A Framework for Business/IT Alignment in Networked Value Constellations

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Abstract. e-Services are just as commercial services; however e-services can be fully ordered and provisioned via the Internet. Such e-services are often offered by a constellation of enterprises rather than just one. A question is then how to properly align these enterprises, such that they can provision e-services. Additionally, because e-services rely so heavily on IT, aligning business (essentially the service) with IT is also of importance. In this paper, we present a framework that can be used to structure various alignment questions that pop-up while designing value constellations for e-services. We illustrate the framework by a small case study.

1 Introduction

In the past few years, e-commerce – trading and selling products via the Internet – has mainly been about *physical goods*, being things that can be dropped onto the floor. Nevertheless in most countries, *services* form a significant part of total economic activity. Services are deeds and performances of a mostly intangible nature [3]. A specific kind of services is *e-services*. They rely on a substantial amount of IT for production and provisioning. e-Services are seldom offered fully by *one* enterprise. Rather, they are often offered by *networked value constellations* [5], formed by organizations that jointly work on the satisfaction of a complex customer need. For instance, a managed domestic home network including Internet access requires among others an ISP; a company that installs the hardware and repairs it if it is broken and a company that manages and monitors the correct functioning of the domestic network.

Designing a networked value constellation offering e-services, e.g. for a managed domestic network or a streaming music service is not an easy task. One of the reasons for this is that many different *perspectives* (e.g. IT and business processes) of the participating enterprises have to be internally properly *aligned* with each other, as well as between organization themselves.

In this paper we propose a *conceptual framework* of alignment issues and problems. Ultimately, this framework should assist in designing networked value constellations for e-services, with automated tool support.

In this paper, section 2 introduces a case study that we use to explore and explain our framework. In section 3, we present our framework. We illustrate the framework using the case study (section 4). In section 5, we present our conclusions and discuss potential directions of future research.

2   Case Study: Wireless Internet Access Provision in Hotels

Suppose a hotel would like to offer wireless connectivity to businessmen as an *additional* service. Such a service can be provided as a *joint service* offering of the hotel and of a Telecommunication Company (Telco). The hotel allows the Telco to place WiFi access points (equipment used by the traveler to connect its laptop to), and to place a router that connects the access points to the Internet. Alternatively, the hotel can also buy and place WiFi access points itself, and obtain commodity Internet access from an Internet Service Provider (ISP). How we can reason about these alternatives from an alignment point of view?

3   Perspectives on Designing Networked Value Constellations

A networked value constellation offering e-services requires (1) alignment of the participating organizations (e.g. enterprises and customers, or partners), and (2) alignment of at least four separate perspectives (see Figure 1). The first perspective is about understanding *strategic business goals* and objectives of the various enterprises involved. We have proposed in [3] an approach for stating such goals, based on notions as $i*$ [4].The purpose of this strategy viewpoint is to arrive at a *coherent* goal set of actors that can be used to motivate the *value proposition* perspective. This perspective is used to represent what enterprises offer of *economic value* to each other and what they request in return. Thus, partnering can be also shown. This perspective can be modeled using e^3-*value* [1]. Since the value proposition perspective captures *what* is exchanged of value, but not *how* this is accomplished, we add two additional perspectives. The *business process* perspective presents internal- and inter-organizational business processes, e.g. represented by UML activity diagrams or the BMPN (see http://www.bpmn.org/). The *information system* perspective represents the software & hardware components that operationalize the value proposition perspective. A broad range of modeling tools is available (e.g. UML).

   Modeling the various perspectives is the necessary first step towards the design of networked value constellations. First, various case studies it was shown that many constellations are just too complex. They require thorough formal conceptualization in order to be able to create a shared understanding of the constellation at hand by all stakeholders involved. Additionally, tool support, relying on sound conceptualization, can help to detect inconsistencies between the various perspectives taken, and can provide traceability of design decisions taken.

   Moreover, constellations that are formed to provide IT intensive services rely heavily on IT. The technological and commercial aggregation involves decision makers with different viewpoints from different disciplines. Business developers of value constellations who focus on more commercial issues should be able to express and explain the constellation to software engineers. On the other hand, engineers have the responsibility to address clearly technological issues that influence the successful implementation of the planned business idea. The language of modeling techniques can thus successfully support the decision making by maintaining the shared and common understanding.
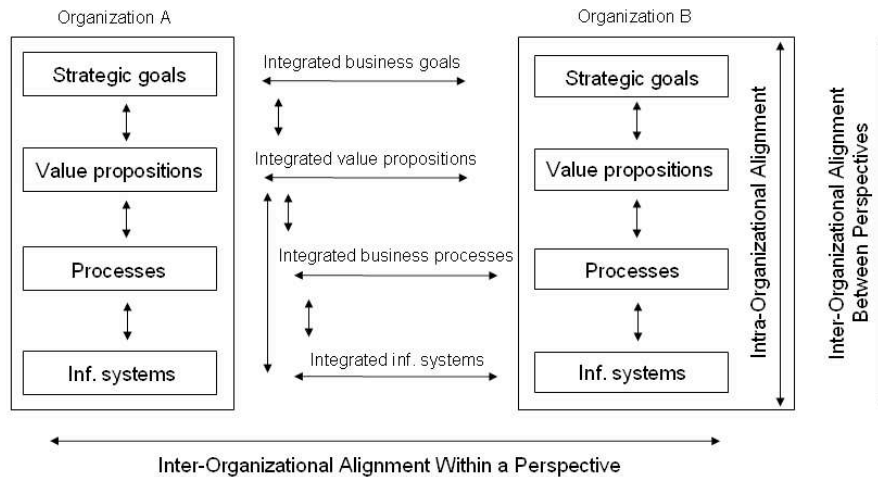
Fig. 1. Initial conceptual framework

The identified perspectives result in various types of alignment decisions:

- alignment decisions *between perspectives on a same organization* (e.g. *internal* processes should contribute to realizing a value proposition of that organization) called *intra-organizational alignment of perspectives*,
- alignment decisions *per perspective between organizations* (e.g. a multi-enterprise value proposition should allow *all* organizations to make profit with it) called *inter-organizational alignment within a perspective*,
- alignment decisions between perspectives *between* organizations (*inter-organizational* processes should contribute to realizing a multi-enterprise value proposition), called *inter-organizational alignment between perspectives*.

Since constellations have to operate in a *competitive* world, we first consider alignment from a *profitability/economic value* point of view: each enterprise in the constellation should be able to make a profit. The value proposition perspective focuses on revenues and expenses; the process and IS viewpoint cause expenses. Since an integrated view on these financials may help to reason about profitability, we propose to use the notion of *value activity* to bring the perspectives together from a financial point of view. Executing this activity generates revenues but also expenses.

In the following sections, we exemplify a few of the fore mentioned types of alignment decisions. Additionally, we show how these can be integrated from a financial point of view. We start with the value proposition viewpoint, and work our way down to the information system viewpoint.

4   Forms of Alignment: A Case Study

4.1   Inter-organizational Alignment within the Value Proposition Perspective

The value proposition perspective is about understanding what organizations in a value constellation offer each other of *economic value*. To do so, we use e^3-*value* (please consult [1] for more information). For the case at hand, there exist at least two alternatives to arrive at a wireless access service: (1) the hotel offers the wireless Internet access *by itself* (Figure 2) or (2) the hotel offers the wireless access *jointly* with a Telco (Figure 3). If the hotel offers wireless connectivity by itself, it operates the required WiFi access points by itself and uses an ISP to have Internet connectivity. A traveler pays the hotel for both the room and the wireless access service and the hotel determines the fee for the wireless service. Alternatively, the hotel is only responsible for room renting; the wireless access provision is completely done by a Telco. The traveler pays separately to the hotel and to the Telco for their services. Additionally, the hotel pays the Telco a small fee for having a WiFi service available for the traveler.
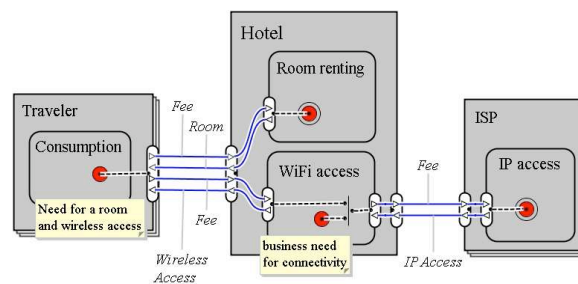

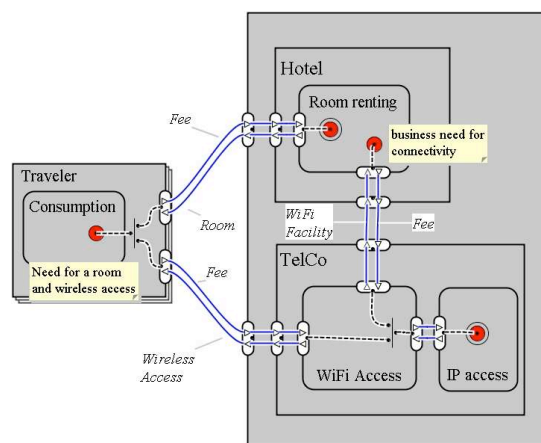**Fig. 2.** Hotel does wireless access provisioning by itself and uses and ISP for Internet access

Fig. 3. Hotel and Telco form a partnership to provide wireless access

Profitability sheets can be constructed, showing the net value flow, for each actor and value activity involved. Since this construction process has been explained in detail in [1], we only show a sample sheet in Table 1. This sheet shows (if attributed with the right numbers) the net money flow for a specific value activity as performed by a business actor. However, this sheet does not take into account additional money out-flows, such as for IT-investments or operations to be performed. For that purpose, we need to explore the other perspectives.

Table 1. Sample profitability sheet for the activity "Wireless access provisioning"

Value proposition perspective			
Value activity: Wireless access provision ("WiFi access")			
Assigned to: Hotel			
Value object in	Value object out	Number of times/timeframe	Economic value
Fee	(Wireless)	# times	Euro …
(IP access)	Fee (to ISP)	# times	Euro …
Total			Euro …

The alignment activity from the value proposition perspective triggers the following questions that influence partnering decisions:

− Which actors execute which value activities (e.g. the WiFi access activity is differently assigned in the two alternatives)?

− Which value exchanges exist between actors (in the first alternative the traveler pays to hotel, in the second alternative to the Telco)?

− How are expenses and revenues divided over actors (if the e^3-*value* model is quantified using profitability sheets (e.g. a result of who pays to whom and thus can set prices))?

To be able to provide acceptable answers further investigation of perspectives is needed.

4.2 Intra-organizational Alignment of Perspectives: Value Proposition and Business Processes

We now focus on WiFi access provisioning activity only. The value proposition already takes into account revenues and expenses but does not consider expenses for business processes and IT yet. Tables 2 & 3 show for a *value activity* of the *value proposition perspective*, the required *operational activities* on the *business process perspective*[1], as well as expenses that go with it. As such, a value activity forms the *linking pin* to operational activities generating expenses and IT investments. Note that

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[1] In e^3-*value*, a value activity is required to make *profit*, whereas an operational activity shows *how* a value activity should be performed and just may incur *costs* and not necessarily profit.

this perspective shows some revenues that can not directly be quantified directly in terms of monetary units (e.g. 'responsibility'). How to involve such effects in the decision making needs to be further researched.

Table 2. Underlying operational activities of wireless access provision performed by the hotel, and potential expenses/revenues of the hotel

Value proposition perspective Value activity: Wireless access provision ("WiFi access") Assigned to: Hotel			
Business process perspective			
Operational activities	Exec.	Expenses	Revenues
Maintenance of connectivity	Third party	Maintenance expenses	No responsibility
Maintenance of infrastructure	Third party	Maintenance expenses	No responsibility
Maintenance of access of guests	Hotel	Maintenance expenses	Hotel determines the price of the service
Maintenance of the physical replacement	Hotel	Additional reorganization	

Table 3. Underlying operational activities of wireless access provision performed by the telecommunication company and potential expenses/revenues of the hotel

Value proposition perspective Value activity: Wireless access provision ("WiFi access") Assigned to: Telecommunication company			
Business process perspective			
Operational activities	Exec.	Expenses	Revenues
Maintenance of connectivity	Telco		No responsibility
Maintenance of infrastructure	Telco /Hotel	Maintenance expenses	No responsibility
Maintenance of access of guests	Telco	H.R. expenses for contracting	No responsibility, hotel can expect revenue sharing
Maintenance of the physical replacement	Hotel	Additional reorganization	

Between the value proposition and business process perspective we have found the following factors that indicate alignment activities:

− Value activities (value proposition viewpoint) require operational activities (process viewpoint) as indicated for the WiFi access provisioning activity,

− Executing operational activities involve expenses but also additional benefits for a specific organization not visible yet on the value proposition activity, and

- The distribution of such expenses and benefits triggers for inter-organizational alignment between value proposition and business process perspectives.

4.3 Intra-organizational Alignment of Perspectives: Value Proposition and Information Systems

We also can relate value activities to the required investments and expenses in IT. Table 4 and Table 5 show expenses and revenues for IT. Expenses can be quantified, and there are intangible revenues (ownership).

Table 4. Information systems and investments of wireless access provision performed by the hotel, and potential expenses/revenues of the hotel

Value proposition perspective Value activity: Wireless access provision ("WiFi access") Assigned to: Hotel			
Information system perspective			
Infrastructure	Owner	Expenses	Revenues
Wireless access points	Hotel	Invest. + maint. expenses	Owned by the hotel
LAN infrastructure	Hotel	Invest. + maint. expenses	Owned by the hotel
Router to the Internet	Hotel	Invest. + maint. expenses	Owned by the hotel

Table 5. Information systems and investments of wireless access provision performed by the telecommunication company, and potential expenses/revenues of the hotel

Value proposition perspective Value activity: Wireless access provision ("WiFi access") Assigned to: Hotel			
Information system perspective			
Infrastructure	Owner	Expenses	Revenues
Wireless access points	Telco		No responsibility
LAN infrastructure	Telco/ Hotel	Hotel might have invest. expenses	Responsibility depends on the ownership
Router to the Internet	Telco		No responsibility

Between the value proposition and information system perspective we have found the following factors that indicate alignment activities:

- Value activities (value proposition viewpoint) require information system components (both application and infrastructural driven) as indicated for the WiFi access provisioning activity,

- These information system components involve expenses for a specific organization that are not visible yet on the value proposition activity (namely investment costs and reoccurring expenses, e.g. for maintenance), and

– The distribution of such expenses and benefits triggers for inter-organizational alignment between value proposition and information system perspectives.

5 Conclusion and Further Research

In this paper, we have proposed a four-perspective (ranging from strategic goals to IT) framework for discussing business/IT alignment in networked value constellations. Alignment can be between perspectives within a same enterprise but can also be between various enterprises in case of networked value constellations. Moreover, as a third dimension, alignment can be between perspectives spanning multiple enterprises. As a first criterion to align goals, value propositions, processes and IT, we propose to use profitability for each actor involved in the constellation. To that end, we need to collect financials (revenues and expenses) from each perspective, to make a first assessment whether each actor can be profitable. In next steps, other alignment criteria then can be considered. We will continue our research by exploring an industrial strength case study in the field of energy supply. Here, we will study the mentioned perspectives and use financial data to address alignment decisions.

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