December 2007

The eXperience Methodology for Writing IS Case Studies

Petra Schubert
University of Koblenz-Landau

Kumar Bhaskaran
University of Applied Sciences Northwestern Switzerland

Follow this and additional works at: http://aisel.aisnet.org/amcis2007

Recommended Citation
http://aisel.aisnet.org/amcis2007/345

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2007 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
THE eXPERIENCE METHODOLOGY FOR WRITING IS CASE STUDIES

Petra Schubert
Institute for IS Research
University of Koblenz-Landau
petra.schubert@uni-koblenz.de

Ralf Wölfle
Institute for Information Systems
University of Applied Sciences Northwestern Switzerland
ralf.woelfle@fhnw.ch

Abstract
eXperience stands for the method of imparting authentic knowledge concerning information systems in the form of case studies, practiced since 2000. Its core consists in the collecting and editing of empirical best-practice solutions following a uniform structure. The methodology encompasses a uniform template (grid) for the presentation of case studies as well as a scheme for a common terminology in the domain of business software. We present the template with a focus on the four different views (business, process, application, technical) and discuss the use of uniform graphics for each of these views. The final chapter gives an overview of current activities around the eXperience initiative.

Keywords
Case Study, Case Studies, Methodology, Information Systems, E-Business, Terms, Definitions

Case Studies as a Research Methodology
There has been much discussion in recent years whether or not case studies are a valid instrument for the generation of research findings. Case studies are particularly suitable for understanding phenomena within their organizational context (Yin 2003). Klein and Myers (1999) performed a study and concluded that “case study research is now accepted as a valid research strategy within the IS research community”. Besides, case studies have long been used as a teaching method, especially in the area of managerial sciences (Bonomo 1985; Eisenhardt 1989; Huff et al. 2002).

Bonomo (1985) pointed out that case studies in social sciences have been used for both (1) validating existing theories and thus deducing empirical consequences and (2) building theory by using inductive principles. The eXperience methodology which will be presented in this paper follows the second approach in trying to identify new and previously unknown effects of the use of business processes which are supported by ICT.

The often used Eisenhardt framework includes the entire process of building theory from case studies from getting started to the actual derivation of new theory. Case studies written with the eXperience methodology have been successfully used with the Eisenhardt framework in the past (e.g. Risch/Schubert 2004; Schubert 2007).
The eXperience Methodology – Dissemination of Knowledge With Case Studies

The eXperience methodology has been successfully used for more than seven years and has been described in parts previously (Sigrist et al. 2004; Schubert/Wölfle 2006). In this paper, the method will be described in its entirety for the first time. For examples of case studies written in the eXperience methodology see Voss/Schubert (2004) and Schubert (2006).

The Competence Center E-Business Basel decided in 2000 to foster knowledge transfer in the area of information systems and e-business by means of case studies. In the course of this, the case studies were to be developed so that they were, as far as possible, standardized to a defined system so that, through the systematics, also theoretical knowledge in the form of terms/concepts, context and schemata could be implicitly communicated. The method which emerged from these considerations bears the name “eXperience”.

The case studies communicate experiences from practice and show the context in which the statements are valid. The reader can then decide whether the experiences can be applied to his/her (particular) situation. A case study is authentic, that is the readers can recognize which experiences are relevant to them, and they can decide whether to trust the author and can even contact him or her. eXperience case studies contain real practical knowledge. They show how and why something was done and what resulted from it. The reader gains thereby an ability to judge and act.

Independent authors obtain the contents of the case studies directly from the representatives involved in the IT project in the portrayed companies. Documentation is carried out with the help of a standard system (a case study grid), which is presented in the following sections.

Every year, a search for companies is carried out which are prepared to report their experiences with ERP systems projects in several interviews carried out by representatives from different universities (the authors). A public appeal is made, known as a “Call for Cases”, followed by an evaluation carried out by the eXperince research team.

Parallel to the Call for Cases, authors are asked to apply to write the case studies. The selected authors are invited to an “authors’ training day” where the “eXperience method of writing case studies” is presented by experienced eXperience case study writers. An overview of the research steps is given in Figure 1.

![Figure 1: Research steps](image)

The interviews are led with the project managers who are in charge of the introduction and maintenance of the business software (ERP system) in the portrayed company. The authors visit the selected company and gain insights from project managers, users, as well as from the responsible IT partners. The interviewees grant access to non-sensitive internal documents relating to the project management, including investment plans, roll-out time, statistics, and so forth. In addition, information is collected from later e-mail correspondence regarding feedback on the texts written, archival records, and publicly available Web pages. These in turn help the researchers to validate and enrich the information gathered from the interviews. Each interview lasts for about two hours. Some authors use a tape recorder, others only take notes. The transcription takes place at a later point in time when all material is compiled. The first versions of the case studies are then sent to the editorial team (cf.
Feedback regarding violations of the default template (cf. Figure 4), mistakes in the methodology of graphics, and missing or more detailed information are given and the authors are asked to correct and extend the transcripts.

After the first feedback round the case studies are sent to the interviewees for review and are revised based on their responses. After that, another round of comments from the editorial team follows. The interviewees are asked to give their consent to the final (proof) version of the case study (“good for print”).

Once all case study transcripts have been completed, they are analyzed using the basic structure (the template) in which all case studies are written. The cross-case examination reveals certain common patterns. In the next step, groups of case studies are formed that show similar differentiating factors (e.g. excellence factors) in their processes.

**Channels of Knowledge Dissemination**

Case studies are sought annually on a (specific) focus topic. The focus topic is determined at the beginning of every year by the Competence Center E-Business Basel and its partners. Afterwards, the public “Call for Cases” is launched. In the following selection process, those projects are identified which are most suitable for knowledge transfer in the defined focus topic. The case studies which are drawn up are made publicly available through three different channels. They are published in a reference book brought out annually by Hanser Publishing. A selection is presented at the specialist congress ”eXperience Event”. Additionally, the case studies are included in the eXperience Case Study Database by the eXperience editors, and are categorized and provided with headwords (www.experience-online.ch).

**Documented Knowledge**

The case studies drawn up in this way constitute, along with the system, an up-to-date knowledge representation of the respective focus topic. All case studies can be obtained through the online case study database eXperience-online.ch. Additionally, around 15 case studies are published annually in a book.
Personal Knowledge Transfer

A personal encounter with experts always has a greater impact on an interested audience than reading a book. That is why the Competence Center E-Business Basel has hosted the conference “eXperience Event” every year since 2000. Eight of the around 15 case studies portrayed in the book are presented at the eXperience Event. The program is addressed primarily to management members, decision makers in business processes and software evaluation, users of business software, consultants and lecturers.

Online Knowledge Query

“eXperience online” (www.experience-online.ch) is the largest online knowledge database for IT management and e-business case studies in the German-speaking world. Broad expertise from more than 300 implemented projects is freely available here. The publication of case studies is free-of-charge, if the case study fulfils the conditions set by the editorial team as regards its knowledge transfer.

The eXperience Systematic

The following chapters describe the special eXperience systematic for writing case studies.

The E-Business Navigator: A Systematic Overview of IS Terms and Definitions

The technical papers and case studies in the annually issued eXperience books consider business models and business processes in interplay with business software. The term business software is used as an umbrella term for all kinds of business (management) software. It includes therein ERP systems as well as E-Business software.

Figure 3 provides an overview of the terms with mention of the management concepts, applications, and involved parties. It is a general framework to describe the systematic of business software and corresponding management concepts. Within the figure is a view of a specific company in the centre (sketched through the dotted line). The company has an ERP system at its disposal with which the activities in various departments can be integrated. At the same time, the ERP system is almost always the connection point for the integration of external applications. A detailed discussion of the overview of terms in the context of business software can be found in (Wölfle/Schubert 2005) in German and (Sigrist/Schubert 2004) in English.
E-Business entails the support of enterprise relationships and processes among business partners, customers, and employees by means of electronic media (Schubert/Wölffe 2000). Usually, the term “e-business” is related to the deployment of new media and internet technology.

E-Commerce is a specific part of e-business and is focused on the selling of products and services. E-commerce applications support sales processes, traditionally subdivided into information phase, agreement phase, and transaction phase (Schubert et al. 2001).

E-Procurement is the electronic support of buying processes (purchases) of a company (Schubert et al. 2002). Enterprise Resource Systems (ERP) are usually optimized for the procurement of direct goods, while e-procurement solutions also support the purchase of indirect goods.

E-Organization focuses on the electronic communication support among employees or between employees and business partners. Software packages are used for collaboration with partners (collaboration tools and Internet groupware). Furthermore, companies establish and expand content management systems in order to manage increasing amounts of information in portals, Web sites, and e-shops. Mobile applications support field staff and facilitate remote access to product catalogues and customer data including mobile order entry.

Specialized software abets management concepts such as Customer Relationship Management (CRM) and Supplier Relationship Management (SRM).

Customer Relationship Management is sales oriented and targets customer needs and satisfaction. Its objectives are an increase of customers and the optimization of the customers’ lifetime value (sales volume of cumulated purchases).

Supplier Relationship Management, on the other hand, is geared to procurement. The focus lies on extensive support of the relationships and processes in conjunction with suppliers.

Supply Chain Management is the coordination of a strategic and long-term collaboration between companies in the entire value chain from the development, manufacturing to the selling and recycling of products and services. This includes production and procurement as well as product and process innovations (Schönsleben 2004).
Uniform Case Study Structure

Some eXperience case studies are drawn up yearly within a book according to a uniform structure (using a common template). The structure is refined every year and adapted to the respective focus topic. The rough structure is, however, the same in all eXperience case studies. In the first chapter, the background of the portrayed company is presented, its business sector, the products it offers, its target group as well as its vision.

In the following chapter, the reasons for the project are presented – in this context also the significance of e-business in the company strategy, the interplay between the ERP system and the e-business software (if existent) as well as the involved partners. Chapter three describes the actual (software) solution and outlines the solution from the following views: business, process, application, and technical view. Following this, the implementation aspects are addressed. The steps towards the creation of the software, as well as the technical platform, are outlined briefly.

Figure 4: Uniform case study structure that all authors adhered to (year 2007)

In the fifth chapter, experiences from the operation are described. Here, the task allocation for the operation of the entire system becomes clear. Costs, benefits and profitability of the solution are evaluated according to the achievement of objectives. The concluding chapter summarizes the important factors that are necessary for success. The specialties of the solution, the decisive changes as a result of the implementation project and the lessons learned by the people who were involved in drawing up the case studies are exemplified.
Case Study Views

Every business solution using business software can be regarded from different perspectives (views). In order to assist the reader’s orientation in the case studies, the authors supply a uniform structure as a basis for the description of the solution (see Figure 5). The Business View describes the involved business partners and their roles and objectives. The Process View examines the process sequences and describes one or two central processes in detail. The Application View describes how the solution is distributed among the involved information systems and how its integration takes place. The Technical View considers the involved system components and their arrangement in the network. The individual views are dealt with in more depth in the following sections, whereupon the systematics of the graphics used is also presented.

![Figure 5: Four views for the description of case studies](image)

Business View (Business Scenario)

In the business view, the value constellation of the business partners is displayed. It represents therein the relevant extract from the business model needed to understand the project. The contribution of the different partners and their activities are shown. At the same time, their relationships and the documents that are exchanged are presented. It should become clear how the involved parties work together and which objectives could be associated with the supporting software solution.
In each case study the overview of the project is presented with the Business Scenario, as exemplified in Figure 6. Therein, the relevant details of a market schema, the part of the supply chain, the cooperation in a concern or merely the cross-department cooperation in a company which are relevant in the discussed context are shown. Summing it up, the business scenario shows the involved parties in their roles, the most important processes and the business context.

**Process View**

Whereas the business scenario structures the individual business processes in their context, the process view deals with selected processes in more depth. In the graphics describing selected focus processes, the method of the event-driven process chain (EPC) can be seen. The EPC methodology was developed at the Institute for Information Management at the University of the Saarland (Keller et al. 1992) and is used in a simplified form in the eXperience case studies.

The event-driven process chain stands out for connecting several views of the process in a relatively well-structured and concise way. Four of them are necessary for the description of the specialized concept of an information system: the data view, the function view, the organization view and the control view. The model elements can be seen in Figure 7.
Process:
A process is the specification of a sequence of tasks which is defined for the production of a product or service. Every process has a start event and an end event.

Event:
An event is an achieved condition which is relevant in the respective context. An event can trigger tasks. However, it is passive itself and neither needs time nor costs.

Task:
A task is a coherent bundle of activities which contributes to the overall added-value with a defined (pre-)product or service. A complex task can be shown in more detail in a separate graphic.

Control flow:
The control flow describes the temporal and logical dependences between events and tasks.

Connectors:
Connectors indicate logical operations at process splits and reunifications:
- AND: and connector / conjunction
- OR: and/or connector / adjunction
- XOR: either-or connector / disjunction
- DT: decision table [Rosemann 1996]

Process link:
A process link shows that another process is initiated at this point.

Figure 7: Model elements of the extended event-driven process chain (eEPC)

The event-driven process chain includes the current conditions of a process in the illustration of the task chain. Conditions are depicted as events, in which an event signifies the occurrence of a certain fact. This fact can be stored as information in an in-
formation processing system. This, or the events triggering a process, can be, accordingly, certain characteristics (values) from data. For example, the decrease of an article inventory to a certain value can trigger the event “stock is below minimum level” and activate an order process. Also within a process, every single task is triggered through one or several events. A task contains one or several operations performing on a process object and transferring this from the entry condition to the exit condition. The exit condition is interpreted as a new event and a data variable can adopt a new value with the processed object. A task “carry out order” would lead, for example, to a process object “order” being created and after completed task execution the status “order is processed” would be accepted. Events can, therefore, trigger single tasks or entire processes. These in turn result in a new event. The identification of conditions as an entry, exit or intermediate event makes the breakdown of large main processes into meaningful sub-processes simpler.

Conditions are suitable for descriptions of process crossovers (interfaces), as they occur in transfer of responsibility from one sector to another or in the integration of two information systems. In order to broaden the potential of the grouping of several views in a process figure, the EPC was further developed into the extended event-driven process chain (eEPC). The extension consists of the association of supplementary information to the EPK, e.g. input/output activities, affected information objects and data on the organization and information systems (c.f. Figure 7).

**Application View (Distribution and Integration of the Systems)**

The application view considers the involved information systems and their distribution in the presented roles in the business scenario. A software application is therein understood as a logical entity from the user’s perspective. One conceivable distribution of the application onto several technical systems is dealt with in the technical view. The schema used (Schubert 2003) shows the distribution of the most important functions and data, which is important for understanding the responsibility sectors, dependences and thus the risks of the solution. By differentiating the systems into the three layers, namely data management, business logic and user-interface, it is possible to show on which level the integration takes place.

The schema is elucidated with the following example scenario (see Figure 8): A trading company in a consultation-intensive B2B market segment wants to fundamentally improve its position in the market. This is to occur through diversification, increased delivery capacity as well as faster and more efficient processing of orders and tasks, both on the customer level and in the company itself. Figure 8 shows the solution scenario drafted for these requirements, the application systems involved and their integration. An e-shop is to offer the customer a convenient one-stop-shopping, it is, however, exclusively accessible via a Web browser. In addition to a great deal of information about the products, the customer-tailored prices and the current availability must be displayed. This is achieved by selecting an e-shop (an e-business module) which is part of the product family of the ERP system and directly accesses the application logic of the ERP system via a system-internal, proprietary interface. In order to increase delivery availability, an integration with the sub-supplier is arranged. With three of those suppliers, which can cover 80% of the procured products in total, a 1:1 integration on the level of the ERP systems is set up. With the help of the integration interfaces, orders and article availability are synchronized several times an hour.
Technical View

The technical view describes the distribution of software applications on hardware systems, their integration in a network environment or a group of networks as well as specifications of the software systems. Depending on the particularity of the individual case, it can (also) deal with further aspects.
The scenario shown in Figure 9 exemplifies the distribution of the time and performance reporting system TimeCollect onto several networks, zones and systems. TimeCollect is an Internet-based application for the recording of employees’ working hours and was used by the FHBB for time and performance recording.

The discussed computer systems are represented in Figure 9 by uniform graphic symbols. In separate tables, the systems can be better specified with supplementary information for hardware, software (e.g. operating system) etc. Data for hardware and software characteristics of the systems are commented on by the number of users for which the systems were designed.

**Current Work and Limitations**

The eXperience methodology has been specifically designed for the collection and the transfer of best practice experiences in electronic business projects with a focus on the special needs of small and medium-sized enterprises (SMEs). The methodology provides a toolset containing templates for (1) the writing of case studies, (2) the effective classification and storage in an online database (Web platform), (3) and ways to organize workshops and events where first-hand experience is being presented (teaching). A common classification scheme was established in order to structure relevant knowledge and make it publicly available for all interested researchers and practitioners. The classification scheme is targeted at the e-business domain. It aims at a standardization of terminology and language used when talking about e-business.

The core eXperience case (research case) is the nucleus and includes an in-depth description of an existing business software solution and respective practices in an organization. It encompasses

- a description of the organizations and actors involved as well as the national regulations;
- the business scenario, partners, and company strategy;
The actual outcome of the project (IT solution);
the advantages achieved and the shortcomings observed (learnings).

The eXperience case study database is the largest case study platform in the German speaking area. As of April 2007, there are 301 case studies in German, 63 in English, and 13 in French available online (www.experience-online.eu). In April 2003, 22 leading e-business institutions (academic and industry) formed an interest group for the initiative EUREXIS (European Experience in E-Business and E-Government, www.eurexis.net). The members of the network have since then regularly summoned meetings at IS conferences and are waiting for an opportunity to further pursue the goals of forming a publicly funded Network of Excellence for the writing and dissemination of case studies. Most EUREXIS members are ready to adopt the eXperience methodology – provided that they find funding for their local activity. The EUREXIS project takes into account the need for a public database for case studies about best practices in e-business in Europe. Although many case studies are written (mainly in universities) there are only few organizations in Europe which regularly and systematically collect case studies and make them publicly available. Most case studies never reach a broad target audience.

Within the EUREXIS initiative, a first spin-off project (called REGEBLab) between two Universities in Switzerland and Bulgaria was successfully initiated in 2006 and is currently funded by the Swiss National Foundation (SNF). The goal of the project is to use the eXperience methodology to exchange knowledge, carry out research activities, and disseminate state of the art know-how to SMEs and other relevant parties in the areas of e-business and e-government. The project will contribute to the e-business and e-government research to be grounded in practice, as well as for transferring Swiss knowledge and experience to Bulgaria.

There are many different methods for writing case studies (Gillham 2000). Known approaches mostly stem from the domain of teaching (e.g. Harvard teaching cases). We need to keep in mind that research cases and teaching cases differ in many ways. A research case is a compilation from experiences and conditions in real organizations with a real-world context which can be used for cross-case analysis (comparison between similar organization and contexts). Teaching cases, on the other hand, are written for a learning environment and can be purely fictional.

There are many different suitable ways of writing research cases and authors usually choose their own set of questions which they want to address. The eXperience methodology has proved itself useful over years in the business software environment with many different authors. With the help of the common grid and the use of a uniform terminology, the resulting case studies are easier to compare and cross-analyze. As a result, the eXperience database will provide an increasingly vast basis for case study research which can be tapped into free of charge by the community of IS researchers.

A more detailed description of the contents of the case study template can be found in the eXperience handbook for case study writers which can be downloaded at http://www.experience-online.ch.

Acknowledgements

Many people have contributed to the eXperience methodology over the years. The core methodology with the uniform template and the four basic views was developed by Petra Schubert and Ralf Wölfle in the year 2000. The first application of the eXperience methodology took place in order to present case studies at a conference complementing Switzerland’s largest IT trade show (Orbit). Over the years, the creators of the methodology collected feedback from the participating parties, most importantly from the more than 40 authors together with their interview partners. The e-business team in Basel regularly reviews the template and adapts it to the yearly changing focus topic. The Swiss State Secretariat for Economic Affairs (seco) financially supported the design, programming, and editorial support of the eXperience database which was launched in 2002. In the year 2006, the methodology was enriched by a more detailed terminology for the technical view by Michael Quade. This improvement was financially supported by the Hasler Stiftung. The authors of this paper would like to show their appreciation for all suggestions and constructive feedback supplied by the involved parties over the years. We would like to give a special thank you to the sponsors of the eXperience Event who made the seven consecutive years of case study writing financially possible.
References


