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Enterprise systems ecosystem: A case study based comparison of software companies

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ABSTRACT (REQUIRED)

Enterprise System (ES) providers may create an ecosystem around their solution permitting other software companies to develop and distribute software that enhances, extends or modifies enterprise systems. This contribution takes a closer look at the business model of companies that are part of an ecosystem through various comparative case studies. Companies have been evaluated according to their business model and success in two steps: a standardized survey and in-depth interviews. Based on the results a model was derived that visualizes the fact that companies success is related to their consulting intensity, volume of sold licenses and degree of standardization of the software they provide. From this fact a classification model has been created and introduced, which can also be applied to evaluating business models and success of companies that are not members of an ES ecosystem.

Keywords (Required)

Enterprise systems, ecosystem, business models

INTRODUCTION

Following (Jansen, Finkelstein, Brinkkemper, 2009), ES providers have become networked, meaning that ES providers sometimes depend on service and software suppliers, value-added-resellers, pro-active customers who build and share customizations, and many others. Furthermore, ES providers increasingly rely on their partner ecosystems as numerous microvertical requirements and development resource constraints outpace internal efforts to rapidly bring solutions to a wide variety of stakeholders (Wang, 2007). This contribution presents an approach where the business model of ecosystem members is explored and conclusions drawn. In order to evaluate the business model, interviews were conducted in 12 different companies.

This contribution evaluates the applicability of the (Brockmann, Gronau, 2009) framework on the members of an ES System provider's ecosystem. Additionally, the dimensions that can be used to determine the financial success of a company belonging to the ecosystem will be identified.

ENTERPRISE SYSTEMS

The following section contains various definitions on ERP systems, leading towards a definition to be used throughout the remaining part of it.

The abbreviation of Enterprise Ressource Planning, ERP, is defined by (Sumner, 2005). According to (Nah, Lau, Kuang, 2001), resources related to a company (finance, materials, human resources, etc.) are managed efficiently and effectively through an ERP system by providing a total integrated solution for the information-processing needs of an organization.

According to (Peslak, 2006), an ERP system consists of a series of functional modules that include all information and data on vendors, customers, employees and products integrated through standard business processes. Common modules include

accounting, marketing, logistics, sales, purchases, manufacturing, human resources and inventory. A similar view is taken by (Aladwani, 2001), defining an ERP system as an integrated set of programs, providing support for core organizational activities, finance and accounting, manufacturing, logistics, sales, marketing and human resources. The ERP system thereby helps different parts of an organization to share knowledge and data, to reduce costs and to improve management of business processes.

An ERP system is defined by (Botta-Genoulaz, Millet, 2005) as a software package that integrates all departments and functions of a company onto a single computer system that can serve all needs of different departments. The approach taken by (Huang, Wang, Yu, Chiu, 2004; Mohamed, S., 2009) defines ERP systems as configurable information systems, integrating information-based processes and information within or across organizations. An ERP system defined by (Payne, 2002) is a business support software that enables a company to combine computer systems from different areas of a business's – finance, sales, marketing, production, human resources – to run on a single database.

For the purposes of this contribution, an ERP system is a software package that contains applications for different business areas (e.g. finance, marketing, etc.), and stores and accesses information from a single database, used to effectively and efficiently plan and manage the resources of companies. ERP systems are developed by ERP system providers (Oliver, 1999).

SOFTWARE ECOSYSTEMS

Based on (Boucharas, Jansen, Brinkkemper, 2009), a software ecosystem (SECO) can be defined as a set of actors, functioning as a group and interacting with a shared market for services and software, with the relationships among them.

Referring to (Bosch, 2009) ES providers might create and nurture ecosystems for one of the following reasons: To increase the core value a current user receives; to increase attractiveness for new users; establish switching costs, which, (Jorgenson, Wessner, 2006) stated will occur when users switch to a different system; enable open innovation; decrease TCO by sharing maintenance costs with other developers.

BUSINESS MODELS

A framework was presented by (Brockmann, Gronau, 2009) to conceptualize business models of ES providers. The framework was extended in this contribution to include the Resource Based View (RBV), which is concerned with internal resources, capabilities (Penrose, 1959; Wernerfelt, 2005) and their connection to strategic decision making (Peteraf, 2005). The RBV can be used to show the underlying theory of (Johnson, 2010), whose business model includes a block of key processes and resources.

The business model concept that has been validated is shown in Figure 1. The model of (Brockmann et al., 2009) has been extended by two elements: Key processes and Resources. Key processes refer to processes that a company believes are causing their financial success and may differentiate them from their competitors. Resources are used by a company to achieve organizational success and can be either physical, e.g. buildings, equipment, physical technology used, access to raw material and geographical location or intangible assets, such as patents; and human resources (Becker, 1964; Drucker, 2007), consisting of individuals and their knowledge.

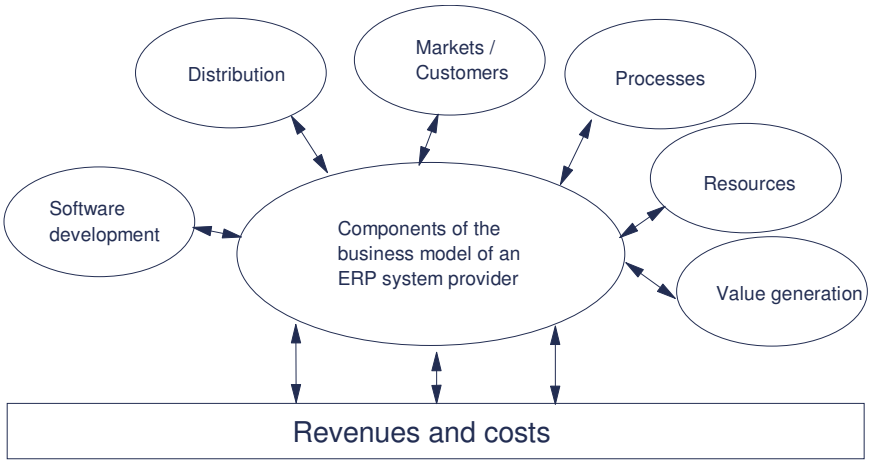

Figure 1: The business model framework

METHODOLOGY

This contribution is based on an embedded case study which allows multiple units of analysis to be taken into account for theory building (Yin, 2003). Each unit of analysis has been studied by conducting a semi-structured interview with the general manager of the participating company. In accordance with (Arksey, Knight, 1999) the semi-structured interview allowed the authors to conduct the interview based on a certain structure and ask additional questions where deemed pertinent. After all surveys were conducted, additional interviews with the unit of analysis followed. The authors of this contribution would classify the case study as an intrinsic case study in accordance with (Stake, 1995), since an intrinsic interest on business models was present during the survey.

Since our goal is to focus on the applicability and value of ecosystems, a core requirement to be fulfilled is to interview providers which are members of the introduced ecosystem.

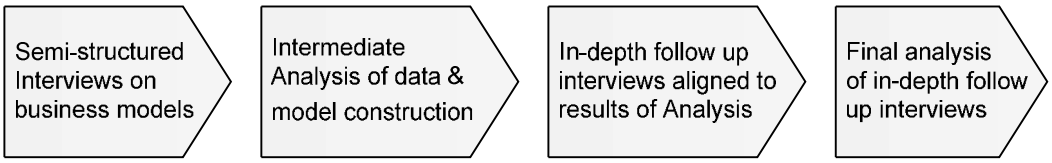

Figure 2: Four methodological steps to elevate the data

FINDINGS AND ANALYSIS OF ELEVATED DATA

The findings presented in the section were obtained using the aforementioned methodology. Two rounds of interviews were prepared and conducted in companies belonging to an ES ecosystem. The results of both interview rounds were condensed with the key discoveries presented in the following section. These conclusions are organized into categories which have previously been proposed by (Brockmann et al., 2009).

- Software development: A software company usually develops the software itself; consulting companies support the software development of their customers with individual knowledge. For complex software products a hybrid-strategy (consulting and software development) is often used, especially in the case of niche products or software solutions that are very branch specific and/or individually configurable
- Distribution: Software is easier to distribute than to sell to consulting services. To sell software intermediaries may be used, since the software usually already exists at the time of the sale and additional customers are reached through the distributor. Consulting services have a more difficult time with distribution because generally a company uses its own staff to bring its consulting service to market.

- Resources: The amount of software developers can be increased in order to either shorten product development or increase functionality without diverging from the schedule. Increasing the amount of consultants does not automatically result in the same marginal utility as adding a developer to a software development project.
- Value creation: Besides the value, which a software solution creates for its customer due to implementing functions, companies are increasingly offering assistance free of charge when a customer wants to select a software product. The assistance within the selection process aims to facilitate the potential customer information that leads to purchases of the vendor's products. Further on, technological trainings are used to lure software engineers and IT executives of potential customers into courses that show how to solve highly discussed IT problems. Companies, which mainly focus on consulting services, increasingly develop software components, since their customers (software developers) are not experienced in implementing the proposed solution by applying the proposed technology. When consulting, customers demand permanent performance of employees whose level of performance might vary. Thus the company has to assure that a constant level of performance through the provision of adequate resources is delivered to its customers.
- Markets/customer: The low-cost segment grows, since small businesses increasingly use enterprise systems along with connected e-commerce modules that handle their transactions on sales-side.
- Revenue: Software-as-a-Service (SaaS) revenue offers more flexibility than license revenue. Companies are able to obtain increased revenue per customer since they are able to create special packages containing only functional components that are relevant for the customer, and subsequently avoiding overshot and undershot offerings. The components originate either from the company itself, an ES system provider or from one or more members of the ecosystem.
- Costs: Not only are the salaries of Software developers lower than those of consultants, but implemented solutions can be sold for years after having finished the development while consulting services are not able to be stockpiled. Moreover, the demand for consulting services is subject to a huge variation which results in difficulties planning the amount of resources needed.
- Shareholder value: The business' value is usually determined when a company is intended to be sold. Consulting companies are generally valued at 2-3 times the amount of their annual turnover.
- Dependence: Companies are intrinsically dependent on the knowledge of their employees. If employees resign, companies may suffer severe disruptions to their services. In conclusion, companies' size is related to the standardization degree of the software they provide, and to their consulting intensity. The size of a company is bigger once selling Software-as-a-Service. The more consulting services that are offered, the smaller the company is. Through this comparison it was noted that large companies tend to distribute standard software. Smaller companies focus on individual software or niche products. Companies providing primarily consulting services are smaller in terms of employees and sales volume.

The major problem of only providing IT consulting services for companies, which develop business software, is that this kind of service requires a substantial number of fully qualified and experienced personnel and contacts. The demand for consulting services is also unstable. While a limit of providing consulting services is quickly reached due to the amount of available consultants, software sales are easily scalable since the software is downloaded or distributed through media (e.g. a DVD or a CD). Additionally in the case of a pure consulting business the personnel costs may rise quickly to an elevated level: see IT Skills and Salary Report of the year 2009 in (GlobalKnowledge, 2009).

MODEL CONSTRUCTION

Based on the previous findings two dimensions for classifying companies belonging to the ecosystem of an ES provider were identified. The first dimension is the degree of standardization. A high degree of standardization means that the solution provided by the ES ecosystem member only needs to be customized in orders to be deployed for individual purposes. A low degree of standardization means that the ecosystem member needs to develop an individual solution for each business-specific project.

The second dimension is the proportion of revenue between consulting and licenses. The companies belonging to the ecosystem of an ES provider usually derive their revenue from consulting or from license sales. It should be noted, that the revenue created by means of license sales includes recurring revenue from Software-as-a-Service.

The model depicted in Figure 3 illustrates the classifications of the companies surveyed.

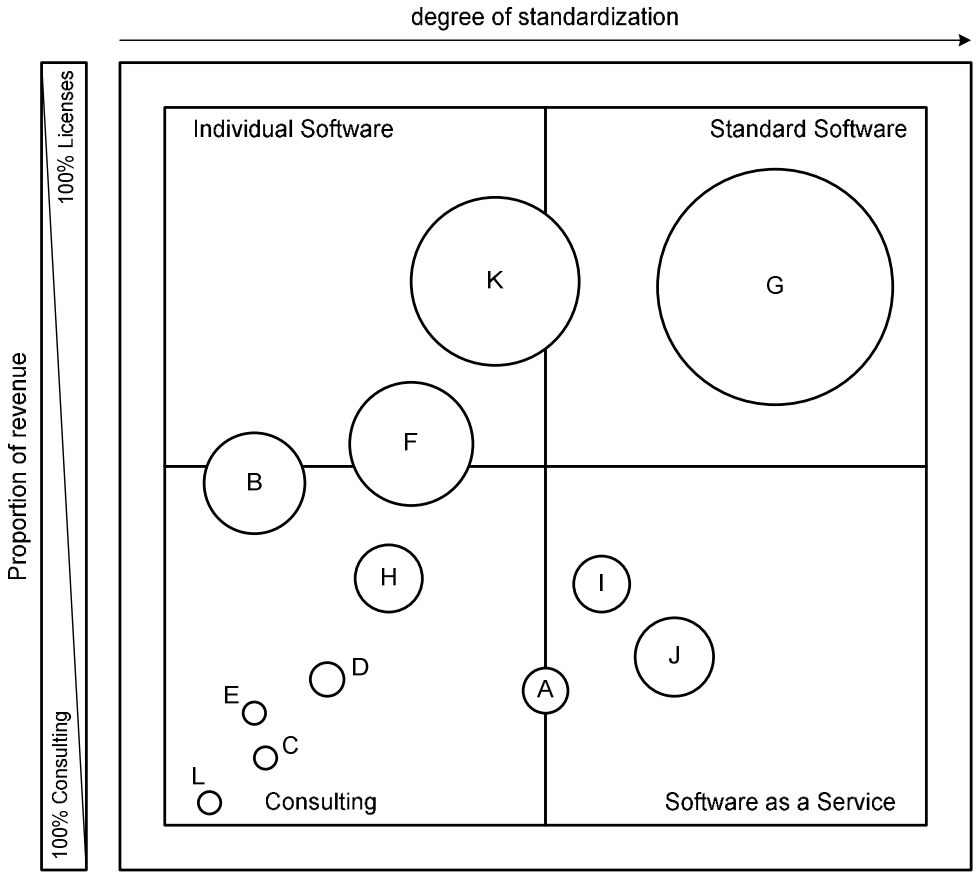

Figure 3: Classification framework for evaluated business models

CONCLUSION AND FURTHER WORK

The business model of companies engineering software and/or providing IT services were the subject of this contribution. Interestingly, the results so far show a relationship between company size, consulting intensity, and the degree of software standardization.

It should be noted that the derived classification framework has been applied to the context of companies belonging to an ES provider's ecosystem. It was been demonstrated that financially successful companies were dedicated to revenue from licenses as well as standard software development which only has to be maintained in order to be able to provide individual solutions. These findings are based on the companies surveyed. In order to be able to generalize the findings a quantitative evaluation providing valid and reliable results should follow.

Further research to be undertaken may include an evaluation of the model introduced, out of the range of an ES ecosystem. Such an evaluation would address companies developing software for their own internal purposes that is not sold or made available as a service like, for example, in the case of licenses or SaaS.

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F	G	H	I	J	K	L
Consulting and Modeling of ES software architecture and business processes by tools (UML based), rapid & easy customizing, model-based software development, project management, design, and analysis of software	Development and distribution of an object-oriented modeling tool, entity relationship modeling, business process modeling, consulting and academia in the field of Object-Oriented Modeling	Deployment, configuration and customizing of standard sell-side shop systems and POS extensions for ES.	Development of sell-side user-statistic and analysis systems for online-shops	Development of a secure online backup service, clients will frequently encrypt & upload their critical data through secure channels to the company's servers	Development of RMI-based Middleware as communication infrastructure for business applications	Consulting for Java Enterprise Software development and for web development and object oriented design
Worldwide	Germany	Germany, eastern Europe	German speaking area	Worldwide	German speaking area	Germany
small, medium and large businesses	small, medium and large businesses	Small and mid-sized companies	Mid-size to large companies	Low-Cost, small, mid-size companies	Mid-size to large companies	Mid-size to large companies
Development tools and consulting services for object-oriented software development	A comprehensive Modeling Suite as a Standard solution, Consulting and Training for introducing this suite into enterprises	Installation, configuration and maintenance of standard shop systems.	Distribute licenses but also offer SaaS	Offer online backup solution for personal use and for business use	Distribute licenses, offer support and maintenance for individual business needs	Offer seminars, individual consulting
Money software license revenue / Consulting: 2009: 0:100 2010 planned: 30:70 In the medium term plan: 80:20	1 / 3 licenses, 1 / 3 maintenance, 1 / 3 Consulting	40% installation and 40% configuration; 20% maintenance	40% licenses, 40% SaaS, 20% consulting	70% End-User SaaS 30% Business User SaaS	60% licenses, 20% marketing, 20% maintenance & support	70% consulting, 30% seminars and on the job trainings
Expenditure 2009 - 2011:> 1 million Staff:> 60% Marketing & Sales:> 20%	Development costs (staff costs 20%), consulting costs (staff costs 70%), administrative costs (staff costs 10%)	Licenses (30%); Maintenance (20%); Installation and Deployment (50%)	70% staff, 30 infrastructure maintenance	60% staff, 40% IT-infrastructure	70% staff, 30% administrative costs (infrastructure, and other)	80% staff, 10 % marketing, 10% administrative costs

Company	A	B	C	D	E
Key Activities	Provides standard software for logistics (network solution). Content management and individually engineered e-commerce solutions.	Collection of market and user requirements that are usually partly covered by an ES and development of individual solutions as an extension of the existing ES.	Development of Web sites and sell-site market exchanges engineered for specific users. Maintenance of third party content management systems.	Provision of IT consulting services for sell-site applications; SEO for the e-commerce platforms of Web ES.	Deployment and set-up of open-source ES additions.
Market	German-speaking countries, Eastern Europe, UK and South America	German-and English-speaking region	Germany	Worldwide	Germany
Customer	Small, mid-size and large companies	Mid-size & large companies	Small companies, private individuals	Mid-size and large companies	Small businesses and individuals with a limited budget
Products	Web-hosting, Data Safety, Networking solutions, Internet services, individual and flexible software solutions,	Individual Solutions for a diversity of branches,	Individual B2C and B2B plug-in solutions	Search Engine Optimizing and Marketing services	Custom development for individual requirements set up and Install forums, blogs, and Shop systems
Income	Licenses about 20%, maintaining about 50%, Consulting 30%	Consulting (100%)	90% of Web development, 10% indirect revenue through the development of plug-ins	Maintenance, Consulting	80% of orders, subsequent orders / maintenance / customizing 20%
Expenses	Server & Maintenance costs about 40%, travel or travel expenses (especially customer service) about 20%, rent and related office space (approx. 10%), staff 30%	Staff costs (about 75%) and administration (Other) (ca 25%)	90% Development 10% Sales / Consulting	40% development, 60% of sales and consulting fees	90% development, 10% of sales and consulting service