

Open Source Software (OSS) within organization

Critical factors for consulting

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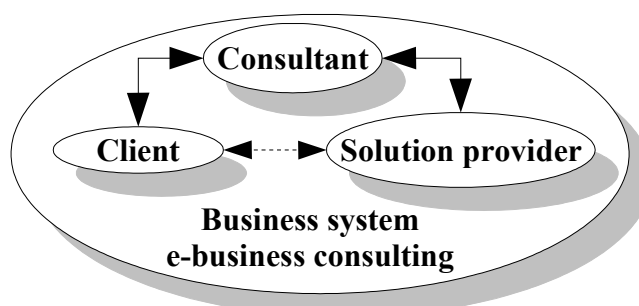
1 Introduction

The consultation of enterprises and organizations regarding the correct implementation of modern information technology is an important segment on the modern consulting market. The main focus of this work is to conduct the consultation in consideration of the topic "*Introduction of Open Source e-Business Technologies*".

Michael Porter identified a set of interrelated generic activities common to a wide range of firms and organizations. The resulting model is known as the value chain¹. Due to limited budget funds more and more enterprises are designing their value chain more cost-effective by using web based systems. To conduct business on the Internet is called e-business (electronic business). It refers to not only buying and selling but also servicing customers and collaborating with business partners over a web based system. Mostly all parts of the value chain can be supported by e-business technologies. To further reduce the costs this e-business technologies should be *Open Source*.

2 Consulting

The consultation contains the actors shown in drawing 1 and should be conducted with standardized methods to be objective. This model takes in



Drawing 1 Business system "e-buisness consulting"

consideration that the consultant do not have to be a solution provider (companies specialized with implementation). This is even better for the objectivity of the deduced solution. Using e-business to consult e-business would mean to conduct parts of the consulting process (standardized methods) over a web based system which will reduce the costs for the consultation itself.

¹Porter, M.: Wettbewerbsstrategien (competitive strategy) – Methoden zur Analyse von Branchen und Konkurrenten , 7. überarbeitete und erweiterte Auflage, Campus Verlag, Frankfurt/Main, 1992

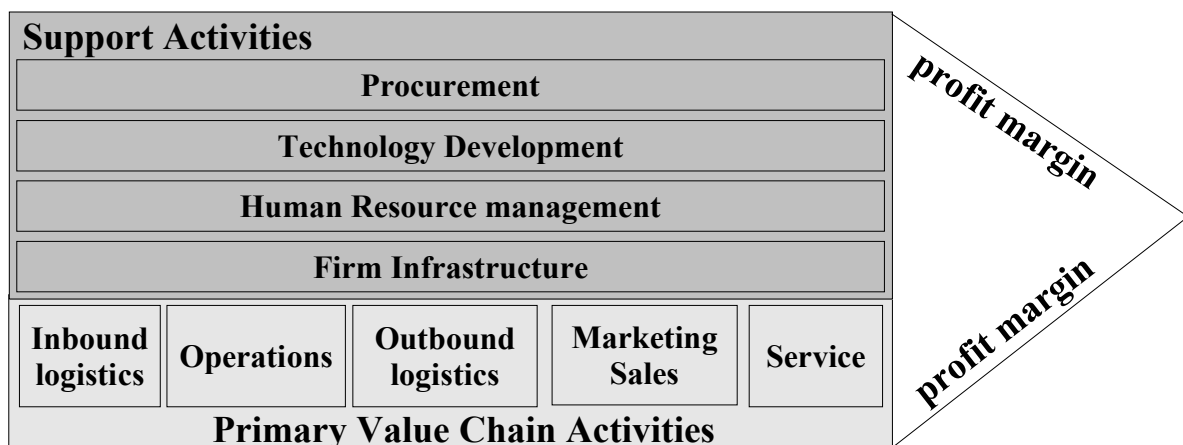
Different consulting companies use different procedure models for their consultation process. As well different authors propose different models. Strasser² divides the chronology of the consultation process into the following three phases which can be found in almost all procedure models:

t- time ▶		
<i>Initiation</i>	<i>Execution</i>	<i>Final stage</i>
The client becomes aware that he needs a consultation and contacts a consultant. The consultant analyzes which fields of the client should be remodeled and supported by web based systems.	The consultant collects information about restrictions. He then optimizes the processes and is looking into different software solutions.	The client decides about the proposal and the consultation ends.

Table 1 Phases of the consulting process

2.1 Initiation

The relative position within its industry determines whether a company's profitability is above or below the industry average. The fundamental basis of above average profitability in the long run is sustainable competitive advantage³. There are two basic types of competitive advantage an organization can possess: low cost or differentiation. To analyze the specific activities through which organizations can create a competitive advantage it is useful to model the organization as a chain of value-creating activities¹. The following procedure model presumes that an analysis of the value chain can deduce general functionality for a software solution. This functionality has to be included in the e-Business technologies that a solution provider offers.



Drawing 2 Value Chain

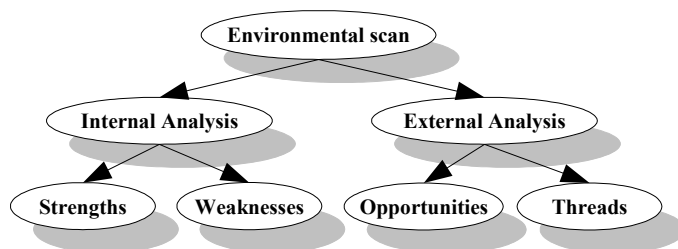
²Strasser, H.: Unternehmensberatung aus Sicht des Kunden, Schulthess, Zürich, 1993

³Porter, M.: Wettbewerbsvorteile (competitive advantage) – Spitzenleistungen erreichen und behaupten, 5. überarbeitete und erweiterte Auflage, Campus Verlag, Frankfurt/Main, 1999

Activity	<i>Primary activities</i>	<i>Support activities</i>
Goal	Create value that exceeds the cost of providing the product or service, thus generating a profit margin.	Facilitate the primary activities
Activities	<ul style="list-style-type: none"> • Inbound logistics include the receiving, warehousing, and inventory control of input materials. • Operations are the value-creating activities that transform the inputs into the final product. • Outbound logistics are the activities required to get the finished product to the customer, including warehousing, order fulfillment, etc. • Marketing & Sales are those activities associated with getting buyers to purchase the product, including channel selection, advertising, pricing, etc. • Service activities are those that maintain and enhance the product's value including customer support, repair services, etc. 	<ul style="list-style-type: none"> • Procurement - the function of purchasing the raw materials and other inputs used in the value-creating activities. • Technology Development - includes research and development, process automation, and other technology development used to support the value-chain activities. • Human Resource Management - the activities associated with recruiting, development, and compensation of employees. • Firm Infrastructure - includes activities such as finance, legal, quality management, etc.

Table 2 Value chain description

Michael Porter identified the value chain¹ which can be seen in drawing 2 as a standardized method. The elements of the value chain are explained in table 2. The consultant will conduct a scan of the internal and external environment of every element (primary and support) to know, which processes of the company should be remodeled and supported by e-business technology. Such an analysis of the strategic environment is referred to as a SWOT analysis. The SWOT analysis provides information that is necessary in matching the firm's resources and capabilities to change within the



Drawing 3 SWOT - Analysis

competitive environment in which it operates. The consultant has to identify the activities where the opportunities and the strengths exceed the weaknesses and the threads.

2.2 Execution

The activities where the benefits exceeds the costs should be supported by e-business technology. This activities have restrictions on the resources and the capabilities of the internal processes. This restrictions can be mapped to the functionality a software have to provide. Knowing this functionality the consultant has to look for alternatives that exists in the market. He will have to contact solution provider to analyze which software offers the necessary functionality. The final step of the execution phase is to evaluate the cost and the benefits of the software alternatives.

The main difference between open source and proprietary software for the consultation is that there are a lot of solution provider for proprietary software and only a few for OSS. This is changing today where for example the MySQL AB⁴, who holds the source code for the MySQL database, offers certification, training and a list of solution provider which can help by implementations. The same services offers the JBoss Group⁵ which announced a strategic alliance with MySQL⁴. JBoss is a J2EE based application server certified by Sun⁶. The last example is Orixo⁷, a business alliance of European companies specialized in building and supporting enterprise XML solutions around Open Source technologies. All these companies that have been mentioned are part of an active healthy open source community. This is a very important aspect for the quality and long run of a software alternative. To show this importance a short historical overview over open source will be given at the end. The consultant should have a list of solution provider (experienced in the implementation of open source software) which he can contact to get information about software functionality and the community. The consultant should have as well experience with open source communities to evaluate the health of the proposed software in communities aspects.

2.3 Final stage

The presentation of the deduced solution should include a cost effectiveness analysis for the software. In case of an open source software the proposal has also to include a SWOT analysis of the community behind the software. In combination of the evaluation of the cost and benefits of the alternatives the client can make his decision based on an objective proposal.

4<http://www.mysql.com/>

5<http://www.jboss.com/>

6<http://www.jboss.org/services/press/j2eecert.pdf>

7<http://www.orixo.com/>

Excursus - Open Source

Although it is widely discussed, many people remain confused by just what open source software (OSS) is. The key feature which differentiates an open source product from a commercial software product is that the source code is made freely available and can be modified and altered at will by individual users⁸. This has three important consequences. Firstly, there is no charge for the basic software, since anyone can access and compile the code. Secondly, bugs in the software can be identified by any of its users, and can be fixed instantly. Thirdly, users have total freedom in modifying the product to fit their individual needs better.

That there is no charge for the basic software does not mean that there are not any costs. The learning curve, *“a graph showing some measure of the cost of performing some action against the number of times it has been performed”*⁹, to adapt to an open source product or to get information of its functionality is normally signed by higher costs (time) in comparison to a proprietary product. This is due to the fact that there are less solution providers who could help by either an implementation or a consultation about the functionality of the software. A healthy community around the open source product is a very important aspect as well because the history of open source is closely connected to a working *“software, information and knowledge sharing community”*.

Excursus - Unix

The history of Open Source is closely tied to the history of UNIX and GNU / Linux. Open source has a long history that goes back to the creation of UNIX (1969) and further. Traditionally, hardware vendors like International Business Machines (IBM) delivered the source code for the operating systems of their early computers with the shipment of the machine. Furthermore, computer manufacturers actively encouraged users to share improvements to the software out of a belief that it would help save support costs. This belief changed only gradually with the advent of UNIX¹⁰. In October 1973 UNIX became popular in the field of computer science, but it was created 1969 in AT&T Bell Laboratories like Ritchie¹¹ stated. AT&T had been convicted of antitrust violations in 1956, prohibiting it to start any other business than telephone or telegraph services.

8 <http://web.zdnet.com.au/special/government/story/0,2000056052,20278285,00.htm>

9 <http://www.hyperdictionary.com/computing/learning+curve>

10 <http://citeseer.nj.nec.com/cache/papers/cs/27173/http.zSzzSzopensource.mit.eduzSzpaperszSzrotfuss.pdf/a-framework-for-open.pdf> page 11

11 <http://cm.bell-labs.com/cm/cs/who/dmr/hist.html>

After people outside the company had started to get interested in the operating system AT&T had to avoid any conflict with the decree. Their policy was to license the software (allowed by the decree) but not to pursue software as a business. UNIX was provided "*[a]s is, no support, payment in advance*" Without support and bug fixes the growing community of UNIX users was forced to help themselves. They started to share ideas, information, programs, bug fixes, and hardware fixes. User groups were created wherever UNIX was introduced.

Excursus - GNU / Linux

The following quotations are taken from DiBona¹². Starting his job at the MIT Artificial Intelligence Lab in 1971, Richard Stallman joined a "*software sharing community that had existed for many years*". Anytime you stumbled over an interesting program you asked the creator for the source code and read it, changed it or used parts of it to write a new program. Unfortunately, the model was discontinued in the early 1980s, all the created programs were unusable as they were written in assembler language and computers of that era had their own proprietary operating systems. "*[Y]ou had to sign a nondisclosure agreement even to get an executable copy*". He did not want to "*join the proprietary software world, signing nondisclosure agreements and promising not to help [his] fellow [programmer]*". So he was looking for a possibility to be a programmer and work on the establishment of a new cooperative community. He decided that the crucial component was an operating system as you cannot use a computer without it. He chose to make his new system compatible with Unix. Therefore he called his new project "*GNU*" which stands for the recursive acronym "*GNU is Not Unix*" and coined the term "*free software*" in opposition to proprietary software. The "*GNU General Public License*" (GPL) is based on a method called "*copyleft*" and is used to keep software free. In order to speed up the project he decided to adapt existing components of free software wherever it was possible. People started using single finished components on the various compatible Unix systems. "*By 1990, the GNU system was almost complete; the only major missing component was the kernel*".

Fortunately, Linus Torvalds started to develop his own Unix-compatible kernel "*Linux*" in 1991. An important aspect was that Torvalds provided Linux under copyleft and invited anyone to help him develop and improve the kernel. The developer community grew quickly with the help of this extraordinary development model and the used infrastructure, the Internet.

¹²DiBona, C. et al. (editors): *Opensources - Voices from the Open Source Revolution*, 1999, O'Reilly & Associates Inc., Sebastopol