E^3*FORCES*: ANALYZING AN ORGANIZATION'S STRATEGIC POSITION USING A MODEL BASED APPROACH

Abstract

In networked value constellations, organizations jointly create value and satisfy complex customer needs by offering multi-supplier bundles of products. Increasingly these products are actually e-services, which can be ordered and provisioned via the Internet. A key problem is how to dynamically, and on-the-fly, compose constellations which provide e-service bundles. A prerequisite for each enterprise is that participation should be sustainable and attractive. Therefore, a participating organization should at least be able to find a strategic position in which the organization can execute its own chosen business strategy. To this end we propose the conceptual modeling technique e^{3}forces, which enables us to analyze the "match" between an organization's business strategy and strategic position in its environment. E^{3}forces enables us to quantify the impact of environmental business forces on products/services acquired and offered by an organization. This analysis, based on Porter's Five Forces framework, allows us to determine the match between an organization's strategic position and business strategy. An e^{3}forces model allows for a computational implementation, and therefore can be the first step in a (semi)-automated composition process for networked value constellations. We illustrate e^{3}forces by a case study in the field.

Keywords: Business Strategy, Strategic Position, Conceptual Modelling, Networked Value Constellation

1 INTRODUCTION

Due to the worldwide connectivity provided by the Internet there has been a shift in the last decades from linear cross-organizational cooperation – eg. value chains (Porter, 1985) - toward complex *networked value constellations* of organizations which *jointly* create value for specific customers needs (Tapscott, 2001). Yet, although participating in such a constellation may benefit profits, it increases the complexity of *correct* and *formal understanding* of the organization and the constellation (Gordijn & Akkermans, 2003). Such constellations are complex because the products and services offered by networked value constellations must not only be supported by cross-organizational information systems, there also has to be proper cross-organizational process coordination. In addition, each organization in the constellation must be *profitable* (Gordijn & Akkermans, 2001) and, from a business perspective, the product/service offered must be *sustainable* (Porter, 1980).

A prerequisite for product/service sustainability is that the *business strategy* of the organization offering the product/service must "match" the organization's *strategic position* (Porter, 1980; 1985). The strategic position of an organization is its position in regard to other organizations in its business environment (eg. suppliers, buyers and competitors) (Porter, 1980; 1985). For an organization participating in a networked value constellation the *other* organizations in its environment are first and foremost the organizations with which the organization forms a *networked value constellation*.

We perceive *automated* matching of an organization's strategic positioning with the organization's business strategy as a key research problem. Automated matching is important due to the increasing importance of e-services; which are just like normal services – activities and deeds of a mostly intangible nature – but e-services can be offered *and* provisioned online. Typically, a complex e-service is offered by a constellation of organizations (e.g. consider the offering of xDSL, which is usually a cooperation between a telecom operator and an Internet Service Provider). To participate in such a constellation, it is important that an organization's chosen business strategy is consistent with its position in the constellation. Ultimately, we want to automatically compose constellations which offer e-services that satisfy complex needs on-the-fly (if a need emerges). To achieve this, organizations should be able to determine - semi-automatically and in a very short time frame - whether its business environment, drawn up by the constellation, matches its business strategy.

To this end we propose the conceptual modelling technique *e³forces*. Following a semi-formal - and in the future semi-automated - approach, *e³forces* enables us to analyze the match between an organization's strategic position and business strategy. The *e³forces* technique rigorously *defines* and *visualizes* these business concepts and their relationships (eg. strategic position, business strategy and environmental business forces); thereby creating *shared understanding* of these concepts among various stakeholders. Furthermore, we analyze the *influence* of various environmental business forces on the products and services acquired/offered by the organization to determine whether an organization's business strategy is executable within a certain strategic position. This analysis is based on business theories created by Porter (1980; 1985). These theories state that if an organization wants to offer a *sustainable* product or service a strategic position must be found - in terms of environmental business forces - which enables the organization to execute its business strategy (Porter, 1980; 1985).

We take a conceptual model based approach as the goal of a conceptual modelling technique – to create *in depth, formal* and *shared understanding* among various stake-holders (Borst, Akkermans, & Top, 1997) – matches our purpose to ultimately arrive at automated composition of constellations. Conceptual modelling techniques create shared understanding by rigorously *defining* and *conceptualizing* various concepts. This enables users to create clear and unambiguous graphical models and conduct *semi-automatic analysis;* which exactly is our intention. Traditionally, such conceptual modelling techniques were used to analyze and understand (cross-organizational) information systems (eg. UML (www.uml.org)) and process coordination (eg. BPMN (www.bpmn.org)). In recent years however, conceptual modelling techniques have been developed to

analyze the business aspect (eg. profitability) of networked value constellations (eg. *e³value* (Gordijn & Akkermans, 2001)).

Yet, to the best of our knowledge, there is currently no conceptual modelling technique which analyses the relationship between an organization's business strategy and strategic position in a networked value constellation setting. *i* (*eye-star) does take strategic aspects into consideration (Yu & Mylopoulos, 1995). However, *i**'s "strategy" constructs are grounded in quite general agent-based theories and not in specific *business strategy* theories; well known basic business strategy concepts are *not* considered. The *e³forces* conceptual modelling technique is therefore unique since it does take actual business strategy concepts into account (eg. business strategy and strategic position). Furthermore, *e³forces* is truly able to analyze and reason about the *strategic sustainability* of organizations within networked value constellations.

To demonstrate and analyze our claims we have conducted a case study at a start-up Internet company. Such a case is very suitable for our *e³forces* modelling technique, since such organizations have difficulties, or even neglect, finding a proper strategic position.

This paper is constructed as follows: first we will discuss the research methodology and business theories. Subsequently we present *e³forces's* constructs and discuss how buyers and suppliers influence the products/services offered/acquired by actors in a constellation using a case study in the field. Finally, we reflect on *e³forces* for analyzing buyer and supplier influences, present conclusions and make suggestions for further research.

2 RESEARCH METHODOLOGY

To arrive at our ultimate goal – a computational analysis of strategic positioning – extensive conceptual modelling activities on "*business strategy"* are required. Yet, by analyzing the relationship between an organization's business strategy and strategic position with the aid of a conceptually modelling technique, this research approach represents a departure from both traditional quantitative and qualitative modes of scientific research on two different accounts (Baida, Gordijn, Akkermans, Saele, & Morch, 2006; Hevner et al., 2004):

1. On the theoretical level, modelling techniques are used as a tool for rigorous theory articulation, here about strategic positioning, since modelling techniques formally and conceptually "explain" a real-world domain. As a theory, a formal modelling technique is typically not expressed in terms of variables as is common in quantitative social and business research. Modelling techniques are usually formalized qualitative theories concerning conceptual "artefacts" shared by a community of practice in a domain (Hevner et al., 2004). Although this does not necessarily imply that they are congruent with the interpretivist or naturalist perspectives common in qualitative research.
2. Qualitative and quantitative approaches have in common that they assume that scientific goals lie in (different forms of) explanation. In contrast, our modelling technique approach is more tailored toward problem solving (eg. analysing whether a strategic positioning is consistent with a business strategy) and designing innovation in business practice. Modelling techniques are better seen as an approach, whereby the quality and success of the model is assessed in terms of whether it is good enough to help in problem solving.

These two differences have implications for the empirical validation of research studies in IS. To test a modelling technique's empirical, epistemological adequacy *case studies* (as done in this paper) are considered the preferred method (Baida et al., 2006).

3 BUSINESS STRATEGIES

When taking business strategy theories into account it is convenient to choose between two distinctive, yet complementary, schools on "business strategy". One school considers the *environment* of an organization as an important strategic motivator; the other school focuses on *internal competences* of

an organization. The first school originated from the work of Porter (1980; 1985), and successors (Tapscott, Ticoll, & Lowy, 2000). It believes that the business strategy of an organization is influenced by *business forces* in the organization's *environment*. An organization should position itself such that competitive advantage is achieved over the competition and threats from the environment are limited. The second school considers the *inside* of an organization to determine the best strategy. This school is rooted in the belief that an organization should focus on its *unique resources* (Barney, 1994) and *core competences* (Prahalad & Hamel, 1990). Core competences are the collective learning of an organization on how to coordinate diverse production skills and integrate various technologies to create sustainable and profitable core products (Prahalad & Hamel, 1990). According to this school, the best path to ensure the continuity of the organization is to focus on the unique resources and core competences of the organization.

The *e³forces* modelling technique is grounded on theories supporting the *environmental school* on business strategies. Even though there has been some discussion about organizations in the "New Economy" and how the environment influences these organizations (see Porter, 2001; Tapscott, 2001), there is agreement that an organization has to *position* itself in its environment. According to Porter (1980; 1985) environmental business forces determine that position. Tapscott (2000) however considers the position within a networked value constellation. Still, in both cases organizations depend on suppliers to provide products or services and still depend on buyers to buy products or services. Whether this is within a constellation or in position surrounded by business forces does not matter. Suppliers and buyers, as a result of their position, can still make demands and thereby influence the products and services offered/acquired by an organization.

4 E³FORCES

The *e³forces* modelling technique provides modelling constructs *for representing and analyzing* strategic related concepts, such as "business strategy", "strategic position" and, "business forces". The *e³forces* modelling technique enables practitioners to quantify business forces such that it is possible to *analyze* the "match" between an organization's *strategic position* and its chosen *business strategy*. In addition, the *e³forces* modelling technique provides a clear and compact *graphical overview* of business forces and the organization's strategic position. In an *e³forces* model business forces and their *strength* are explicitly stated and are related to actors (see Fig. 2 for example). These business forces, in this paper limited to *supplier markets* and *buyer markets*, are directly based on Porter's Five Forces framework (Porter, 1980; 1985). The *e³forces* technique uses the following constructs (see also Fig. 3):

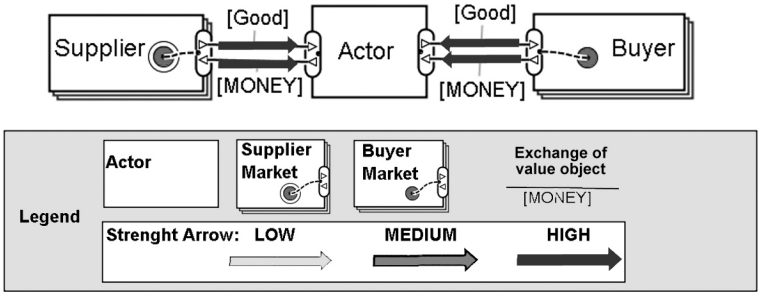

Figure 2. e³forces: an example.

Actor

- Description: Actors are independent economic (and often also legal) entities (Johnson & Scholes, 2002). Actors operate independent or are part of a constellation, which is a *coherent* set of two or more *actors* who cooperate to create value to their environment (Tapscott et al., 2000).
- Properties: An actor has a pre-determined *business strategy*. The business strategy of an organization is the direction and scope of the organization's configuration and position in its environment such that it creates competitive advantage (Porter, 1980; Johnson & Scholes, 2002).

For an organization to successfully execute its business strategy a matching strategic position must be chosen (Porter, 1985). Three generic strategies are considered (Porter, 1980; Johnson & Scholes, 2002): 1) *cost-leadership*, which is trying to offer value objects with similar qualities as competitors but against a lower price; 2) *differentiation*, which is to offer value objects with qualities that are unique or at least differ from competitors; 3) *focus*, which is focusing on a specific (small) buyer market.

- Relationships: An actor, or constellation, *acquires* and *offers* products/services from and to an environment consisting of business forces (Porter, 1985; Johnson & Scholes, 2002).
- Representation: An actor is modeled as a square.

Business Force

- Description: Business forces are those organizations that operate in the *environment* of the actor under study. From a modeling perspective, a business forces is not an independent organization but a *set* of organizations, called a *market*. These external organizations are grouped in *markets* because by considering sets of organizations, we abstract away from the individual and limited influence of many single organizations (Porter, 1985). This abstraction simplifies the *e³forces* models to be made, and suffices for the business forces analysis we conduct. Therefore, we consider relationships between *actors* and specific *markets* in the actor's *environment*, rather than the many relationships between actors and each *individual* organization in the actor's environment.
- Relationship: Business forces *influence* the *price* and/or *configuration* of *products/services* which they acquire from or offer to actors (Porter, 1985; Johnson & Scholes, 2002). They are able to do so because they negotiate different prices, bargain for higher quality, alter specifications or, try to play competitors against each other (Porter, 1980; 1985).
- Properties: A business force has a *strength*. The strength of a force indicates to what extent that specific force can influence the price and/or configuration of a *value object* offered to or acquired from an actor (see Fig. 2) (Porter, 1980;1985).
- Types: In this paper two types of business forces are considered (Porter, 1980): 1) *buyer markets*, to who an actor offers value objects and, 2) *supplier markets*, from who an actor acquires value objects.
- Representation: A business force or market is modeled as a layered square. The strength of a business force is expressed by a "strength" arrow. A strength arrow is graphically bundled with the exchange of a value object and points from the business force toward the actor.
- Example: Dell (the actor) acquires Windows Vista (a value object) from Microsoft (a business force). Microsoft is, due to its monopoly, a strong business force and therefore can easily influence (eg. alter) both price and configuration of Vista.

Strategic Position

- Description: The strategic position of an actor is the environmental context in which the actor operates from a business strategy perspective. The environmental context of an actor is the set of business forces which influence the configuration and/or price of value objects offered/acquired by an actor.
- Relationship: An actor *has* a strategic position. Ideally an actor's strategic position enables it to execute its business strategy (Porter, 1980)

Value object

- Description: Markets and actors in a constellation exchange products and services which are, in generic terms, "*value objects"* (Gordijn & Akkermans, 2001). A value object has economic value for an actor when the actor can use the object to satisfy a need or when the actor can use the object for transfer with another object (Gordijn & Akkermans, 2001).
- Properties: A value object has two attributes (Porter, 1985; Johnson & Scholes, 2002): 1) the *configuration* consisting of the qualities the object offers and, 2) a *price* which is expressed in terms of another value object, wanted in return by the provider of the original value object (the price to be paid is usually money, although not obligatory).

- Relationships: The price and/or configuration of value objects acquired/offered by an actor from buyer and supplier markets are *influenced by* environmental business forces.
- Although the *e³forces* modelling approach shares a few concepts with *e³value* (see Gordijn & Akkermans, 2001), they are *fundamentally different*. The main focus of *e³value* is on economical *feasibility* of constellation, whereas *e³forces'* main focus is on the strategic position of actors in a networked value constellation. However, by sharing some concepts with *e³value, e³forces* and *e³value* can be easily integrated on the software-tooling level.

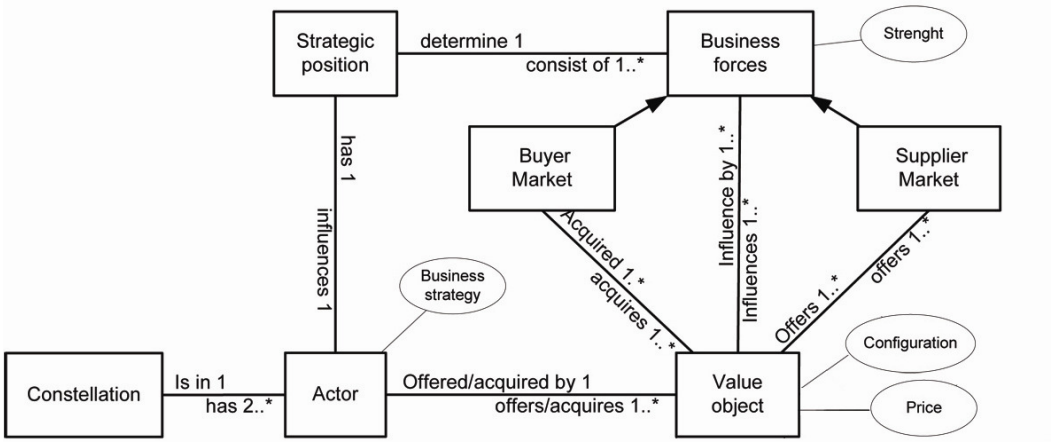

Figure 3. e³forces's modelling constructs.

5 CASE STUDY: MOBZILLI - LOCATION BASED ADVERTISEMENT

For this paper we use the 'Mobzilli' case to demonstrate how we utilize *e³forces* to analyze the match between an organization's business strategy and strategic position. Mobzilli is a starting Dutch Internet company and offers a "mobile location based advertisement"-service. Mobzilli offers merchants the possibility to target customers with (specific) advertisements on their mobile phone, depending on the location of the customer. For over a period of six months we had meetings with the board or Mobzilli. Not only did they provide us with information on Mobzilli, they also provided feedback on the *e³forces* modelling technique (eg. what was clear and practicable for understanding strategic positioning and what was not). Fig. 1 provides the *e³value* model (see Gordijn & Akkermans, 2001) for the Mobzilli case. The *e³value* model was used to understand which buyers and suppliers operate in Mobzilli's environment, and what they exchange of economic value with each other. We will discuss the Mobzilli case more elaborate in the coming sections.

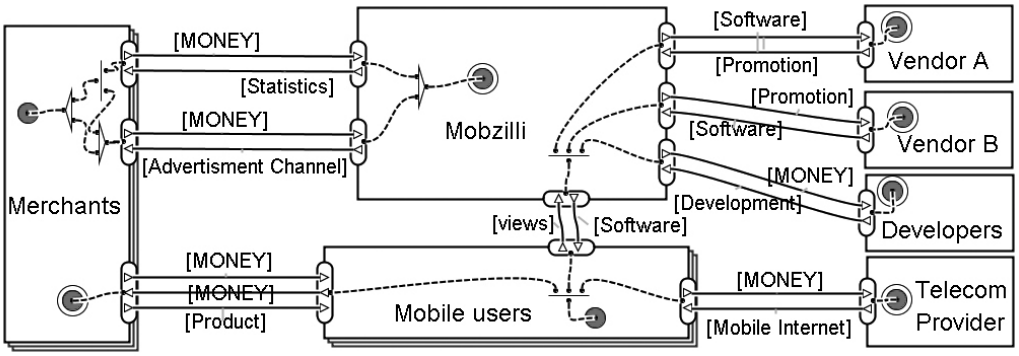

Figure 1. Mobzilli: e³value model.

6 HOW BUYER MARKETS INFLUENCE VALUE OBJECTS

Buyers markets are sets of organizations which are part of the environment of an actor and *acquire* value objects from the actor under study. Buyer markets can influence value objects because they negotiate down prices, bargain for higher quality, desire different specifications and, try to play competitors against each other, all this is at the expense of the profitability of actors in the networked value constellation (Porter, 1980; 1985). Note that we, as described above, do not look at buyers independently, instead we analyze the *buyer market* of which the individual buyer is part. After eliciting buyer markets, the next step is determining the strength of buyer markets. To determine the strength of buyer markets we have developed a metric based on Porter's (1980) original buyer market analysis.

6.1 Metric for analyzing the strength of buyer markets in *e³forces*

To analyze the influence of a buyer market on a value object, seven aspects need to be analyzed. These aspects are directly derived from the Five Force Model (Porter, 1980; 1985). To analyze these aspects we ask *domain experts* the following questions:

- Q1: Is there a concentration of (dominant) buyers? If a few large buyers acquire a vast amount of sales, then they are very important to the actor, which gives them more strength.
- Q2: How many alternative suppliers are available? A buyer market is stronger, if there is a wide range of suppliers from which the buyer market can chose.
- Q3: Are there alternative resources of supply? If the buyer market can chose between many alternative value objects then the buyer market is powerful.
- Q4: Are costs of changing suppliers high? If costs are low, then buyers can easily choose another supplier, which gives the buyer market strength.
- Q5: How important is the value object to the buyer? If the value object is not important to the buyer market, it is harder for actors in the constellation to maintain an economic feasible relationship.
- Q6: Are there low profits for the actors? If the actors in the constellation have to sell large volumes to make profits, it gives the buyer market more bargaining power.
- Q7: Is there a threat that an actor is taken over in the constellation? If a buyer is willing and capable to purchase an actor in the constellation, it threatens the position of that actor.

To be able to measure and compare the strength of buyer markets, each of the questions related to buyer markets - Q1 through Q7 - is scored on a five points scale. The scoring is performed with the aid of *domain experts*. This method of scoring is based on grounded business theories (eg. Balanced Score Cards (Kaplan & Norton, 1992)) and software architecture theories (eg. CBAM (Asundi, Kazman, & Klein, 2001)). The score "5" indicates that the extent to which the buyer market can influence the value object acquired from the actor is high and "1" indicates that it is low. Because the relevance of the aspects can vary per value object exchanged, domain experts give each aspect a *weight factor* (β_j), as done in CBAM (Asundi et al., 2001). The domain expert have to divide 100 points over the 7 aspects ($\sum\beta_j = 100$); more points indicate higher relevance. When the weighted expert scores are summed the "strength" of a buyer market in relationship to the acquired value object is expressed. The strength of a buyer market indicates to what extent the buyer market is able to influence value objects acquired from the actor under study.

$$StrengthBuyer = (\sum_{j}^{7} \beta_j Q_j) / 5$$

The total sum is divided by 5 to range buyer market's strength from a maximum "100" to a minimum of "20". For *visual* purposes a score in the range of "20-48" indicates low strength (light gray arrows), "48-76" indicates medium strength (medium grey arrows) and, "76-100" indicates high strength (dark gray arrows).

As indicated, a value object has two attributes which can be altered: *price* and *configuration* (Porter, 1980). The influence of a buyer market can therefore be on the value object's price or configuration or both. So after determining a buyer market's strength, we must determine whether this influence will be relevant for the value object's price and/or configuration. Commonly the influence of a buyer market will be on both the value object's price *and* configuration, but if an actor for instance *chooses* to offer a value object for free the buyer market will logically not influence the price.

6.2 Visualization of buyer markets in *e³forces*

As mentioned earlier, one of the benefits of the *e³forces* modelling technique is that we can visualize the influence of business forces on actors. In this paper we use *e³forces* to asses and visualize how business forces influence the strategic position of Mobzilli within its networked value constellation. Fig. 4 displays the relationships between Mobzilli and the buyer markets "Merchants" and "Mobile Users" and visualizes the extent to which these two buyer markets influence the value objects offered by Mobzilli. The impact of a buyer market on the price of a value object offered is visualized by a coloured arrow pointing toward the *in*-port - the small triangle pointing toward Mobzilli - of the corresponding value transfer. The impact of a buyer market on the configuration of a value object offered is visualized by a coloured arrow pointing toward the *out*-port - the small triangle pointing away from Mobzilli - of the same value transfer.

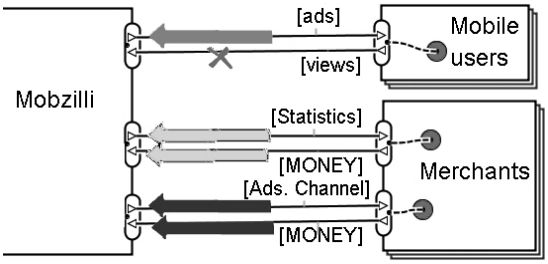

Figure 4. e³forces: Mobzilli's Buyer Markets.

To find the scores of the buyers markets, and to be able to visualize them, we used the board of Mobzilli as domain experts. In collaboration with Mobzilli the seven aspects were weighted and scored, after a few iterations and discussions the final scores were found. To start with the "Mobile Users" buyer market, according to the metric described above the score is "72", indicating that the strength of this buyer market is considered medium. The strength of the buyer market is medium because there is no concentration of buyers (Q1) and few alternatives exist (Q3). The buyer has however *no* influence on the *price* of the service offered by Mobzilli, since both the software and the corresponding service are free. This indicates that "Mobile Users" can only make medium demands about the *configuration* of the service offered by Mobzilli. The buyer market "Merchants" acquires two value objects from Mobzilli: an advertisement channel and optional statistical information on the use of the advertisement channel. To start with the second, if the metric is applied the score is "46", indicating that the extent to which the merchants can influence both the price and configuration of the statistical information offered by Mobzilli is limited. If the metric is applied to the advertisement channel the score is "87", indicating that the strength of the buyer market Merchants for this value exchange is high. This implies that "Merchants" are able to influence both the price and configuration of the service offered by Mobzilli (Porter, 1985).

7 HOW SUPPLIER MARKETS INFLUENCE VALUE OBJECTS

Supplier markets, the second business force, are those organizations which *provide* value objects to actors in the constellation. Suppliers influence value objects provided to actors in a constellation by threatening to alter the configuration of goods/services, to increase the price or to limit availability of

products (Porter, 1985). All this is at the expense of the profitability of the actor in the networked value constellation (Porter, 1980; 1985).

7.1 Metric for analyzing the strength of supplier markets in *e³forces*

We deal with supplier markets in the *same* manner as with buyer markets, yet different aspects need to be analyzed to determine the (possible) impact of a supplier market on the value object provided to an actor (Porter, 1980). Domain experts are asked the following questions to analyze the strength of a supplier market (Porter, 1980; 1985):

- Q1: Is there a concentration of (dominant) suppliers? Suppliers are able to exert more influence if they are with few and when buyers are fragmented.
- Q2: To what extent is the supplied object essential? If the value object is essential then the actors in the constellation can make fewer demands.
- Q3: How important are the actors in the constellation to the suppliers? If actors in the constellation are not the supplier market's main buyer, then the supplier is stronger.
- Q4: Are the costs of changing suppliers high? If the costs are high, then actors in the constellation are less likely to choose another supplier, which give the supplier more strength.
- Q5: Is there a threat of taking over an actor in the constellation? If a supplier plans, and is able, to take over an actor in the constellation it is a threat to the actor.

As was done for the buyer force, the aspects are weighted and scored on a five points scale with "5" indicating high possible impact and "1" indicating low possible impact. As with a buyer's score, a supplier's score is classified as low, medium or high for *visual* purposes. The formula to determine the strength of suppliers is:

$$StrengthSupplier = (\sum_{j}^{5} \beta_j Q_j) / 5$$

7.2 Visualize supplier markets with *e³forces*

Fig. 5 displays the relationships between Mobzilli and the suppliers markets "Locations Software", "Customer Software" and, "Software Developers" and visualizes the extent to which these suppliers markets can influence the value objects provided to Mobzilli. This is done in the same manner as with buyer markets. As with buyer markets; the scores were found in collaboration with Mobzilli.

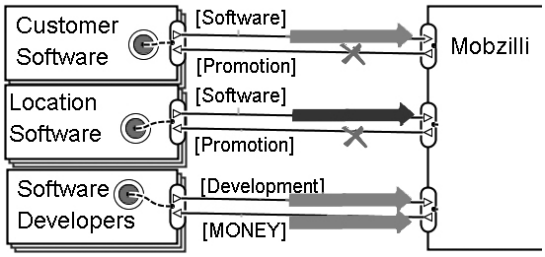

Figure 5. e³forces: Mobzilli's Supplier Markets.

As motivated earlier, the individual suppliers (see Fig. 1) are placed in supplier markets: "Vendor A" is placed in the "Location Software" market, "Vendor B" is placed in the "Customer Software" market and, "Developers" is placed in the "Software Developers" market (see Fig. 5). To start with the supplier market "Location Software", according to the supplier metric the score is "84"; which is considered high. The high score is the mainly the result of a concentration of suppliers (Q1) and the importance of the value object (Q2). Considering that the software is offered for free by multiple organizations, the strength of this supplier market is most visible in the configuration of the software offered. Following the theories of Porter (1985), the "Location Software Developers" supplier market

determines the configuration of the software offered. For Mobzilli the possibilities to demand changes in the configuration of the software acquired are limited. Second the "Customer Software", according to the metric the score for this supplier market is "75", which is just medium. The score for this market is lower then for the previous market because this market is larger (Q1). But again, multiple organizations in this market offer this software for free. Therefore the strength of this supplier market indicates that this market influences the value object's configuration and not price. This again limits the possibilities for Mobzilli to demand changes in the configuration of the software acquired from "Customer Software". Finally "Software Developers", according to the metric the strength of this market is "60"; which is medium. This is mainly due to the fact that Mobzilli can easily choose alternative resources. So, following theory by Porter (1985), both Mobzilli and "Software Developers" can make demands about the price and configuration and negotiation between both organizations is required.

8 IS THERE A CORRECT MATCH BETWEEN STRATEGIC POSITION AND BUSINESS STRATEGY?

A prerequisite for determining the match between Mobzilli's business strategy and strategic positions is that we know Mobzilli's *business strategy*. As stated before, an actor can choose between three business strategies: "cost-leadership", "differentiation" and, "focus". Mobzilli has chosen the business strategy "differentiation", which is to offer a value object with qualities (eg. a configuration) that differ from competitors (how Mobzilli's differs is not relevant for this paper).

If Mobzilli wants to execute their "differentiation" business strategy they should have a strategic position which allows Mobzilli to have "control" over the *configuration* of their value object, but *not* necessarily over the price (Porter, 1980). In terms of business forces this means that Mobzilli should deal with supplier markets and buyer markets which *cannot* influence the configuration of value objects offered and acquired, but are allowed to influence the price of value objects offered and acquired (Porter, 1980).

If we analyze Mobzilli's buyer markets and supplier markets we can see that there are two strong forces: "Merchants" and "Location Software". Furthermore, "Merchants" influences the configuration of the value object "Adv. Channel" acquired from Mobzilli and "Location Software" influences the configuration of the value object "Software" provided to Mobzilli. From a business strategy perspective this does not "match" the chosen business strategy of Mobzilli, since supplier markets and buyer markets should *not* influence the configuration of value objects acquired/offered. It must however be noted that during the research period Mobzilli had not yet chosen a final strategic position. Subsequently, our analysis was used to evaluate their current strategic position and search for other possibilities.

9 LESSONS LEARNED

9.1 The combined impact of buyer markets and supplier markets

During the application of *e³forces* at Mobzilli we observed that value objects offered to buyer markets are dependent on value objects acquired from supplier markets. For instance, the type of "location software" acquired from a vendor determines the set of "Mobile Users" since there are compatibility issues between software platforms and mobile phone brands.

A value object offered to a buyer market is thus not only influenced by the buyer market, but also by supplier markets. The price and configuration of value objects *offered* by an actor is therefore related to the price and configuration of value objects *acquired*. This is supported by the notion that value objects acquired by an actor are commonly used (in part) for value objects offered to buyer markets (Johnson & Scholes, 2002). Therefore, if a (strong) supplier increases the price of a value objects acquired by an actor, the price of a related value object offered to a buyer market is also affected.

Logically, if multiple supplier markets offer value objects, which are used to offer a value object to a buyer market, each supplier market is able to influence the price and/or configuration of the value object offered by the actor to the buyer market.

A useful consequence of our observation is that we could determine the combined impact of supplier markets and buyers markets on a value objects offered by an actor. To that extend we propose to calculate the sum of supplier markets and buyer markets related to a value object offered to a buyer market. We differentiate between the total impact on the value object's price and configuration:

$$TotalImpactPrice = \sum StrengthBuyer_{price} + \sum StrengthSupplier_{price}$$

$$TotalImpactConfiguration = \sum StrengthBuyer_{configuration} + \sum StrengthSupplier_{configuration}$$

We demonstrate this with the aid of the case study. Fig. 6 provides the complete *e³forces* model for Mobzilli; both supplier and buyer markets are modelled. In addition, the *e³forces* model shows the relationships between the supplier markets and buyer markets for the value object "Advertisement Channel" offered to "Merchants". This is expressed with dashed lines and an AND-fork (the vertical line with dots) which connect the value objects acquired from supplier to the value object offered.

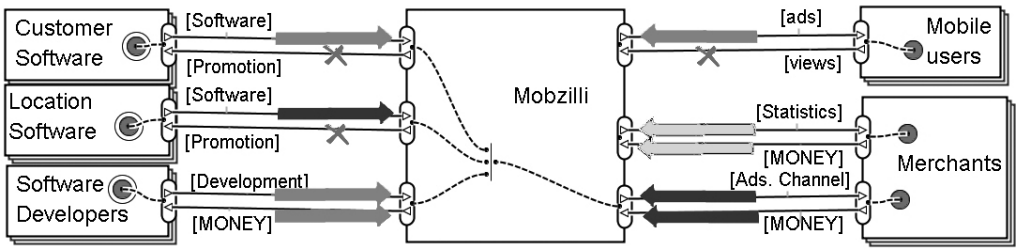

Figure 5. Mobzilli's complete e³forces model

The model shows that all three supplier markets and the 'Merchants" buyer market are related to the value object "Advertisement Channel". If we calculate the total impact of the various forces on this value offering the score are "187" for price and "306" for configuration, both with a maximum possible score of "400".

So the question is, what do these numbers mean and how must we use them? The summed numbers "*TotalImpactPrice"* and *"TotalImpactConfiguration"* indicate the extent to which environmental business forces as a *whole* influence the price and configuration of a *specific* value object offered. In regard to the case study conducted, the numbers imply that for the value object "advertisement channel" Mobzilli should be aware that the environmental business forces as a whole have a strong influence on the configuration of the "Advertisement Channel" offered. Such information is relevant because it gives an indication whether an actor has "control" over the value objects offered. If the environmental business forces as a whole are strong they determine the price and/or configuration of the value object offered. If a business force alters its value object provided (in the case of suppliers) or changes its demands (in the case of buyers) the value object offered by the actor will be influenced (Porter, 1980). For example the "Advertisement Channel" offered by Mobzilli. Mobzilli must make sure that what is acquired from the supplier markets and what is offered to the buyer markets is proper aligned. If either a supplier market or buyer market wants changes in the configuration of value object acquired or offered by Mobzilli, then Mobzilli does *not* have the strength to counteract this. On a strategic level this is a weak point in Mobzilli's strategic position.

10 CONCLUSION

The aim of this paper is to demonstrate how we analyze, via a model based approach, the match between an organization's business strategy and strategic position in a networked value constellation. To that extent we have presented the *e³forces* modelling technique which enables us to quantify the

influence of environmental *business forces* on value objects acquired/offered by an organization in a networked value constellation. This in turn enables us to evaluate the *strategic sustainability* of the products offered by the organization.

We applied the *e³forces* modelling technique to a starting Internet company, which before hand had not considered the relationship between their business strategy and strategic position. Analyzing the influence of their suppliers and buyers showed that their strategic position did not fully match their business strategy. This was the result of a strong buyer market and supplier market present, which influenced the configuration of the value objects offered.

In this paper we have limited ourselves to two distinct business forces, yet more forces are described by Porter (1980): *Competitors*, *New Entrants* and *Substitutions*. These three business forces should be integrated into the *e³forces* modelling technique. The relationship between these forces and an actor however differs from supplier and buyer markets (eg. there is no exchange of value objects) and is therefore prone to future research.

Acknowledgments. The authors wish to thank Wojtek Chowanski and Reza Ladchartabi from Mobzilli for providing case study material and for having many fruitful discussions. This work has been partly sponsored by NWO project COOP 600.065.120.24N16.

References

Asundi, J., Kazman, R., & Klein, M. (2001). Using economic considerations to choose amongst architecture design alternatives (Tech. Rep.). Software Engineering Institute.

Baida, Z., Gordijn, J., Akkermans, H., Saele, H., & Morch, A. (2006). How e-services satisfy customer needs: a software-aided reasoning. In I. Lee (Ed.), E-business innovation and process management (chap. IX). Idea Group.

Barney, J. (1994). The resource-based theory of the firm. Organization Science, 7 (5), 131-136.

Borst, W., Akkermans, J., & Top, J. (1997). Engineering ontologies. International Journal of Human-Computer Studies, 46, 365-406.

Gordijn, J., & Akkermans, H. (2001). E3-value: Design and evaluation of e-business models. IEEE Intelligent Systems, 16 (4), 11-17.

Gordijn, J., & Akkermans, H. (2003). Value based requirements engineering: Exploring innovative e-commerce idea. Requirements Engineering Journal, 8 (2), 114-134.

Hevner, A., March, S., Park, J., & Ram, S. (2004). Design science in information systems research. MIS Quarterly, 28 (1), 75-105.

Johnson, G., & Scholes, K. (2002). Exploring corporate strategy. Edinburgh, UK: Pearson Education Limited.

Kaplan, R., & Norton, D. (1992, Jan-Feb). The balanced scorecard-measures that drive performance. The Journal of Systems and Software, 71-80.

Pijpers, V., & Gordijn, J. (2007). Does your role in a networked value constellation match your business strategy - a model based approach. (Proceedings of the 20th Bled eConference)

Porter, M. (1980). Competetive strategy. techniques for analyzing industries and competitors. New York, NY: The Free Press.

Porter, M. (1985). Competitive advantage. creating and sustaining superior performance. New York, NY: The Free Press.

Porter, M. (2001, March). Strategy and the internet. Harvard Business review, 62-78.

Prahalad, C. K., & Hamel, G. (1990, May/June). The core competence of the organization. Harvard Business Review, 68 (3), 77-93.

Tapscott, D. (2001). Rethinking in strategy in a networked world. Strategy and Business, 24, 1-8

Tapscott, D., Ticoll, D., & Lowy, A. (2000). Digital capital - harnessing the power of business webs. Boston, MA: Harvard Business School Press.

Yu, E. (1995). Models for supporting the redesign of organizational work. In Proceedings of conference on organizational computing systems (p. 226-236). New York, NY: ACM Press.