

# Knowledge Transfer from Researchers to Businesses - eXperience and EUREXIS

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**Abstract:** Researchers depend upon business people and vice versa. They profit from each other by means of knowledge exchange: business of all sizes learn by reading about successful and unsuccessful projects and researchers gain insights through sophisticated research activities around aggregated case studies. There are various efforts in Europe directed to support these activities, of which two are discussed in this paper. eXperience is a Swiss project aimed at Swiss researchers and businesses deploying an operational case study platform. EUREXIS is an international Network of Excellence combining research agendas with local businesses and research institutions in Europe. Both projects build upon a common understanding of the e domain: the e business navigator. The e-business navigator is an approach for a common terminology that serves the specific purpose to foster structured storage and accessibility of knowledge about e-business best practice.

## 1. Introduction

eXperience is a national database for e-business case studies set up by the University of Applied Sciences Basel, Switzerland (FHBB) and mandated by the Swiss State Secretariat for Economic Affairs (seco). eXperience is a national project and results are made available to the public. It is a success story that is going to be transferred to an international level by means of EUREXIS (EUROpean EXperience In e-business) and enhanced with a research agenda supported and carried out by international research institutions in collaboration with European businesses. This envisioned network is already in the making and partners are lined up. However, there are several issues related to the launch of an international network of this size and reach, and this paper addresses the issues and tasks that (1) were successfully mastered and (2) are still pending. These issues are of rather different sorts than those compared to networks of practice or communities of interest as described in [1].

Both project and network activities are focused on case-based research on one hand, and managing knowledge to support innovation and business strategies through sharing, exchanging, and quality control of knowledge and intellectual capital in the area of e-business/e-government on the other hand. More specifically, it involves establishing relationships with SMEs and government agencies in order to collect case study material and good practice in Europe, NAS, and EU-affiliated countries; authoring and translating case studies in research institutions; editing case studies written by research institutions in other countries; integrating international research in the areas of e-business and e-government; and networked researching amongst SMEs and research institutions.

Figure 1 provides an overview of the concepts:

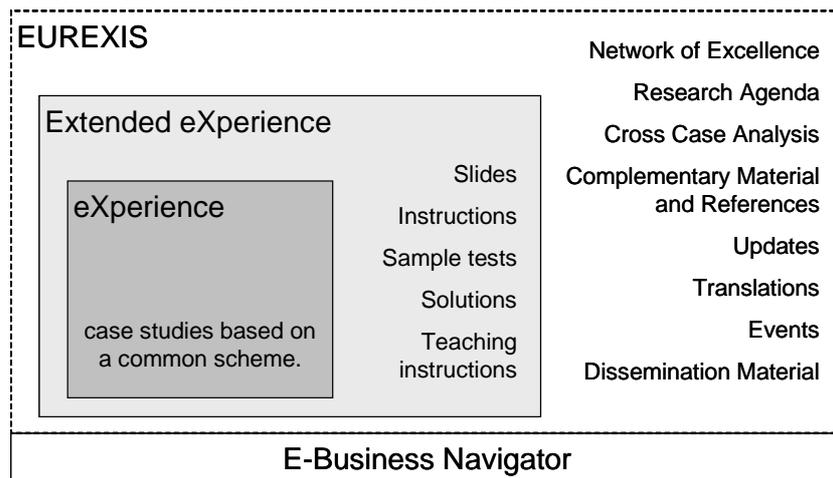


Figure 1: Nesting of concepts

## 2. Objectives

Case studies are “an intensive, detailed description and analysis of a single project, program, or instructional material in the context of its environment” [4]. A case study can be applied in almost any setting where the curriculum spans parts of real world phenomena. Case studies foster online and offline collaboration on problems discussed and therefore lend themselves to being used in traditional and blended learning. Researchers can get easy access to case experts and the tacit knowledge that otherwise remains undocumented.

For many years, researchers in these fields have recognized shortcomings of traditional research strategies in dealing with the high complexity and richness of phenomena in real world business scenarios. Today, case study research goes far beyond portraying isolated pieces of evidence, but has become an established methodology of theory building (for an early, but very comprehensive review see [3]). Especially European research with its tendency to a more qualitative analysis has extensively embraced the case study approach.

There are various efforts under way trying to consolidate research efforts in Europe. One is built upon the preliminary work of eXperience and goes beyond the borders of a single University expanding to a network: EUREXIS (see [7] for the full proposal; related efforts include e.g. EBRN). Joint research efforts such as EUREXIS are only possible if all involved academic constituencies agree to a common understanding of the e-business landscape. Therefore, the e-business navigator has been proposed as the common thematic ground of both eXperience and EUREXIS [8]. The objectives of this paper are threefold:

1. To outline and comment the concept and lessons learned from the eXperience project;
2. Summarize and comment on the lessons learnt from the onset of the idea of a network to the actual problems and tasks at hand;
3. Describe the idea of an e-business navigator.

## 3. Methodology: From the Raw Material to the Case Studies

Within the context of this broad range of existing activities and traditions, eXperience takes a clear position described by three points of view. First, it is necessary to have a clear focus on e-business / e-government. This is a field characterized by rapid development, a wealth of innovation, a high demand of consulting and advice in the corporate sector, a strong need of up-to-date teaching material in the educational sector, and a lack of theory in research and academia. Moreover, it is important to pave the way for strong integration of business / governmental activities and research in the case development phase plus business research and education in the case exploitation phase. Last, the above two mentioned goals will only be achieved if a symbiosis of efficient case representation and retrieval mechanisms is built

in addition to the invaluable contribution of human experts who actively carry case knowledge into practice, teaching, and research. The core of such representation and retrieval mechanisms is an integrated and scalable case study database.

The case study database eXperience themed “sharing success” is the leading case study offering in the German speaking area. Experts deliver insight into their solutions to specific and broader problems. As of June 30<sup>th</sup> 2004, there are 193 case studies in German, sixty in English, and twelve in French. The University of Applied Sciences Basel (UAS Basel) developed the concept, the technical architecture, the application design and programming, and the editorial processes, thus effectively reducing costs by deploying existing know-how and the technical framework of the Institute of Business Economics at the UAS Basel.

The process for preparing and editing the case study is established and well documented for the Swiss platform eXperience, which is the precursor for the European platform EUREXIS. It starts with authors submitting case study material online. An editor classifies the content and checks if the eXperience requirements are met. These requirements are:

1. Is the solution realistically described and portrayed in detail?
2. Are the following questions answered sufficiently according to the case study scheme [6]: Who? What? When? Why?
3. Are the solution providers named?
4. Do the authors provide diagrams and charts?
5. Is there a management summary?
6. Is the online and offline publication right explicitly granted?

In a next step, the assigned editor coaches the author in the writing and wrap-up process. Furthermore, the editor assigns keywords to the case study and then classifies the content according to the four dimensions “economy and management”; “functions and processes”; “technology”; and “design and interaction”.

The last step is to insert information about the author, solution provider and solution partner. The combination of all information allows for specific database searches, such as by keyword (e.g. value chain), sector (e.g. Catering Trade/Leisure/Tourism/Culture/Sport), operational area (e.g. e-procurement), focal point (e.g. functions and processes), technology (e.g. UN/EDIFACT), IT products (e.g. IPEC), or by IT contractors (e.g. Triamun). These preprocessed listings combined with a comprehensive full text search including selected indexed words are the key requirement of the database sponsor seco, to which the described editorial activities pay a significant contribution sine qua non.

Setting up of a European network focused on case study acquisition, processing (editing and research), and dissemination has related issues in terms of its core content (i.e. case studies), but the administrative, research, and support tasks are much broader and on average more difficult to put under one roof. This entails member acquisition, scientific and organizational objectives of a research network, and finding relevant funding sources.

Member acquisition was not particularly difficult and a matter of a short period of time. The idea of a European Research Network of Excellence (NoE) was very well received among its current members and the number quickly exceeded twenty institutions. The definitions of the scientific and organizational objectives on the other hand were more difficult to agree upon. This process is in fact not yet finished and probably will never be, as these issues need adaptation as the network adapts to the changing requirements of the time being. The set-out is the work packages defined in the proposal submitted to the European Commission in 2003 (details see [7]). Yet by far the most difficult task is the funding process. A first attempt in the IST priority of the Sixth Research Framework (FP6) of the European Commission was promising, but not yet successful. Other activities in the direction of COST did not yet yield positive results either as of April 2004.

The two above-mentioned objectives reach onward to and are at the same time based on a common understanding of the underlying e-business concepts. The proposed navigator

(see Figure 2) is a chart subdivided into three layers: management, applications, and technology, each of which contains terms with defined notions [8]. Actors comprise business partners, customers, administration and agencies, citizen and companies, procurement and sales, research and development, and operations.

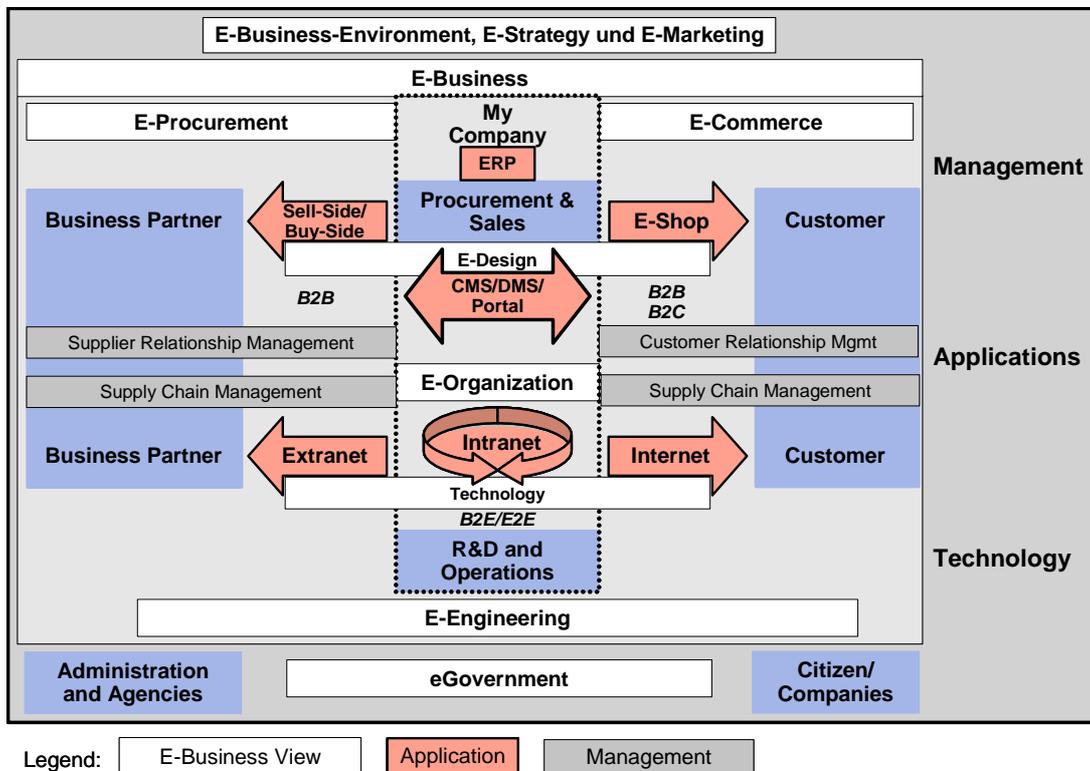


Figure 2: E-Business Navigator

The common classification scheme structures relevant knowledge and make it available to interested researchers and practitioners. One of the objectives is the creation of a common language for stakeholders. EUREXIS is in the making and will advance the discussion about the common e-language and e-understanding. This network will work with the classification scheme and validate its use and implementation in the time to come.

#### 4. Technology Description: Case Study Platform

The eXperience platform is based on Lotus Notes Domino and is the prototype for the EUREXIS platform. This will be extended as presented in Figure 2. An intermediate step is the extension of eXperience using didactical material. The "Extended eXperience" adopts the basic source database set-up and has additional material attached. The Web front end (see "Relevant Web Sites") informs the visitor about availability of slides, instructions, sample tests, solutions and teaching instructions (how to write teaching material is described in [2]). Information about target markets, language and year of publication are displayed. The extended material encompasses discussion possibilities and update/feedback services. The Web front end has a powerful back-end input interface. Currently, this is realized using a Lotus Notes client. Editors and selected authors provide their input via an elaborate form segmented into different sub sections: general information; information about authors and editors; details about providers and operators; the case study text and its meta data; change history; the case study classification; and teaching material uploads.

To illustrate the path of a possible user query, take the example of a teacher looking for a case study with supplemental class instructions and test questions / solutions. The average case study focuses on implementation of an e-business application. Via the extended eXperience homepage, the teacher may look for the keyword that closely matches his focus:

e.g. “e-shop”. He clicks on the word on the chart displayed on the homepage and is directed to a list of possible case studies with detailed classification and meta information for each list entry. He chooses the best match to his needs in terms of content and availability of didactical and dissemination material. He can print and/or download the material and use it in class. The copyright of eXperience is included in the material and must not be removed (user agreement). The copyright remains with the platform operators & case study authors.

## **5. Results: from eXperience to EUREXIS**

eXperience as the precursor to EUREXIS, offers valuable insight in relation to larger scale requirements to be considered. However, the opportunity costs are very high, if not too high, for many micro-enterprises. Even though they have presentations and project documentation of success stories at hand, integrating them into a case study is usually too expensive. SMEs often have the necessary means and material to publish case studies in the eXperience sense. Marketing budgets are frequently allocated and texts and figures come in publishable form and shape. As a rule of thumb, every one out of ten enterprises contacted by the eXperience team submits one or more case studies. In most instances, solution partners are the primary applicants who submit their implementation examples.

Another result of eXperience is that the editorial work takes up more resources and time than planned. The more practically oriented case study authors are, the less willing to invest into verbalization and submission of a case study they seem on average. Furthermore, authors most often neglect or underestimate the complexity and efforts needed to write a case study. Collaboration between editor and author requires much time and it takes up to eight weeks to publish a case study, whereby the overall case study quality varies to a great degree. The mere case study recording into the database typically takes up two to three hours. The subsequent editorial work depends upon the type of a case study:

1. The quality of university case studies is usually good. The overall work from input to publication is about three and a half hours. Half of the time is spent on editorial work.
2. Case studies written by specialists are less problematic. The overall work from material input to publication is about four hours. Half of the time is spent on editorial work.
3. The quality of company case studies varies depending on the authors' qualifications.

One out of five studies will be withdrawn. Editorial work involves three to four hours.

E-business projects can contain confidential information (e.g. security concepts). Such information must not reach the public and the editors offer authors a customized publication of their case study. Before such a case study will be published, a detailed agreement is set up listing which content may be used and the parts that will not be published. A specific solution operator may for example not be named but “company X” will be used instead.

If a company cannot provide the resources to write a case study, the editors recommend approved and reliable authors. They document a project, complying with the eXperience requirements and specifications and charge CHF 2000 – CHF 2500 per case study.

The database and the website content including sixty existing case studies were translated from German to English in September 2003. The French and German websites were updated. Two factors determined the success of this transfer project. First, the quality of the case study translations influenced significantly the work of the case study entry by the editors. A rigid project management solved most of these issues in order to comply with the tight schedule. Second, technical terminology is commonly an issue with regards to linguistic quality assurance. An English lecturer (native English speaker) of the University helped with the process. In a first step, the key word list and the synonym catalog were translated. Secondly, the editors wrote the translation guidelines (i.e. order of submitted material, etc.). Last, the editorial team controlled the translated material on a regular basis in cooperation with the lecturer issuing a written quality control report. All material was made available to the translators promptly upon completion.

The project ended successfully in February 2004. The overall costs for the English website including the entry of sixty translated case studies amount to roughly CHF 40'000. The effective translation costs for the sixty case studies added up to about CHF 100'000.

## 6. Business Benefits

There are no numbers and figures about direct business benefits for case study providers or authors. At best, the influence can be estimated indirectly and is directly attributable to the marketing effect by enhancing name recognition. Case studies by definition do not offer a silver bullet to foolproof business cases, but rather provide access to structured knowledge. Therefore, the primary goal of the described project and network activities are geared towards optimized material acquisition and case study dissemination.

The constituencies of eXperience and EUREXIS in the dissemination process, the most important process in the value chain from a company's point of view, are the dissemination partners, academic partners, and small and medium enterprises. Each of them interacts with the database in a defined yet unrestricted way. As illustrated in Figure 3, all partners have access to the database, though dissemination actors fulfill a more prominent role than the dissemination partners: they help SMEs to understand and apply relevant information to their specific situations and needs. Dissemination actors may in turn get access to further case study raw material, consequently fueling the case study acquisition process.

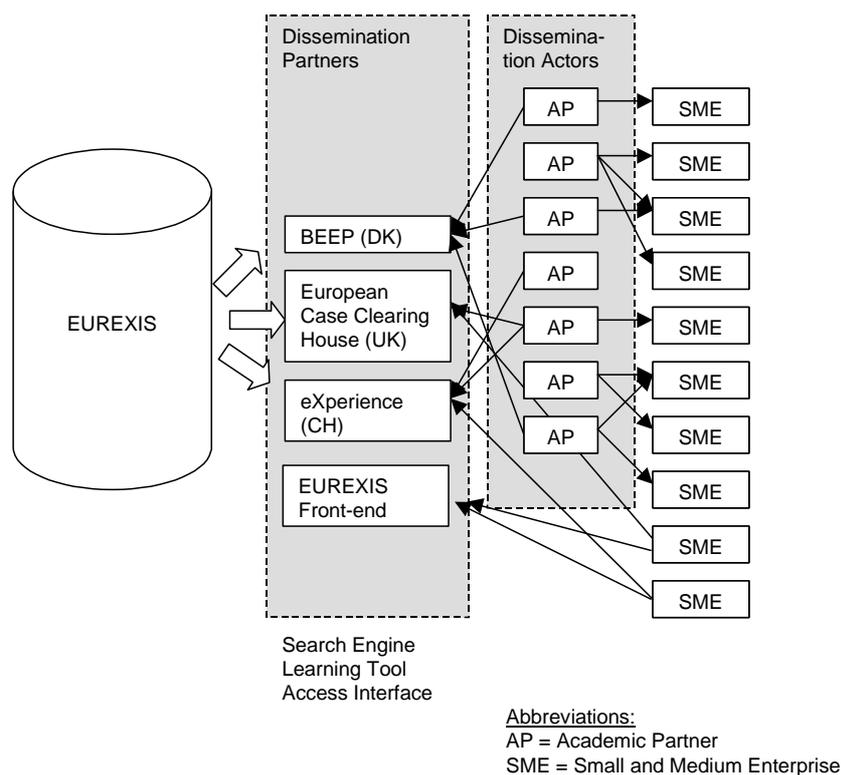


Figure 3: Dissemination: Integration and Interaction of the EUREXIS Constituencies

## 7. Conclusions and Lessons Learned

The e-business navigator is an approach for a common terminology that serves a specific purpose: to foster structured storage and accessibility of knowledge about e-business best practice. Representatives of the Ecademy member schools in Switzerland are already using the classification scheme on a national level in classes and projects (for a description of a project see [5]). Furthermore, the eXperience project successfully implemented the

e-business navigator as an access interface to case studies [8]. The growing number of case study queries to the database gives evidence of its usefulness for research and practice.

The navigator approach will be taken a step further into the European research agenda through EUREXIS, which will carry out meta-research on case studies and cross-analyze the accumulated knowledge, for which the e-business navigator lays out the structured core. This is the basis for further discussion & refinement of the proposed classification schemes.

A very important goal of the Swiss project and the EUREXIS network activities lie in the socio-economic objectives: the transfer of experiences in an optimized form from industries and universities across the boundaries of European countries. This goal is met for the Swiss market, but it has not yet been met on a European level.

There are a few lessons the project teams learned the hard way. The most difficult part is finding funding sources. The IST Priority in the current Sixth Framework Programme (FP6) is very difficult to address as a funding source because the definition of “Network of Excellence” (NoE) remained rather fuzzy for the consortium, setting the ground for long and not fully resolved discussions. In addition, a very large number of NoE applications overwhelmed the European Commission, setting the threshold at an extremely competitive level. Another issue is network management: without reimbursement, upfront initiatives are kept low amongst network members. However, most discussion partners at agencies and research institutions readily acknowledged that knowledge imparted by the local research institutions will help companies, agencies, and academics to build the necessary IT infrastructures for the support of organizational networking (e.g. virtual organizations), design process integration (e.g. linking legacy systems with modern e-business applications), and enable the sharing of resources (databases and applications). Also, the integration of business processes between government and small business has been identified as a key area of interest (see for example the two European projects COCONET and VOOMAP), which is a great encouragement for the teams despite all obstacles.

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## Relevant Web Sites

eXperience (<http://experience-en.fhbb.ch>)

Extended experience (<http://experience-en.fhbb.ch/cases/caseteach.nsf>)

EUREXIS ([www.eurexis.net](http://www.eurexis.net))