypes are used as a starting point for the development of new services. The exploration process is represented in Figure 1 like a funnel

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