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More than a gut feeling:
Ensuring your inter-organizational business model works

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Abstract

We present an approach, called BIZ2BIS (from Business Models to the Blueprint of the Information System), to help design, discuss, and evaluate inter-organizational business models without a central point of authority, and also derive high-level requirements for their underlying IS. Its iterative and incremental nature enables the identification of attractive value propositions for all participants, thus ensuring a resilient value network. We have used three case studies to craft the first draft of our approach, accounting for principles, ideas, and concepts from the business model field. We then used action research to refine it, while simultaneously assisting a consortia tasked with setting up an inter-organizational business model and supporting IS for a wine producing region. The varied viewpoints provided by BIZ2BIS and its systematic nature enable the analysts to cope with the complexity of modern networked business models and their IS implications in an integrated manner.

Keywords: Business models, information systems, high-level requirements.

1 Introduction

Information and communication technologies have been gradually changing the playing field for organizations. The unprecedented ubiquitous connectivity achieved at negligible costs reduced coordination and transaction costs among firms (Heck & Vervest 2007). The balance between external and internal transaction costs in firms (Coase 1937; Coase 1960) changed dramatically, leading to the emergence of new organizational structures. It became cheaper and more convenient to procure, contract, and coordinate the services of globally distributed partners than to integrate all the needed functions in-house. In this context, in which the Internet is used as a business

platform, firms are more properly viewed as participants in multiple networks (Gulati, Nohria & Zaheer 2000). Organizations were given the chance to open their boundaries and define innovative processes with different business rules and original value propositions.

Existing approaches to business model design and evaluation usually neglect this complexity of partner networks. They do not manage the contributions and returns of the participants to ensure that all end up with attractive value propositions, that, in turn, ensure the collective satisfaction of the network (Iansiti & Levin 2004). Vague business ideas can hide inconsistencies and lead to false assumptions. This lack of information and imprecision can compromise the elicitation of business constraints that ultimately should be met by the IS supporting the business model (Gordjin 2002). Even though it is recognized that there are clear advantages in tracking these mutual influences (Chan & Reich 2007), the business model implications for the design of its supporting IS is underrepresented in the literature (Bouwman et al. 2012). To answer this, we developed BIZ2BIS, an approach to help design, discuss, and evaluate inter-organizational business models without a central point of authority and also derive high-level requirements for their underlying IS.

In the remainder of the paper we detail BIZ2BIS as follows: in section 2, we introduce the work related with our proposal. Then, in section 3, we describe the four phases of BIZ2BIS, illustrate its steps and supporting artifacts. Finally, in section 4, we present the conclusions and discuss future research.

2   Related work

To develop BIZ2BIS, we started by reviewing the literature on business models. To make sense of the field, we used the framework proposed by Pateli and Giaglis (2004) with its seven-subdomains (definitions, components, taxonomies, representation models, evaluation, adoption factors, and change methodologies). By reviewing definitions and components, we became aware that concepts like value propositions, partnerships, business architecture, financial issues, performed activities, or available resources stood out. Most of these concepts were also present in the proposals capable of visually representing business models. In spite of the noted limitations (the proposals graphical notations were not much elaborated), we detected an additional effort in detailing the activities performed by the actors and the resulting business flows (e.g., financial, information, goods and services, and intangibles). In turn, the subdomain taxonomies showed us a tendency in perceiving different categories of business models (e.g., freemium, razor/blades, or reverse auction) as building blocks that can be combined in multiple ways, as jump-starts of a creative business model process of discussion (Osterwalder & Pigneur 2010; Johnson 2010).

When researchers like Osterwalder (2004), Shafer et al. (2005) and Morris et al. (2005) started to synthesize the research mentioned above, they created a base of knowledge that promoted the development of conceptual tools. The Business Model Canvas (Osterwalder & Pigneur 2010), the e3-value ontology (Gordjin 2002), and the STOF framework (Bouwman et al., 2005a) are unavoidable references in the field. They showed us the importance in defining an outlined plan for the application of BIZ2BIS to

offer guarantees that its users do not overlook critical issues. The former two inspired us to use our approach as an effective communication tool to discuss business models and promote collaborations with all the participants. The latter two underlined the importance of examining the network of relationships in which firms are implanted and the role of the IS. The e3-value ontology establishes a link between value propositions and their underlying business processes, while the STOF framework details how the service offering can be carried out from a technical perspective. However, despite the previous efforts, there is still a gap between business model design and the specification of the IS to enable and support it. Furthermore, that gap needs to be bridged in a manner understandable by all business and technical stakeholders.

When exploring the remaining sub-domains of the Pateli and Giaglis framework (2004) (evaluation, adoption factors, and change methodologies), we became aware of additional lines of research. There were no indications on how to address social factors in the development, adoption, or modification of real-world business models, which can also compromise the identification of the features that the supporting IS should satisfy. Furthermore, the existing proposals to evaluate business models were mainly focused on financial flows (Linder & Cantrell 2000; Gordijn 2002). However, we share Allee's (2008) conviction that the benefits obtained through intangible forms of value can be vital in disclosing motivations for partners to engage with a network. Gathering this extra knowledge on intangible flows enhances network comprehension and provides valuable hints to design, discuss, and evaluate the network. We also acknowledged the difficulty in evaluating all kinds of value propositions using an economic unit of measure. For instance, the financial value assigned to a product or service is very volatile; what was established when conceiving the business model may not be valid after a month. Furthermore, something that can be extremely valuable for an actor, may not appeal to another.

Table 1 summarizes the various contributions from the literature that had a role in shaping our approach.

Number	Author	Influence in the development of BIZ2BIS
Guideline 1	Timmers (1998), Al-Debei and Avison (2010)	*Address dimensions of the business model concept such as value proposition, value architecture, value network, and value finance*
Guideline 2	Osterwalder (2004), Shafer et al. (2005)	*Take into account business model components like value proposition, technology, revenue model, customers, distribution channel, and partners*
Guideline 3	Gordijn (2002), Osterwalder (2004), Bouwman et al. (2008)	*Define an outlined plan for using the approach in the field, in order to ensure that critical issues are not overlooked*
Guideline 4	Gordijn (2002), Osterwalder (2004)	*Use the approach as a communication tool to reflect on, discuss, innovate, and articulate a business model*
Guideline 5	Shafer et al. (2005), Gordijn et al. (2009)	*Address the potential offered by the network concept in the business model domain*
Guideline 6	Allee (2008)	*Detail the kind of ties established among the network participants to elicit clues on how these could strengthen the business model or obstruct undesirable movements*

Number	Author	Influence in the development of BIZ2BIS
Guideline 7	Osterwalder and Pigneur (2010)	*Develop easy-to-use field tools that promote collaboration among all the stakeholders*
Guideline 8	Gulati et al. (2000)	*Identify vital dependencies in a the networked business model (e.g., important resources, indispensable actors, and critical value propositions)*
Guideline 9	Normann and Ramírez (1993), Iansiti and Levin (2004)	*Develop negotiation mechanisms to promote eventual adjustments to new circumstances and balance the network pursuit for joint value creation*
Guideline 10	Gordijn (2002), Bouwman et al. (2012)	*Acknowledge the need to change, to reconsider adopted options, revisit past assumptions, and rebuild taking into account new contexts*
Guideline 11	Gordijn et al. (2009), Bouwman et al. (2012)	*Make use of alternative business model scenarios to encourage discussion and explore new opportunities*
Guideline 12	Pateli and Giaglis (2004),	*Address social factors in the discussion, design, adoption, and change of business models*
Guideline 13	Tapscott et al. (2000), Allee (2008)	*Consider other influences beyond financial flows in the business model evaluation (e.g., prestige and brand recognition)*
Guideline 14	Gordijn (2002), Bouwman et al. (2012)	*Explore connections points between business models and their technological support*
Guideline 15	Gordijn (2002)	*Translate business models into high-level requirements for the specification of its underlying IS*

Table 1: Guidelines for the development of BIZ2BIS

Supported by the literature review, we used the first draft of BIZ2BIS and two of its updated versions to analyze our three case studies. They enabled us to test and improve BIZ2BIS (e.g., concepts, phases, steps, and artifacts), as well as to detect and weed out any glaring omissions or misfits, before moving on to our last case, a complex action research project (2 Million Euros). We used BIZ2BIS to describe the scenario under study, diagnose problems, support negotiations, conceive interventions, readjust the business model, evaluate value propositions, and reflect on the obtained findings (for researchers and practitioners). Next, we present the resulting version of our approach.

3   BIZ2BIS: Business model and IS design

BIZ2BIS consists of four phases. In *Phase I* – "Business model characterization", we characterize the network, by identifying its actors and detailing their relationships. Then, in *Phase II* – "Business model refinement", we analyze the network and suggest eventual adjustments to better align the interests of the actors. In *Phase III* – "Stability assessment", we assess the business model stability by systematically verifying if the value propositions in the business model bring benefits to all the actors. In *Phase IV* – "Information system specification", we use the gathered information about the network and its actors, as well as the arrangements established to align their interests, to detail the high-level requirements of the IS underlying the business model in a service-oriented fashion.

The approach is flexible enough to interrupt, at any moment, the sequential order of its phases and return to previous ones in order to answer to unexpected network events or

to indications ascertained when applying its steps. For instance, if a new actor is identified, independently of the phase in use, it is mandatory to return to Phase I. This flexibility enables BIZ2BIS to account for the dynamic nature of the networks, as suggested in the literature, Guideline 9 (Table 1). The importance of defining an outlined plan for using the approach was inspired by the Guideline 3 and 9 (Table 1).

3.1   Phase I - Business model characterization

Phase I analyzes the business model by looking at its network. It comprises the identification and characterization of the participating actors, as well as their relationships. It consists in three steps with complementary perspectives:

- *Step I.a* – "Exploration of the business model": allows analysts to specify the aims of the networked business model, who contributes to its success, and how, as well as contextual influences that guide the performed activities. It is supported by the "Networked business model chart" (Table 2) and was inspired by the literature, namely guidelines 1, 2, 4, 5, 8, and 12 (detailed in Table 1).

- *Step I.b* – "Description of the participating actors": identifies actors and describes their roles, relationships, as well as expectations through the "Actor description chart" (Table 3), which should be filled for each actor. Guidelines 6 and 8 (Table 1) inspired this step.

- *Step I.c* – "Representation of the business model": represents the business model using two different tools: the "Flow Diagram" and the "Flow Matrix". The former depicts the business model using a graph notation, in which the nodes represent the actors and the arrows the direction of the business model flows. These are categorized in four types: material or service, finance, information, and intangible connection (e.g., reputation, influence, and cooperation). To avoid the need to follow intricate configurations of arrows, the latter tool shows the same data in a matrix. The "Flow Matrix" should be read as indicated by the red arrow, starting with the "actor-source" (lines) and moving upward to the "actor-target" (columns). *Step I.c* was inspired by guidelines 6 and 8 (Table 1).

Business model scenario	The name assigned to the business model
Network goals	*Gathers all the data obtained, analyzes it, and presents a first draft of the network's goals*
Network opportunities	*Describes advantageous circumstances that can arise if the network is created*
Network threats	*Identifies possible threats to the network creation or maintenance*
Mutual obligations and expectations	*Describes established commitments and provides indications about the degree of cooperation in the network*
Shared interpretations and representations	*Identifies common codes, languages, and narratives that guide actors behavior*
Existing rules	*Describe policies that the actors must adhere to*
Available resources/actors	*Identifies the existing resources and the actors who provide them*

Business model scenario	The name assigned to the business model	
Institutional sanctions	*Describes actions that must be carried out if the actors do not follow an acceptable behavior*	
Version: 0.3	**Date:** DD/MM/YYYYY	**Author:** First name Surname

Table 2: "Networked business model chart"

Description of the actor	Identification of the actor	
Network interactions	*Depicts the interactions of the actor in the network*	
Relationships and flows	*Details the business flows, e.g., information, associated with each interaction of the actor*	
Roles	*Describes the activities carried out by the actor*	
Goals	*Identifies the individual interests of the actor*	
Business model: Name	**Version and Date:** 0.3, DD/MM/YYYY	**Author:** First and Surname

Table 3: "Actor description chart"

Table 2 provides a succinct view of the main guidelines established for the business model by its proponents. Table 3 provides clues on the business model participants. In turn, Figure 1 exemplifies a "Flow diagram" of the conceived business model on the left side and its corresponding "Flow matrix" on the right side (based on the data obtained in Table 2 and Table 3).
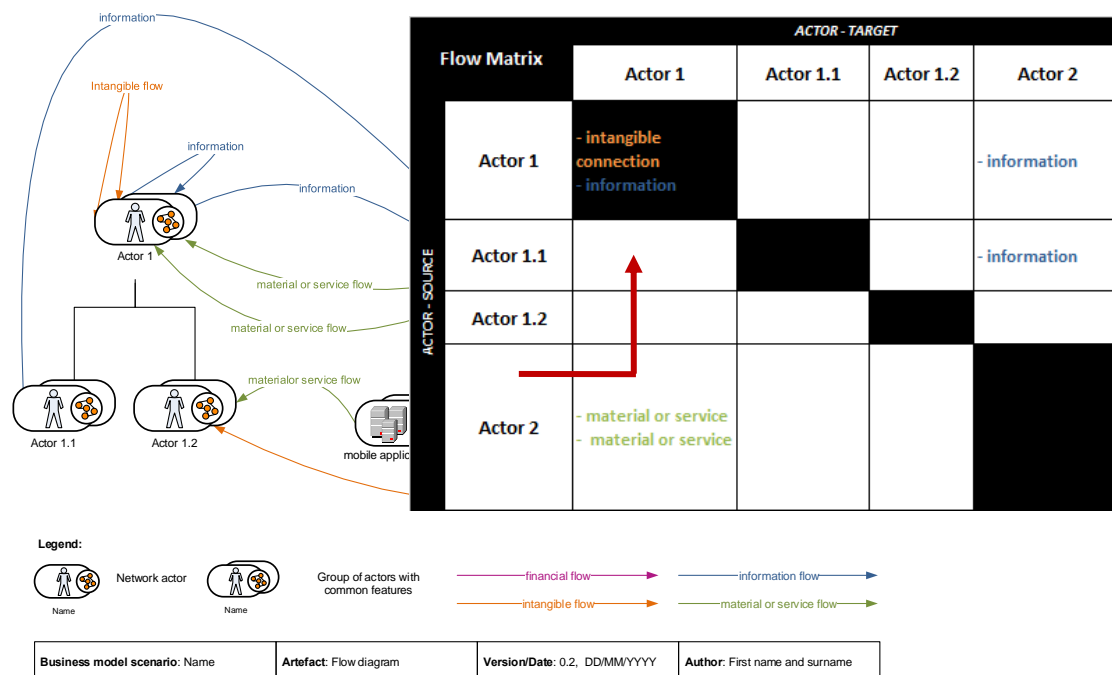

Figure 1: "Flow Diagram" and "Flow Matrix"

3.2   Phase II – Business model refinement

Having detailed what was planned for the networked business model, as well as the expectations of its participants in *Phase I*, *Phase II* addresses the need to perform refinements by providing a negotiation mechanism that looks for alignments among actors. This phase takes an optimistic view of the negotiation process, searching for win-win value propositions based on the assumption that the actors are engaged in a positive-sum activity in which they jointly create value. Five steps support *Phase II*:

- *Step II.a* – "Detection of dependencies among goals": - highlights how the goals of each actor contribute to reaching the aims of the overarching value network. It also exposes the dependencies among those goals and discloses how individual expectations interlock in a network of interactions that directly influences the ultimate business model objective. *Step II.a* uses the "Common goal diagram" (illustrated at the top of Figure 2) to support its analysis. In its upper part shows the network goal(s). Below, it depicts the goals of the actors in several lanes, one per actor, that support the overarching network goal. The bonds among actors' goals are represented through arrows. For instance, "Goal 1 of the Actor 3" depends on "Goal 1 of the Actor 2" and on "Goal 1 of the Actor 1". It is also possible to show that "Goal 3 of the Actor 3" is extremely dependent from the user's goals. These insights enable the exploration of appealing synergies (e.g., possible cooperation), or risky situations (e.g., implications of actor abandonments) that can support or jeopardize the accomplishment of the business model goals. *Step II.a* was inspired by guidelines 4, 6, and 8 (Table 1).

- *Step II.b* – "Identification of actor affinities": supports the identification of goals common to various actors and promotes collaborations to minimize individual effort. It uses the "Actors/Goals affinity chart" (the middle chart in Figure 2) that maps the actors (first column) to their identified goals (first row) based on the data collected about the actors in Phase I. If a certain actor intends to accomplish a given goal, an "X" is placed at their intersection. This step points out common goals, which provides clues in order to strengthen the collaborations or minimize conflicts/problems identified in *Step II.a*. Guideline 6 (Table 1) inspired this step.

- *Step II.c* – "Negotiation of actor contributions": balances gains and efforts of the actors involved in the goal to clarify their interests. *Step II.c* uses the "Negotiation diagram" (the middle figure in Figure 2) to illustrate the analysis of the "Goal 1 of the Actor 3", identified in *Step II.a* as critical. The diagram places it and the actor(s) that own(s) it at the center of the diagram. Below are the actors that carry out the supporting activities that sustain the central goal achievement (based on the data collected in *Phase I*). We rated the effort spent, as well as the gain obtained on these activities in a scale from $\{1, ..., 5\}$. The gain obtained has two beneficiaries: the actor(s) that own(s) the goal under study (at the center of the diagram) and the set of actors that directly benefit from its achievement (the ones at the top).
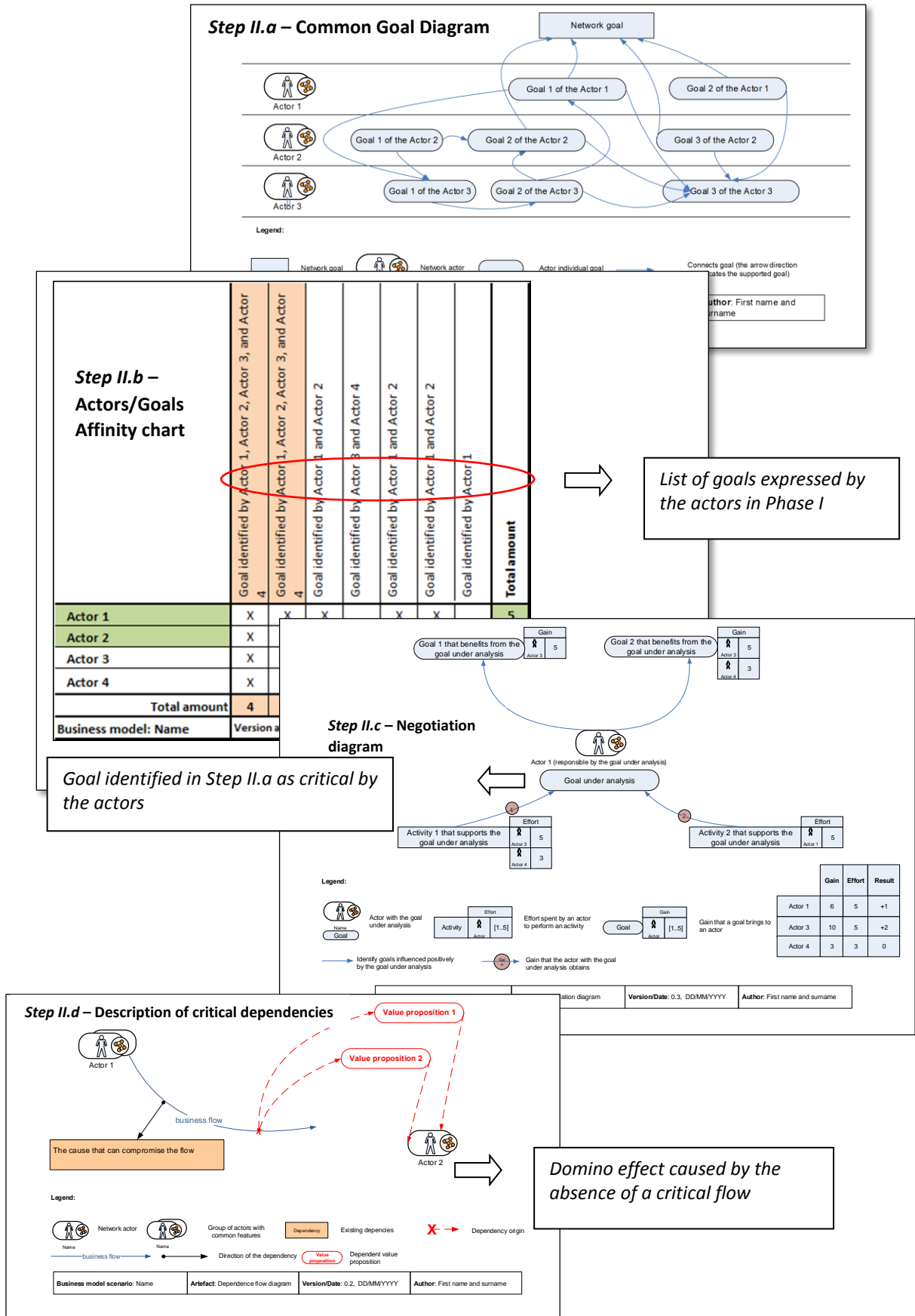
Figure 2: Artifacts of *Step II.a*, *Step II.b*, *Step II.c*, and *Step II.d*

The results achieved for each goal in *Step II.c* cannot be analyzed from a narrow perspective. For instance, a goal may not be appealing for a particular actor, but the business model may offer other advantages that can make it worthwhile. When a positive balance is not reached, analysts should initiate a negotiation process and consider adjustments to the conceived business model in order to stimulate and encourage actors' participation. Analysts should base their attempts on the data gathered in the previous steps of BIZ2BIS. *Step II.c* was inspired by Guidelines 9, 10, and 11 (Table 1).

- *Step II.d* – "Description of critical dependencies": discloses domino effects caused by the extinction of a particular business flow. For instance, if an actor leaves the network, his/her activities will not be performed and the resulting flows will be compromised, which will consequently jeopardize value propositions that depend upon those flows, as well as the aspirations of participating actors interested on those value propositions. The "Dependency flow diagram" (on the bottom part of Figure 2) depicts these dependencies, which can help analysts mitigate possible threats. When indications of events that may jeopardize the business model no longer exist, analysts should advance to *Step II.e*. *Step II.d* was inspired by Guideline 8 (Table 1).

- *Step II.e* – "Stabilization of value propositions": uses the data gathered in the previous steps of BIZ2BIS to list the existing business flows. Then, based on the contribution of the flows to the activities performed by the actors, analysts should refine and stabilize the list of value propositions provided by the business model. The analysis of the existing relationships is supported by the "Business flows/Value propositions chart" (Table 4), which maps all the flows (first column) into all the derived value propositions (first row). If a certain flow gives rise to, contributes to, or influences, a given value proposition, that situation is marked with an "X" at the intersection.

Business flow/Value proposition chart		Value proposition supported by the business flows	Value proposition supported by the business flows	Value proposition supported by the business flows	Value proposition supported by the business flows	Number of relationships
		V1	V2	V3	V5	
Business flow (material or service, finance, information, or intangible connection) obtained from Phase I, Step I.c	F1	X	X	X	X	4
Business flow (material or service, finance, information, or intangible connection) obtained from Phase I, Step I.c	F2	X	X	X	X	4
Business flow (material or service, finance, information, or intangible connection) obtained from Phase I, Step I.c	F3	X				1
Business flow (material or service, finance, information, or intangible connection) obtained from Phase I, Step I.c	F4			X		1
Number of relationships		3	2	3	2	
Business model: Name		Version and Date: 0.3, DD/MM/YYYY			Author: First name and	

Table 4: "Business flows/Value propositions chart"

3.3   Phase III – Stability assessment

Phase III, *Step III.a* – "Evaluation of actors perspective" assesses the idealized business model based on the value propositions obtained in *Phase II*. The performed evaluation integrates two perspectives (inspired by Guideline 13, Table 1). One shows the actors' perception of the effort spent to support the value propositions, as well as the gain obtained. The other discloses how the actors perceive influences among value propositions and may expose dependencies not yet detected.

The "Interview chart" (at the top of Figure 3) supports the evaluation performed by the actors. It maps each one (second column) with the identified value propositions (first column). We represent the relationship among the two by pairs of integer numbers (g, e), where "g" represents the gain obtained with a value proposition in the range {1,...,5}, and "e" denotes the effort involved in the range {-1,...,-5}. The influences that a specific value proposition has on others is available in its own row, after the pair (g, e), and

separated by a "/", such as $(g, e)/^{[(+|-)(Vi)]^+}$, where "+|-" further informs whether that same value proposition has a positive ("+") or negative ("-") impact towards the value proposition "Vi". The superscript "+" denotes iteration, since a value proposition may influence none, one, or more value propositions. Figure 3 exemplifies the "Interview chart". For example, it shows that "Actor 1" assigns an effort of "5" to support V3 and assigns an importance of "1" to the benefits obtained from it. Taking into account all the value propositions, the balance between gain and effort shows if the actor is pleased or, on the contrary, disappointed. In this case, extra benefits must be considered to maintain the actor in the network.

To relate the different concepts used in BIZ2BIS, we developed the "Value proposition traceability diagram" (at the bottom of Figure 3). Its compact representation traces the business flows (the dashed rectangle), their supporting activities (the rectangles), the actors that perform them, as well as dependencies among value propositions based on the data filled in by the actors in the "Interview chart". In this example, it shows the influence of V3 on V1 and V5 (the relationship between the rounded rectangles): the plus sign means that one value proposition influences other(s) positively, while the minus implies a negative influence. By exposing the influences among the different value propositions, we have the chance to identify critical actors and value propositions, anticipating potential problems.
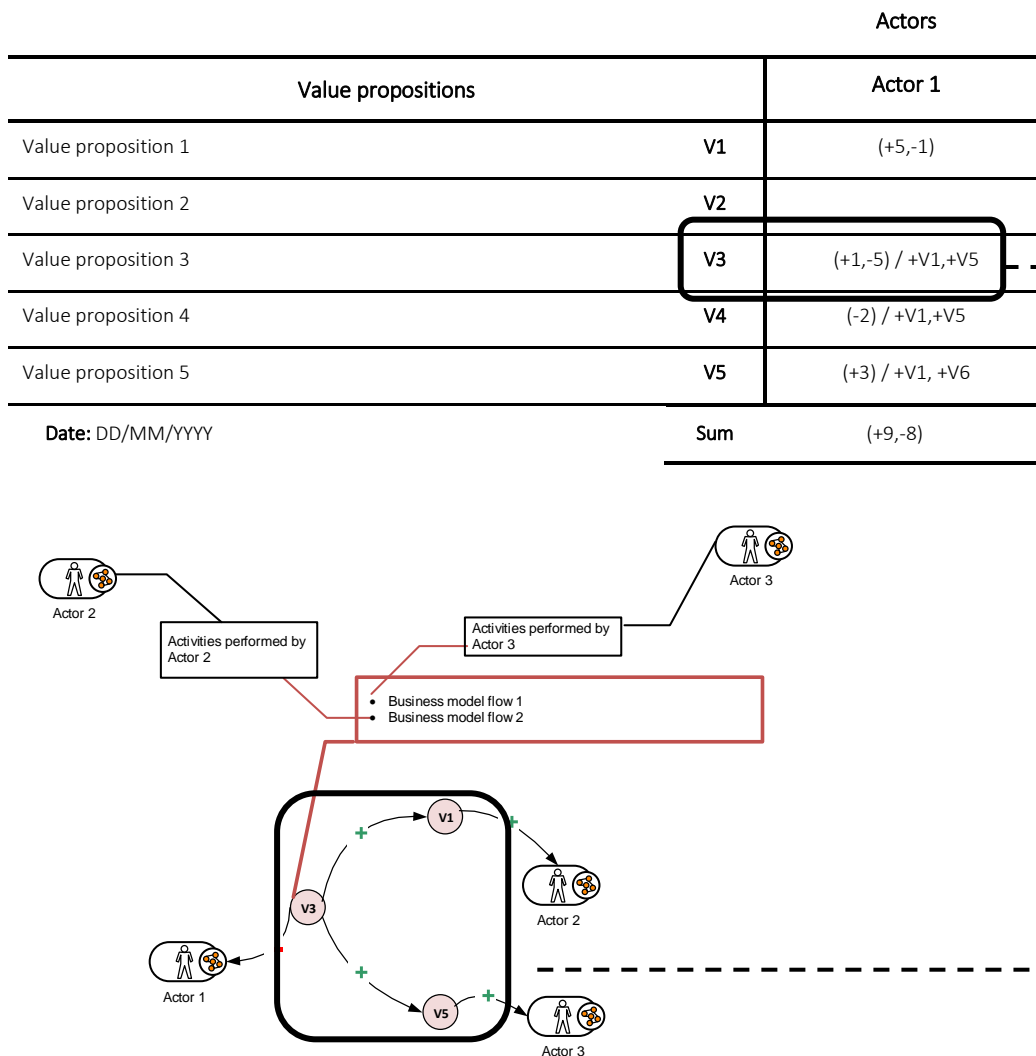
Value propositions		Actors
		Actor 1
Value proposition 1	V1	(+5,-1)
Value proposition 2	V2	
Value proposition 3	V3	(+1,-5) / +V1,+V5
Value proposition 4	V4	(-2) / +V1,+V5
Value proposition 5	V5	(+3) / +V1, +V6
Date: DD/MM/YYYY	Sum	(+9,-8)

Figure 3: "Interview Chart" and the "Value proposition traceability diagram"

3.4   Phase IV- Information system specification

When an agreement is achieved, analysts should advance to *Phase IV*, *Step IV.a* – "Consolidation and description of requirements" (it was inspired by Guidelines 14 and 15, Table 1). *Step IV.a* establishes a bridge between business models and their supporting IS by using the data obtained in the first three phases of BIZ2BIS to identify and detail the features to be provided. To enable this translation of knowledge, we used the concept of service (Marks & Bell 2006), which establishes a point of contact between what organizations provide to their customers or partners, and the functionalities delivered via the interface of an IS. As a result, we developed the "Service specification chart" to detail the services that must be provided to make the value propositions acknowledged by the available actors (in *Phase II*, *Step II.e*, "Business flows/ Value propositions chart"). Table 5 exemplifies this artifact.

Business model	Service Specification	
Name/Identifier	*Presents the service name and its identification number*	**Id: 1**
Version	*Identifies version, data, and author*	
Goal	*Presents the aim of the service (data obtained from Phase II, Step II.e)*	
Description	*Describes the activities performed when using it (based on Phase II, Step II.e)*	
Actor that provides the service	*Identifies the actor(s) that provide(s) it (data obtained from Phase I, Step I.b and Step I.c)*	
Actor that uses the service	*Identifies the actor(s) that use(s) it (based on Phase I, Step I.b and Step I.c)*	
Input data and their source	*Depicts input information flows and their source (data obtained from Phase I, Step I.b and Step I.c)*	
Output data and its target	*Describes output information flows and their target (data obtained from Phase I, Step I.b and Step I.c)*	
Service dependencies	*Identifies supporting services (data obtained from Phase III, Step I.a)*	
Access control mechanisms	*Details permissions and access rights (data obtained from Phase I, Step I.a)*	
Business flows leading to the service	*Identifies the business flow(s) that contributed to the service detection (data obtained from Phase II, Step II.e and Phase I, Step I.c)*	
Reasons for its existence	*Explains the motives behind the service creation (data obtained from Phase I, Step I.a and Step I.b)*	
Service restrictions	*Presents the rules employed by the service in its activities (data obtained from Phase I, Step I.a and Step I.b)*	
Information system support	*Describes how the IS supports the service (based on Step I.a and Step I.b)*	
Remarks	Additional data	

Table 5: "Service specification chart"

Analysts and IT teams can easily perceive the actors that interact with the service, how they do it, the reasons for the service existence, the involved business flows, the activities related to the service, rules that govern its operation, and how the IS should made it available. At the end of *Step IV.a*, a service-oriented high-level specification of the supporting IS is available as the full set of "Service specification charts" - a blueprint of how a network of organizations creates and delivers value.

4 Conclusion

BIZ2BIS guides the search towards stable networked business models. It gathers data on the network, its context, and its actors to clarify and expose their different opinions, preferences, and instincts. By providing a common language between analysts and practitioners, the approach encourages the collaboration of the latter and promotes communication and discussion among all the involved. Its insights support the actors with the power to make decisions to carry out adjustments in inter-organizational business models.

Our proposal was inspired by the review of the field literature, which allowed us to identify key topics to take into account. However, we complemented the existing common ground with additional perspectives of analysis. First, we introduced a negotiation mechanism to promote the alignment of the actors' interests. Second, we moved beyond the usual accounts of an organization business model and focused our attention on inter-organizational business models. Third, we involved the participating actors in the evaluation of the conceived business models and introduced more than

economic units of measure (e.g., data and intangible flows). Fourth, taking into account the wealth of information collected by BIZ2BIS, we gathered promising conditions to overcome the gap between business models and the development of their IS. The concept of service helped us to establish a point of contact between the value propositions made available and the internal business processes supported by the IS, which allows BIZ2BIS to derive the high-level requirements of the underlying IS in a business model driven way. The increasing importance assigned to the co-creation of value propositions and service innovation, led us to our future research aim: use BIZ2BIS' ability to characterize the network in order to design service-oriented architectures in a systematic way.

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