Business Models in the Software Industry

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Abstract

Business models describe the strategic direction of a firm and have significant impact on the success of innovations. While the term business model is broadly used, a comprehensive definition in the context of the software industry has not yet been provided. In this paper, we conceptualize a software industry business model, supporting the description of software firms' business models in a standardized manner. Our model aggregates and unifies findings from a literature review in three disciplines, generic and software industry specific business model concepts as well as economic properties of the software industry. The resulting business model concept comprises 20 elements. A first empirical proof of concept among 10 software business models confirms the applicability of the presented concept. The business models are instantiated based on the proposed framework and the interviewees confirm the applicability, relevance, and importance of the proposed business model.

1. Introduction

The success of innovations in the digital economy highly depends on the respective business model [13]. Particularly in fast evolving sectors such as the software industry, business models are a key element for the accelerated diffusion of innovations. Thus, there is a need to establish business model development as part of the innovation management and to demonstrate how managers can take advantage of this concept.

While the term business model is broadly used in entrepreneurial practice, the definition, nature, and structure of business models is still an object of debate among researchers [3]. As terms such as strategy, business model, and revenue model are often used interchangeably, confusion in terminology is very common. A business model is not a strategy, but it comprises a number of strategy elements. According to the state of the art review by Morris et al. [19], a business model encourages the entrepreneur to (a) conceptualize the venture as an interrelated set of strategic choices; (b) seek complementary relationships among elements through unique combinations; (c) develop activity sets around a logical framework; and (d) ensure consistency between elements of strategy, architecture, economics, growth, and exit intentions. While such generic business model definitions describe the business logic of a firm in an abstract manner, they fall short of addressing industry characteristics and terminology.

The main goal of this paper is to provide a cohesive understanding of a business model concept with respect to the software industry. Conceptually, we develop an industry specific business model framework. It makes strategic choices explicit and allows to identify trade-offs among decision variables. As a first proof of concept we conduct expert interviews and apply the concept to 10 software business models. The main contribution of this article is hence a comprehensive concept of a software industry specific business model. The proposed business model concept is an attempt to support innovation in the light of the digital economy by supplying a solid and complete foundation for researchers and practitioners.

This paper is organized as follows. Section 2 provides a comprehensive state of the art overview. It covers a literature review of both, generic and software industry specific business model research. Based on identified shortcomings, we derive requirements for a software industry specific business model. In section 3, the conceptual development of the framework is presented. Its constituent elements are then discussed in section 4. As proof of concept, section 5 provides an empirical validation of the business model framework. Finally, section 6 concludes the paper.

2. Related work

The concept of business models can be considered as a rather young field of research. Most research was published in the past decade, a time period associated with the digital economy [3]. As the number of potential business models is limitless, researchers

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define business model components ([10], [20]) or develop taxonomies ([17], [26]). However, a lack of consensus can be identified with respect to both, the components of a business model and taxonomies.

Morris et al. [19] synthesize the business model literature and draw conclusions concerning the elements of business models, regardless of the venture type. The resulting framework comprises six central key decision areas. In essence, a business model must address the value proposition, the customer, internal processes and competencies, how the firm makes money, competitive strategy, growth and time objectives. For each of these key areas, various elements are proposed as guidelines to characterize a business model. In section 3, we build our software industry specific business model concept upon these generic business model elements.

In addition to the research literature on the nature of business models in general, researchers have also looked at business models in the context of different domains. The majority of research has been concerned with eBusiness and eCommerce. For instance, Rappa [26] introduces the utility business model emphasizing the future of computer services. He proposes a taxonomy of nine e-business models. Amit and Zott [1] explore the theoretical foundation of value creation by examining 59 e-business models. Beyond e-business models, dedicated research has addressed software industry specific business models. The first approach dates back to 2003, when Käkölä [14] examined key areas for software business research and proposed software business models as a fruitful research field. Since then, further contributions have been published.

These publications were identified in an extensive literature review according to the guideline by Brocke et al. [2]. The keywords "business model" and "software" resulted in 116 combined hits retrieved from EBSCOhost and Google Scholar. Then, we sorted out non relevant publications by reviewing their titles and abstracts. For the remaining literature, we conducted a backward and forward reference search. Finally, we identified eight core publications, which particularly address business model concepts in the light of the software industry. These publications were analyzed in detail. Again both main streams of research can be identified. While some approaches define a business model's constituent elements, others aggregate certain characteristics to classes and build taxonomies.

In the field of business model elements, Rajala et al. [24] explore the characteristics of business models based on five case studies representing different businesses in software industry. Their resulting framework comprises four elements, namely product strategy, distribution model, revenue logic, and services and implementation. Kontio et al. [15] define a business model as a description of (a) customers and segments; (b) product and service offering; (c) the distribution model and partners; and (d) the revenue model. In his dissertation thesis, Rajala [23] investigates determinants of business model performance in software firms. The foundation of his empirical analyses in the Finish software industry is a business model concept comprising five elements: offering, revenue model, resources, relationships, and management mind-set. Finally, Valtakoski and Rönkkö [30] differentiate between components of a business model and complementary concepts. In their conceptualization, four main elements (offering, activities, revenue logic, and value network) constitute a business model. Competitive strategy, resources, and market are considered as complementary concepts and hence not part of a business model. Reflecting these various conceptualizations of software industry business model elements, a lack of consensus can be identified. Moreover, two main shortcomings become apparent. Compared to the comprehensive concept by Morris et al. [19], covering six key decision areas and numerous elements, the proposed software industry business model concepts comprise only four to five elements. Furthermore, the concepts and the terminology do not reflect software industry characteristics.

In the field of software business model taxonomies, further approaches can be found. Kontio et al. [15] define different classes of business models. They employ a model of four business model types (solution consultants, product integrators, product tailors, and product licensors). The foundation is a matrix based on two dimensions: degree of productization and percentage of product licenses in comparison to service revenues. With a similar approach, Rajala and Westerlund [25] also identify four types of software business models. They employ different dimensions: the level of involvement in customer relationships and the level of homogeneity (i.e. standardization) of an offering. They call the resulting four types software tailoring, resource provisioning, applied formats, and standard offerings. The key findings in six case studies indicate that there is a significant difference in the emphasis on internally and externally obtained resources among different types of the underlying four business models. Valtakoski and Rönkkö [29, 30] propose two different taxonomies of business models using survey data from Finnish software firms. In their first work [29], they identify six business model types and in their subsequent work [30] they refine them to eight business model classes. They differentiate among software product firms, ASP and SaaS firms, development service firms, deployment project firms,

software consulting firms, hardware firms, content and ads firms, and non-software firms. Finally, Popp and Meyer [21] derive six software business models from the classification concept by Malone et al. [17]: Inventor, IP distributor, IP lessor, IP broker, physical lessor, and contractor. All in all, five different kinds of taxonomies are proposed. In contrast to the software industry business model conceptualizations, the business model classes reflect the characteristics of the industry. For instance, the concepts differentiate between software product vs. software service companies and between the degrees of standardization. The proposed dimensions and business model types provide hence valuable input for a comprehensive conceptualization of a software industry business model.

The presented publications of both research areas, conceptualizations and taxonomies of software industry models, have their respective merits. However, the concepts are still fuzzy and vague, and there is little consensus regarding a business model's compositional facets. None of them provides a comprehensive definition that is derived from generic business model concepts and industry specific economic properties. Therefore, we combine the present research streams and propose a software industry business model following a stringent approach outlined in section 3.

3. Conceptual development of a software industry business model

For the conceptual development of a software industry business model framework, three fundamental requirements need to be addressed. Firstly, the proposed concept must build upon research results in the area of generic business model concepts. Secondly, related work of software industry concepts has to be considered. Thirdly, it needs to be aligned with the economic properties of the software industry to enrich constituent elements and terms with an industry specific meaning. The development of the business model concept is hence based on a literature review in the area of generic and software industry business model approaches as well as in economic properties of the software industry. The synthesis of the literature streams allows a high specialization on the industry specifics, while not neglecting the state of the art of business model research.

For the conceptualization of our software industry business model, initially, we referred to the comprehensive state of the art analysis by Morris et al. [19]. Further, we analyzed the business model building blocks provided by Osterwalder [20]. The rationale behind is that Osterwalder's concept is broadly referenced in academics and praxis, but it was not part of the literature review by Morris et al. [19]. In addition to these generic concepts, we reviewed the software industry specific conceptualizations and taxonomies that we discussed in the related work section. Moreover, we derived elements from the software industry value chain concept by Pussep et al. [22] and from Vähäniitty's [28] definition of key strategic decision areas for software firms. Finally, we developed a software industry business model framework comprising 20 elements. To prove its comprehensiveness and to show conceptual relationships, we mapped our elements to the ones in the related concepts.

To align the business model conceptualization to the industry characteristics, the economic properties need to be considered. Hence, we collected 43 economic properties, which were retrieved from four main sources: Messerschmidt and Syzperski [18], Buxmann et al. [4], Engelhardt [6], and Stelzer [27]. The identified economic properties are summarized in Table 1 and allow the integration of a software industry specific perspective. The table contains mappings between each economic property and the affiliated business model elements. The software economic property "EP11 Ease of replication", for instance, refers to 14 business model elements. For example, the pricing model (BM6), the degree of standardization (BM12), and the operating model (BM17) are highly dependent from this economic property. In total, 361 conceptual dependencies between the software economic properties and the business model elements can be defined. The framework is hence both, comprehensive from a business model concept perspective and highly related to the characteristics of the software industry.

4. Business model framework

Building on the conceptual and theoretical roots, our business model framework for the software industry comprises 20 business model elements that are clustered into 5 groups. For each element between 2 and 11 options of choice are defined to describe a respective business model. Table 2 illustrates the business model framework. Its elements are defined as follows:

Group 1: Strategy

1. Investment Horizon: This element deals with the business model's strategic time horizon. It stems from the business model definition by Morris et al. [19]. We extend their predefined

categories by a social as well as by a cross financing model.

2. Unique Selling Proposition: Based on Morris et al. [19] and Amit and Zott [1], we add two options as key differentiation factors, namely one stop shopping and network leverage.
3. Product Portfolio: This element is derived from the approach by Gao and Iyer [8], building a software stack level for merger and acquisition analysis. Considering the software taxonomy by Forward and Lethbridge [7], we restructure the software stack and add two levels.
4. Value Chain Strategy: Pussep et al. [22] defined a software industry value chain concept to measure the degree of vertical integration. This element summarizes the predominant value chain strategy based on the categories provided by Geyskens et al. [9]

Group 2: Revenue

5. License Model: This element describes the legal regulations associated with the software license. It stems from a synthesis of two sources: Buxmann et al. [4] and Malone et al. [17]
6. Pricing Model: Lehmann and Buxmann [16] proposed a comprehensive set of pricing parameters for the software industry. One important aspect thereof deals with the pricing basis of software pricing; i.e. usage based versus non usage based pricing methods.
7. Sales Volumes: This element is proposed by Morris et al. [19] and deals with the number of sold products.
8. Operating Margins: This element is proposed by Morris et al. [19] and describes the operating margin per sold product.

Group 3: Upstream

9. Technical Platform: As technical platform we define the dominating programming language. The ten dominating languages are retrieved from the TIOBE Programming Language Ranking[1] (as of April 2011).
10. Principles: This element contains software industry specific principles that are commonly emphasized in press and by companies.
11. Localization: Profit and loss statements of public listed companies usually disclose their geographical revenue distribution. The categories are retrieved from the profit and loss statement of the software firm SAP AG[2].
12. Degree of Standardization: Custom specific versus standard software is a commonly used differentiation among software companies [25]. We enhance the two categories by an intermediate level called batch production.

Group 4: Downstream

13. Channel: Based on general sales channel types, we choose those ones applicable to software companies.
14. Target Industries: This element describes industries that a software company can address. As categories we use the nine top level industry categorizations defined by Standard Industrial Classification (SIC)[3].
15. Target Customer Size: This element differentiates between private individuals and organizations. The latter can be small, medium, or large firms. The categories stem from Buxmann et al. [4]
16. Target Customer Type: Software can be used by different types of users. The categories are derived from Cotterman and Kumar [5] and Govindarajulu [11].

Group 5: Usage

17. Operating Model: While the traditional operating model of software emphasizes on premise installations, on demand models are gradually increasing [4].
18. Support Model: This element describes the type of contracts offered by a software firm. In general, software companies offer one single, few different, or various customer specific support options.
19. Maintenance Model: For this element, we refer to the release frequency derived from Greer and Ruhe [12]. It deals with the number of available releases at a time.
20. Replacement Strategy: This element deals with the number of available product releases at a time.

5. Empirical validation

Most commonly, research publications proposing business model definitions are based on conceptual and empirical work [19]. Accordingly, we propose enriching the conceptual development with a subsequent empirical validation. We define two main validation goals: Firstly, evaluate if the defined elements are meaningful, complete, disjoint, and on a

[1] http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html
[2] http://www.sap.com/germany/index.epx
[3] http://www.osha.gov/pls/imis/sicsearch.html

similar logical granularity, and secondly, investigate if the predefined element options provide adequate choices for practitioners.

Between April and June 2011, we conducted expert interviews with managers from nine software companies in Germany. Our sample contained one large software firm, seven small and midsize businesses, and a one man company. The firms were selected due to their heterogeneous business models in order to prove the comprehensiveness of the proposed business model in various settings. To ensure anonymity, the names of the companies were changed in the analysis documents. All in all, we covered 10 different business models in the 9 interviews; i.e. in one interview we discussed two different business models. Each conducted semi-structured interview lasted between 30 and 90 minutes. Five of them were performed face-to-face and four via telephone.

The interview structure comprised three main parts. Firstly, the business model framework was applied to a respective business model of the interviewee's firm. For each business model element, the interviewer explained the choice options and asked the interviewee for a decision. Depending on the element, some choices are exclusive and others allow multiple selections. The choices were marked according to a color coding scheme, resulting in a heat map. Secondly, after describing the respective business model in the framework, interviewees were asked to judge if the proposed elements are meaningful, complete, disjoint, and on a similar logical granularity. Likewise, the completeness of the choice options was investigated. Finally, interviewees were asked to provide open answers on any aspect of the framework.

The results of the interviews confirm the business model's practical applicability. Each interview participant was able to define their business model based on the provided framework. In nine of ten interviews, the elements were described as meaningful. Six interviewees judged the elements to be complete. All interview participants confirmed that the elements are disjoint. Moreover, seven interviewees affirmed that the elements are on a similar logical granularity. Finally, in the open answer part, the interview participants provided feedback which elements and/or choices could be removed, changed, or added. A selection of the most important comments covered the following aspects. Two interviewees recommended deleting the technical platform (BM9) and the support model (BM19). Besides, one interviewee preferred to remove principals (BM10). With regard to additional elements, some general firm characteristics (e.g. size or age of the firm) were proposed. Moreover, marketing was judged by two interviewees as an additional useful element. Further, two interview participants recommended to include an element, which provides insight if a product requires a certain technical platform or infrastructure. With regard to the choice options, three participants proposed more details for the pricing (BM6) element such as to include revenues stemming from advertisement or from consulting days. For the channel element (BM13), tendering and partner recommendation were expected to be additional useful choices. Finally, with respect to the target customer type (BM16), a more distinct differentiation (e.g. IT specialist, business user, manager) was claimed.

All in all, the interviews confirm the business model framework. Notably, some decision makers particularly emphasized the usefulness and importance of the framework. None of them has a similar structured overview on their business model. Nevertheless, the interviewee's feedback can be used for incremental adaptations. For instance, the pricing model element (BM6) could be enhanced based on the pricing parameters by Lehmann and Buxmann [16]. In this way, the model can be gradually modified, refined, and validated.

Table 3 and 4 summarize the business models of the interviewees. While "x" stems from a perfect fit, "o" describes a partial fit of the choice option. The business model frameworks make choices explicit and the resulting schemes emphasize the heterogeneous business models covered in our study. In spite of the heterogeneity, some choice options (e.g. retail as channel) were not selected in the interview. This fact calls for further interviews. Moreover, with respect to the evolution of their business models, most interviewees confirmed that they started with partially formed models and incomplete strategies. Over time, the emergence and evolution of various facets of their business models has been perceived. Thus, the business models described in Table 3 and 4 represent a snap-shot of the status quo, but might evolve over time. Nonetheless, the results permit general comparisons across ventures and support identifying universal models. The latter can be unique combinations of decision variables that result in marketplace advantages.

6. Conclusion

This work develops a business model framework for the software industry. It allows researchers and practitioners to design, describe, categorize, critique, and analyze a business model. The conceptual development of the business model framework builds upon related research and incorporates the characteristics of the software industry. The empirical results demonstrate the practical applicability and that

heterogeneous business models can be described within a standardized framework.

The framework's limitations mainly refer to the industry focus. It can only be applied to software firms. Moreover, the empirical validation should be continued by analyzing business models of further software firms. Feedback from interviewees can then be used to refine the model, incrementally. Finally, while the framework provides a comprehensive overview of a firm's business model, it offers only limited choices per element. The challenge is to define an appropriate granularity, which is still meaningful enough, but does not lack comparability due to firm specificity. Thus, for a transformation from strategy to operations, the business model decisions need to be further cascaded into more detailed decisions and business rules.

Based on this foundation, for the software industry, new avenues for empirical research emerge, ranging from investigations of relationships among elements, the identification of model archetypes, and the development of taxonomies. Moreover, performance analysis can be conducted to reveal lucrative business models. Further, it is possible to envision a business model life cycle involving periods of specification, refinement, adaptation, revision, and reformulation [19]. Finally, the translation of model elements into operational decisions is a promising area for research.

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Table 1: Mapping of software industry economic properties to business model elements

#	Software Industry Economic Principal	Related Business Model Elements
EP1	System dependency	BM3, 9, 10, 18, 19, 20
EP2	Intangibility	BM11, 14, 15, 16
EP3	Perishableness	BM4, 6, 17, 18
EP4	Integration of external factor	BM3, 11, 12, 13, 14, 15, 16, 18, 19
EP5	Perceived risk of buyers	BM7, 10, 11, 12, 13, 14, 15, 16, 19
EP6	Individuality	BM6, 11, 12, 14, 15, 16, 18, 19
EP7	Increasing computing power	BM3, 4, 6, 7, 9, 10, 11, 14, 15, 16, 17
EP8	Secundary role of performance	BM3, 4, 9, 10, 17, 19, 20
EP9	Cheap storage of increasing data	BM3, 4, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20
EP10	Implementation as software increasingly beneficial	BM3, 17
EP11	Ease of replication	BM2, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 19
EP12	Portability by information systems	BM13, 17, 18, 19
EP13	Development with information systems	BM9, 10, 19
EP14	Ease of modification	BM2, 3, 5, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19
EP15	Low importance of rationalisazion in production	BM4, 17, 19
EP16	High complexity	BM3, 4, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20
EP17	High need for good product- and systemarchitecture	BM9, 10, 17, 18, 19, 20
EP18	Protection of intellectual property	BM4, 5, 19
EP19	High fix costs	BM1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20
EP20	High requirements for technology und innovation mgmt	BM3, 4, 5, 9, 10, 20
EP21	High risk in software development	BM1, 3, 5, 9, 10, 12, 19, 20
EP22	Creativity in production of goods and services	BM9, 10, 12, 18
EP23	Custom-oriented design of goods and services	BM3, 11, 12, 13, 14, 15, 16, 19
EP24	Customer involvement during product development	BM3, 11, 12, 13, 14, 15, 16, 19
EP25	Iterative development	BM3, 10, 11, 12, 13, 14, 15, 16, 19
EP26	Support of users during information processing	BM3, 17, 18
EP27	Tradeoff between availability and capactiy utilization	BM6, 8, 9, 10, 17
EP28	High economies of scope	BM3, 5, 9, 10, 12, 19
EP29	Opportunities for differentiation	BM2, 3, 4, 6, 7, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20
EP30	Access to global markets	BM3, 7, 11, 12, 13, 14, 15, 16
EP31	High importance of intermediaries	BM2, 4, 6, 9, 11, 13, 14, 15, 16
EP32	Software as a network effect good	BM2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16
EP33	High importance of broad user basis	BM3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16
EP34	Software as an experience good	BM2, 10, 11, 12, 14, 15, 16, 18, 19, 20
EP35	Utility-dependent value	BM2, 3, 4, 6, 7, 11, 12, 14, 15, 16
EP36	New pricing models	BM5, 6, 7, 8, 11, 13, 14, 15, 16, 17, 18, 19, 20
EP37	Run software in combination with information systems	BM3, 9, 10, 17, 18, 19, 20
EP38	Quality asssurance of the whole system	BM3, 4, 9, 10, 18, 19
EP39	Non-rivalty of software	BM6, 7, 11, 12, 13, 14, 15, 16
EP40	Special requirements for security and authenticity	BM2, 4, 9, 10, 11, 14, 17, 18, 19
EP41	High change barriers for customers	BM1, 2, 3, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20
EP42	Standardisazion of software	BM2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14
EP43	High importance of standardization management	BM3, 5, 6, 9, 10, 12

Table 2: Software industry business model framework with its elements and choice options

Strategy											
Investment Horizon	1	Subsidence Model	Income Model	Growth Model	Speculative Model	Social Model					Cross Finance
Unique Selling Proposition	n	Quality	Features	Innovation Leadership	Efficiency	Intimate Cust. Relationship	Network Leverage				One Stop Shopping
Product Portfolio	n	Hardware Control	System Software	Middleware / Database	Application Software	Mobile & Web Applications					Softw. oriented Services
Value Chain Strategy	n	Make		Buy		Ally					
Revenue											
License Model	n	Sell Rights	Sell Right of License Usage	Freeware	Open Source (w/o inheritance)	Viral Open Source					
Pricing Model	n	Usage Based			Usage Independent						
Sales Volumes	1	Low		Medium		High					
Operating Margins	1	Low		Medium		High					
Upstream											
Technical Platform	n	Java	C	C++	C#	PhP	Python	(Visual) Basic	Objective-C	Perl	JavaScript	Others
Principles	n	SOA		Cloud Computing	Lean & Scrum	Multi-Tenancy	Mobile	Security	Web Services	Web 2.0	Real-time	
Localization	n	Local		AMERICAS		EMEA				APJ		
Degree of Standardisazion	1	Individual Production		Batch Production		Bulk Production					
Downstream											
Channel	n	Sales Agents		Retail		Online		Telesales		Events	
Target Industries	n	Agri., Forestry, And Fishing	Mining	Construction	Manu-facturing	Trans/Comm/ Elect/Gas/Sanitary	Trade	Finance/ Insurance/Real Estate	Services	Public Administration	
Target Customer Size	n	Private Individuals		Smal Organizations		Medium Organisations				Large Organisations	
Target Customer Type	1	User				Developer					
Usage											
Operating Model	n	On Premise				On Demand					
Support Model	1	Standard Support		Few Support Options		Customer Specific Support					
Maintenance Model (release frequency)	1	Weekly	Monthly	Quarterly	Biyearly	Yearly					
Replacement Strategy (avail. releases at a time)	1	One Release		Few Releases		Many Releases					

Table 3: Empirical results of business model instantiation – part I

Group	Element	Category	BM A	BM B	BM C	BM D	BM E	BM F	BM G	BM H	BM I	BM J	Sum
Strategy													
	Investment Horizon												
		Subsidence Model									x		1
		Income Model		x	x							x	3
		Growth Model	x		x	x	x		x	x			6
		Speculative Model						x					1
		Social Model											0
		Cross Finance									x		1
	Unique Selling Proposition												
		Quality		x	x		x				x		4
		Features	x	x	x	x	x	x			x	x	8
		Innovation Leadership	x		x	x		x		x	x		6
		Efficiency			o				x				2
		Intimate Cust. Relationship			x					x		x	3
		Network Leverage	x						x				2
		One Stop Shopping								x		x	2
	Product Portfolio												
		Hardware Control											0
		System Software											0
		Middleware / Database			x	o							2
		Application Software	x		x	x	x	x	x			x	7
		Mobile & Web Applications	x	x				x	x	x	x		6
		Softw. oriented Services	x		o	x	x	x	x	x		x	8
	Value Chain Strategy												
		Make	x	x	x	x		x	x	x	x	x	9
		Buy								o			1
		Ally			o	x	x		x	o			5
Revenue													
	License Model												
		Sell Rights						x				x	2
		Sell Right of License Usage	x		x	x		x	x	x	x		7
		Freeware									x		1
		Open Source (w/o inheritance)		x			x						2
		Viral Open Source											0
	Pricing Model												
		Usage Based	x	x			x	x		o	x		6
		Usage Independent		x	x	x		x	x	x	x	x	8
	Sales Volumes												
		Low			x	x						x	3
		Medium						x	x		x		3
		High	x	x			x			x			4
	Operating Margins												
		Low		x			x				x		3
		Medium	x					x	x	x		x	5
		High			x	x							2
Upstream													
	Technical Platform												
		Java				x	x	x		x			4
		C	x									x	2
		C++			o						x	x	3
		C#	x		x				x	x			4
		PhP		x					x				2
		Python											0
		(Visual) Basic											0
		Objective-C	x							x	x		3
		Perl											0
		JavaScript			x			x					2
		Others	x		o					x			3

Table 4: Empirical results of business model instantiation – part II

	Principles												
		SOA	x			x	x						3
		Cloud Computing	x			x	x		x				4
		Lean & Scrum	x					x		x			3
		Multi-Tenancy	x										1
		Mobile	x	x		x				x	x		5
		Security	x		o	x							3
		Web Services	x			x		x	x				4
		Web 2.0		x	x	x		x	x		x		6
		Real-time	x		x	x							3
	Localization												
		Local		x	x			x				x	4
		AMERICAS	x			x	x		x	x	x		6
		EMEA	x				x		x	x	x		5
		APJ	x						x		x		3
	Degree of Standardisazion												
		Individual Production			x			x				x	3
		Batch Production			o	x			x	x			4
		Bulk Production	x	x		x	x				x		5
Downstream													
	Channel												
		Sales Agents	x	x	x	x			x	x		x	7
		Retail											0
		Online		x		x	x	x		o	x		6
		Telesales	x		o		x	x	x				5
		Events		x	x			x	x	x		x	6
	Target Industries												
		Agri., Forestry, And Fishing					x		x				2
		Mining					x		x	o			3
		Construction			x		x		x	o			4
		Manufacturing			o	x	x	x	x	o		x	7
		Trans/Comm/Elect/Gas/Sanitary					x		x	x			3
		Trade			o		x	x	x				4
		Finance/ Insurance/Real Estate					x		x				2
		Services	x		o	x	x	x	x				6
		Public Administration			o		x		x				3
	Target Customer Size												
		Private Individuals		x							x		2
		Smal Organizations	x				x	x					3
		Medium Organisations	x		o	x	x	x	x	x			7
		Large Organisations			x	x		x	x	x		x	6
	Target Customer Type												
		User	x	x	x	x		x	x	x	x	x	9
		Developer					x		x				2
Usage													
	Operating Model												
		On Premise			x	x	x		x	x	x	x	7
		On Demand	x	x				x	x	o			5
	Support Model												
		Standard Support		x		x		x					3
		Few Support Options	x				x		x	x			4
		Customer Specific Support			x							x	2
	Maintenance Model												
		Weekly						o					1
		Monthly						x	x				2
		Quarterly				x				x			2
		Biyearly	x		x		x			x			4
		Yearly		x									1
	Replacement Strategy												
		One Release	x	x								x	3
		Few Releases			x	x	x	x		x	x		6
		Many Releases							x				1