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Capturing Value from Mobile Business Models: Design Issues That Matter

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Abstract

Designing viable mobile business models that capture value for all organizations involved is challenging. A range of design issues could be considered, and it is often not clear how they ultimately impact the performance of the business model. This paper tests causal relations between design issues and success factors in the organization and finance domain of mobile business models, by analyzing a survey among 120 practitioners and experts in the mobile Internet services domain using structural equation modeling. We find that organizational design issues lead to more acceptable division of roles among actors, and that financial design issues impact more acceptable risks. However, profitability is influenced only indirectly by these design issues, as the relations are mediated through acceptable risks and role division. Our findings imply specific clues to organizations in the mobile domain on what design issues to address in order to satisfy specific success factors.

Keywords: Business models, Mobile services, Success factors

Introduction

Business models for mobile Internet services are only viable in the long run if they capture value for all actors involved. Typically, resources for mobile services are dispersed among operators, content providers, application developers and other players. Their strategic interests should be balanced, and the tangible and intangible value captured from the collaboration should be acceptable for all of them.

In order to capture value from mobile business models, several design issues can be addressed. These include organizational issues like selecting partners and installing governance mechanisms and financial issues like investment planning and revenue sharing models. Existing research lists a range of design issues or parameters for (mobile) business models (e.g., Ballon, 2007, Methlie and Pedersen, 2007, Osterwalder and Pigneur, 2002). Generally, the causal relation between such design issues and the performance of business models has rarely been tested in a large-scale, quantitative approach (Methlie and Pedersen, 2007).

On the other side of the equation, business model performance involves several aspects, and can be broken down into various success factors. For capturing value by the value network offering the service, typical success factors include acceptable division of roles among actors, acceptable

profitability and acceptable risks (Bouwman et al 2008). The performance of a business model can be predicted by evaluating it on such success factors. If a business model fails to satisfy a specific success factor, corresponding design issues should be addressed, i.e. the design issues that significantly impact the score on the success factor. However, existing research has not tested such causal linkages between design issues and success factors.

In this paper, we test the causal relations between design issues and success factors for mobile business models. More specifically, we study the impact of organization and finance design issues on success factors that ultimately explain the value captured by the organizations offering the service. We do so by analyzing the results of a survey among 120 practitioners and experts in the mobile Internet services domain. In a separate paper, we will discuss service and technology design issues and success factors as these mainly impact value created for customers rather than value captured for the value network.

In section 2, we discuss the theoretical background regarding business models. In section 3, we describe the research model and hypotheses, and in section 4 we present the research method and measures to the constructs. Section 5 contains the results of the data analysis based on structural equation modeling. In section 6, we discuss alternative explanations for the results, in section 7 we address the limitations to our research, and in section 8 we present our conclusions.

Background: Business Models

Over the past few years, the field of business models has developed from defining business models, via exploring business model components and classifying business models into categories, towards developing descriptive models (for an overview, see Pateli and Giaglis, 2004). First of all, it is important to consider what a business model is. We agree to a large extent with the definition presented by Chesbrough and Roosenbloom (2002), that a business model is a blueprint for the way a business creates and captures value from new services or products. As such, a business model describes how a company or network of companies aims to make money and create consumer value for a specific service offering (Bouwman, et al., 2008, Haaker, et al., 2006). Central in the business model definition is that a viable business model should create both customer value and network value. In this paper, we focus on the latter.

There are several basic components that constitute a business model. Many researchers (Afuah and Tucci, 2003, Bagchi and Tulskie, 2000, Klueber, 2000, McGann and Lyytinen, 2002, Tapscott, et al., 2000, Timmers, 2000, Weill and Vitale, 2001) focus on business model elements, such as service and product innovation, the actors involved, the relationships between the actors, information and application architectures, and information and value exchange. Alt & Zimmermann (2001) suggest a few common elements that emerge in business model definitions: mission (i.e. overall vision, strategic objectives and value proposition, as well as the basic features of a product or service), structure (i.e. the actors involved and the roles they play within a specific business environment, the specific market segments, customers and products), process (i.e. the concrete translation of the mission and the structure of the business model into more operational terms) and revenues (i.e. the investments needed in the medium and long term, cost structures, and the revenues that are generated). Afuah and Tucci (2003) see business models as a system of components (customer value, scope, pricing, revenue sources, connected activities, implementation, capabilities and sustainability) and relationships between these components. Osterwalder & Pigneur (2002) are far more systematic in their approach to the concept of business models. Based on the questions what a company has to offer, who it targets, how the proposition can be realized and how much can be earned, they discuss four basic elements: (1) product innovation, i.e. the value proposition, the target customer, and the capabilities needed to offer the value; (2) customer relationship, i.e. the information strategy, delivery channels, and trust and loyalty; (3) infrastructure management, i.e. the activity configuration of the company and its partner network and resources; and (4) financials, i.e. the revenue model, cost model, and profit model. In a literature meta-study, Morris et al (2005) have identified 24 different business model components, the ones of which most commonly mentioned being the value offering, economic model, customer interface / relationship, partner network / roles, internal infrastructure / connected

activities, and target markets. In a similar study, Shafer et al (2005) have identified 42 different business model components that can be clustered into four generic components, i.e. strategic choices, value network, value creation and value capturing.

When we compare the various business model definitions, some common components can be distinguished (Bouwman, et al., 2008):

- Service component: a description of the value proposition (added value of a service offering) and the market segment at which the offering is aimed;
- Technology component: a description of the technical functionality required to realize the service offering;
- Organization component: a description of the structure of the multi-actor value network required to create and distribute the service offering and to describe the focal firm's position within this value network;
- Finance component: a description of the way a value network intends to generate revenues from a particular service offering and of the way risks, investments and revenues are divided among the various actors in a value network.

In this paper we focus on the latter two components, i.e. organization and finance, as we expect these domains to be most important in explaining value captured by the network of organizations offering the service.

Research Model

Design Issues

Creating value for business actors (network value) is complex due to the conflicting strategic interests of partner organizations. Actors often originate from different industries (e.g. network operators, financial institutions, and retailers), each with their own strategic interests (e.g. generate traffic, extend services to customers, generate transactions). Design choices in the organization and finance domain may serve the strategic interests of the involved actors.

Knowledge on how to effectively balance requirements and strategic interests within and between the different domains is largely missing in the business model literature (Hedman and Kalling, 2003, Seddon and Lewis, 2003). To develop insight into how organizations can design 'balanced' business models, designers need to understand the *design issues* in business models and their interdependencies. A design issue is defined as a variable that is perceived to be (by practitioner and/or researcher) of eminent importance to the viability and sustainability of the studied business model, and can be considered to be an artifact that can be manipulated by the same practitioner and/or researcher.

We derive design issues from Bouwman et al (2008), and complement them with additional design issues. In the organizational domain, we consider the following issues. *Partner selection* is important to acquire access to resources and capabilities needed to realize a service offering. *Network openness* indicates the degree to which new business actors can join the value network and are allowed to provide services to customers, according to other partners within the network. Generally, two different organizational arrangements exist: the closed model in which a relatively fixed consortium of partners collaborate, and the walled garden model in which new partners are able to join the value network if they comply to certain rules. *Orchestration of activities* is relevant as there is often a dominant actor with access to the customers and end-users or the one that developed the service offering. These business actors often approach and select collaboration partners, set the rules for collaboration (organizational arrangements), and monitor the compliance with these rules. As such, *managing relations with partners* is related to this issue. Finally, *outsourcing* certain activities or performing them in-house is a design issue in the organizational domain.

In the finance domain, we consider the following design issues. For adoption and actual usage of a service the perceived customer value must at least balance but preferably exceed the *pricing* of a service. As developing and introducing a new service involves financial risks, *division of investments* is another design issue. *Division of costs and revenues* may follow different logics, e.g. cost based or value based. For fair and viable revenue sharing arrangements, *valuing the contributions and benefits* of each partner to the service offering is important, e.g. based on actors' access to resources and strategic interests. Finally, *investment planning over time* is relevant as it impacts the risks and costs involved in the service offering.

Success Factors

As a definition, success factors refer to "the limited number of areas in which satisfactory results will ensure that the business model creates value for the business network" (adapted from Rockart and Bullen, 1981). In the business network firms will, on the one hand, cooperate to create value based upon common interests and, on the other hand, compete to capture value based upon individual interests (Brandenburger and Nalebuff, 1997). Where some authors emphasize competition such as Porter's five forces model (Porter, 1985), others emphasize cooperation, such as industrial marketing and purchasing (e.g., Axelsson and Easton, 1992). Success factors for network value relate to balancing these forces in the finance and organization domains resulting in acceptable outcomes for the participating firms, in particular those firms that provide essential resources and capabilities.

Because financial incentives are important for the participation of firms in new business initiatives, the profitability and risks for the firms in the business network are critical success factors. The experiences with respect to electronic business has taught us that paying too little attention to 'the bottom line' results in the failure of new business initiatives (Holland, et al., 2001). An *acceptable profitability* should be acceptable in an absolute sense, that is a positive financial result fitting with companies' risk/return profile, and a relative sense, that is compared to the financial results of the other participating firms. Financial design issues such as *division of costs and revenues* and *pricing* should result in an acceptable profitability.

Acceptable risks are a critical success factor for mobile initiatives because of the high uncertainty with respect to market acceptance and technology choices. Financial design issues such as *division of investments* and *division of costs and revenues* should result in acceptable financial risks.

However, financial factors are not the only kind of critical success factors that are required for network value. Also organizational factors need to be taken into consideration. An *acceptable division of roles* refers to the distribution of roles over firms and integration of roles within firms that participate in the business network. Kambil and Short (1994) already drew attention to the importance of roles and their linkages for the functioning of business networks. This is also related to the organizational design issues as *outsourcing* and *partner selection*. Concluding, the success factors for network value are 'acceptable profitability,' 'acceptable risks,' and 'acceptable division of roles'. It is assumed that high scores on these success factors will result in a 'win-win' situation, in which each actor has incentives to participate, i.e. a business model that generates network value. It can be expected that a service that generates network value can result in a viable business model in the long run.

Conceptual Model

The conceptual model below summarizes the propositions in this section. The design issues in the organization domain are instrumental for dividing value activities and roles over multiple actors and aligning their resources, capabilities and strategic interests.

H1 Addressing organizational design issues leads to more acceptable division of roles

Similarly, the design issues in the finance domain are instrumental in defining financial arrangements that lead to a profitable business with acceptable risks for all involved.

- H2 Addressing financial design issues leads to more acceptable profitability
- H3 Addressing financial design issues leads to more acceptable risks

We do not expect that critical success factors will be independent. Acceptable division of roles will lead to more acceptable risks as risks are often related to different roles actors fulfill, i.e. actors with experience with a specific role are more likely to have a clear idea and a better assessment of potential complications and hazards. And acceptable risks will lead to acceptable profitability in the end.

- H4 More acceptable division of roles leads to more acceptable risks
- H5 More acceptable risks lead to more acceptable profitability

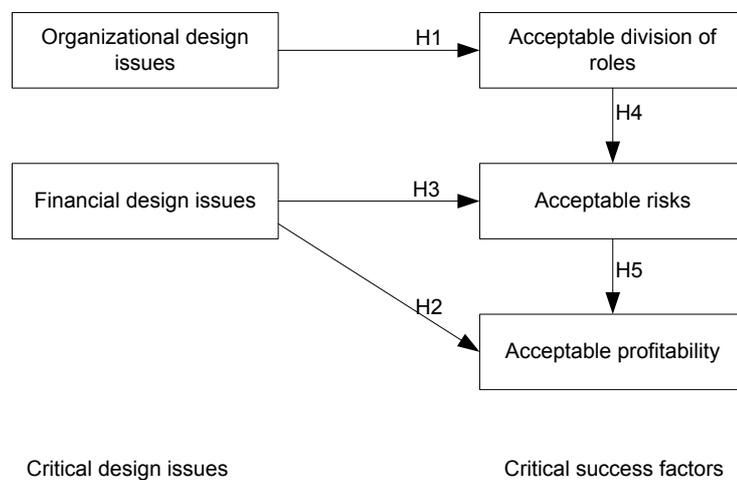


Figure 1: Conceptual model

Method

Sample

We collected the data through an online questionnaire between September and November 2007. To place the questions into their proper context, we asked the respondents to focus on their most important service offering. Academic respondents were asked to focus on the most familiar service offering and adopt the point of view of the organization with which they were most familiar. Finding respondents for this type of survey is a challenge, keeping in mind that there is no database with all the relevant players in the mobile services industry. Respondents were recruited using the social network of the researchers and their colleagues (46 respondents), social networking websites (10), mobile-related news magazines (1) and business presentations on the Internet (6). In addition, sixteen academic experts were recruited via conference papers and journal articles on mobile business models and related topics. Respondents were also asked if they knew any other potential targets in their relational network, which added another 26 respondents to our sample. Fifteen anonymous respondents were recruited by a Dutch sector organization for mobile content providers.

In total, 521 invitations were sent out, to which 137 people responded. The reasons provided for not taking part in the survey were lack of time, lack of expertise to answer the questions and no interest in the study. A specific group of non-respondents consisted of hardware providers and

network manufacturers, who commented that they did not feel involved in mobile services, but only in technology platforms. Several academics also turned down our invitation, predominantly because they felt they had insufficient expertise to answer the detailed survey questions. To control for non-response bias, we compared the answers given by early and late respondents, and found no significant differences. Of the 137 respondents, 17 were removed, because they provided incomplete answers.

The final sample contained 120 respondents, of whom 77 % came from industry, and 23 % consisted of academic and consultancy experts. Although the survey targeted an international audience, most respondents are from the Netherlands (53). Other regions included in the sample are Scandinavia (17), Germany (7), USA (8), Austria (7), UK (6), Italy (6), France (3), Latin-America (2), Australia (1), South-Africa (1) and other European countries (7). Our sample represents a wide variety of 'most important services', including advertising, banking, blogging, communication, e-mail, entertainment, adult services, games, health, Internet, location-based services, news, office, portal, radio, sports information, streaming, surveys, transport information, TV, user-generated content, weather information and workforce management. Of the total number of respondents, 30 adopted the point of view of a (virtual) network operator, 20 that of an application/software provider, 25 that of a consultancy firm, 28 that of a content/service provider, publisher or content aggregator, and only 3 that of a hardware/equipment manufacturer.

The organizations in our sample interact on a day-to-day basis with no (29%), one (19%), two (21%), three (14%), four (4%), five (4%) or even more (9%) organizations.

Measures

We used three to six indicators per construct in the conceptual model. According to Martin and Larsen (1999), success factors can be measured by letting respondents rate the importance and difficulties of reaching underlying objectives. Respondents were presented with the list of objectives in Table 1, and were asked to rate the importance regarding their service offering, on a Likert 7-point scale (Totally unimportant – Utmost important). We developed these indicators ourselves and pretested them in a survey among 30 respondents, in which they were found to cluster as expected in an exploratory factor analysis.

Table 1: Measures for Critical success factors

| Item | Please indicate the importance of the following objectives to the service offering: |
|----------|---|
| Prof_1 | Obtaining sufficient revenues for my company |
| Prof_2 | Obtaining sufficient revenues for business partners |
| Prof_3* | Obtaining a dominant position |
| Risks_1 | Controlling risks |
| Risks_2 | Keeping risks at an acceptable level |
| Risks_3* | Sharing risks with partners |
| Risks_4* | Taking risks to lead trends |
| Roles_1* | A clear division of roles and responsibilities |
| Roles_2* | Ensuring our company can fulfill the role it wants to fulfill |
| Roles_3 | Agreeing with partners on the division of roles |
| Roles_4 | Agreeing with partners regarding who coordinates the activities |

** Removed from final model*

To measure the design issues, respondents were presented with the list of issues in Table 2, and were asked to rate the extent to which they had taken them into account, on a Likert 7-point scale (Not at all – Great extent). The indicators are identical to the design issues discussed in section 3.1.

Table 2: Measures for Critical design issues

| | |
|--------|--|
| Item | Please indicate to what extent the following issues have been considered in the design of the service. |
| Org_1 | Partner selection |
| Org_2 | Openness towards new partners |
| Org_3* | Orchestration of activities |
| Org_4 | Managing relations with partners |
| Org_5* | Outsourcing |
| Fin_1* | Pricing |
| Fin_2 | Division of investments |
| Fin_3 | Division of costs and revenues |
| Fin_4* | Valuing contributions and benefits of partners |
| Fin_5* | Investment planning over time |

* *Removed from final model*

In order to refine the measures, we conducted a confirmatory factor analysis (CFA) using Amos 7.0. From the five-factor model, we subsequently removed items that load on multiple latent variables as advised by Anderson and Gerbing (1988), based on standardized residuals and Modification Indices (MI). While refining the measurement model, we used an imputed dataset using expectation maximization in SPSS 15.0.

Table 3: Refining the measurement model

| Item removed | χ^2 | df | p-value |
|---------------|----------|-----|---------|
| Initial model | 412.8 | 180 | .000 |
| Fin_4 | 351.5 | 161 | .000 |
| Risks_3 | 300.8 | 143 | .000 |
| Org_5 | 263.8 | 126 | .000 |
| Roles_1 | 207.0 | 109 | .000 |
| Fin_1 | 169.9 | 94 | .000 |
| Fin_5 | 152.1 | 80 | .000 |
| Org_3 | 109.7 | 67 | .001 |
| Roles_2 | 90.3 | 55 | .002 |
| Prof_3 | 48.4 | 44 | .301 |
| Risks_4 | 39.0 | 34 | .255 |

We retain this measurement model. Seven observations were removed with high departures from normality, based on Mahalanobis d-squared ($p < .001$). We refit the measurement model with the original data using FIML, and find acceptable model fit: $\chi^2(35) = 40.703$, $p = .234$; CFI = .992; TLI = .984; RMSEA = .038. To solve a Heywood case, the variance of the error term to Roles_3 was constrained to 0.005 (Bagozzi and Yi, 1988).

Convergent validity is acceptable as all factor loadings for each individual indicator in its respective construct are statistically significant ($p < .001$) and standardized regression weights exceed .5. In addition, for all latent variables we find average variance extracted exceeding the .5 benchmark (Fornell and Larcker, 1981). Construct reliability is acceptable as composite reliability exceeds the .6 benchmark (Hair, et al., 2006).

Discriminant validity is acceptable, as we find the square of two constructs' correlation to be smaller than the average variance extracted estimates of the two constructs (Fornell and Larcker, 1981).

Table 4: Convergent and discriminant validity of measurement model

| Construct | Item | Std. factor loading | Variance extracted | Composite reliability |
|-----------|---------|---------------------|--------------------|-----------------------|
| Prof | Prof_1 | .80 | .60 | .61 |
| | Prof_2 | .74 | | |
| Risks | Risks_1 | .85 | .78 | .82 |
| | Risks_2 | .92 | | |
| Roles | Roles_3 | 1.00 | .87 | .88 |
| | Roles_4 | .86 | | |
| Org | Org_1 | .83 | .65 | .73 |
| | Org_2 | .77 | | |
| | Org_4 | .82 | | |
| Fin | Fin_2 | .94 | .85 | .86 |
| | Fin_3 | .90 | | |

Results

We apply Structural Regression modeling using Amos 7.0 to test the conceptual model from Section 3.3. The *a priori* model from Section 3.3 has an acceptable fit ($\chi^2(38)=49.213$, $p=.105$; CFI=.983; TLI=.971; RMSEA=.051). To obtain a parsimonious model, we remove the non-significant path from financial design issues to acceptable profitability. Residuals and modification indices do not suggest additional paths between the endogenous variables in the model. The final model has acceptable fit ($\chi^2(39)=49.617$, $p=.119$; CFI=.984; TLI=.973; RMSEA=.049). Explained variance of the endogenous constructs is reasonable. See below for the model, from which the measurement part and errors are omitted for sake of clarity.

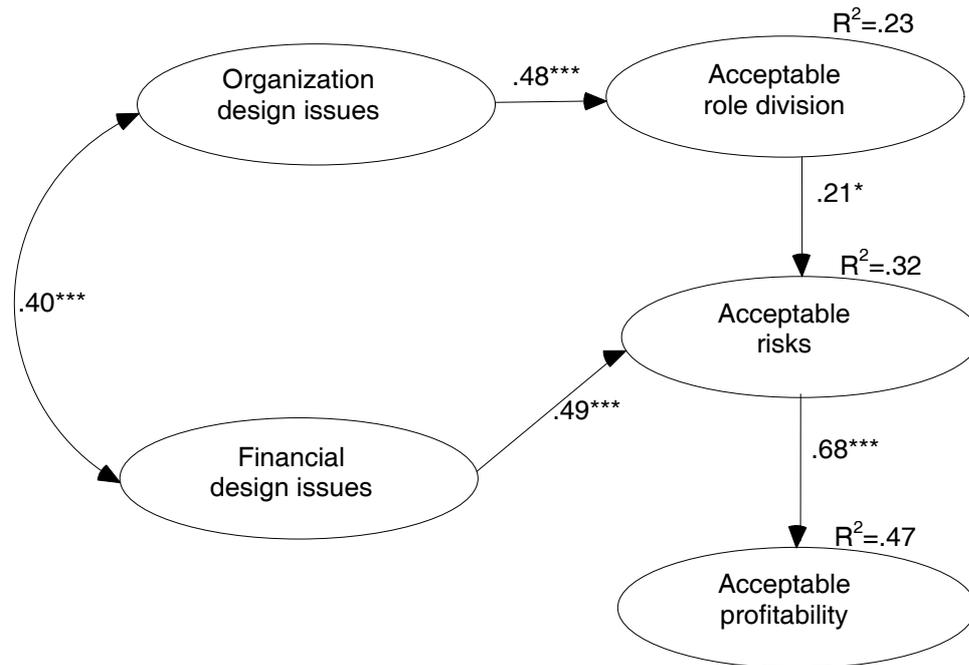


Figure 2: Structural model (Measurement model and error terms omitted)
 * $p < .05$; ** $p < .01$; *** $p < .001$

We fixed the estimates of the errors to the endogenous constructs, and one of the loadings for each latent variable. In terms of normality, critical ratio for skewness and kurtosis was found acceptable for most variables. Non-parametric bootstrapping indicates a robust overall model fit, as the p-value for the Bollin-Stinen statistic equals .215. Bias-corrected 95% confidence intervals indicate that most coefficients in the model are robust.

We find that our hypotheses are generally accepted. Indeed, organizational design issues impact acceptable role division (H1). However, financial design issues do not directly impact acceptable profitability, although there is an indirect effect of .33 mediated by acceptable risks (H2). Financial design issues do directly impact acceptable risks (H3). We find support that the success factors are related, as acceptable role division leads to acceptable risks (H4), which in turn affects acceptable profitability (H5).

Limitations

The assumption underlying our study is that business model performance can be predicted by the success factors. The study could be extended by adding measures on profits and intangible benefits from offering the service to the model. In addition, more attention has to be paid to the role of critical design issues in the service (e.g., branding, targeting, customer retention) and technology domain (e.g., system integration, security, user profiling), and success factors explaining customer value (e.g., compelling value proposition, clear target group, acceptable quality of service delivery). However, some first analyses show that design issues and success factors in these two domains are very closely related.

Success factors were measured by asking respondents to rate the importance of underlying objectives. While this is common practice in studying success factors (Martin and Larsen, 1999), it could be extended by including measures on whether the objectives were actually met.

Conclusions

The main conclusion of this paper is that design issues in business model components can indeed be related to success factors that explain value captured by the organizations offering mobile services. We find that organization design issues lead to a more acceptable role division among actors. And that finance design issues lead to acceptable risks. However, profitability is influenced only indirectly by these design issues, as the relations are mediated through acceptable risks and role division.

Our results show that the world of mobile service providers appears to be much simpler than we assumed. Basically two success factors appear to be relevant in explaining value captured by service providers: what risks are involved and the division of roles (i.e. who is doing what in the value web). For a large part this confirms discussions with regard to the evolution of value chains towards value webs. In this changing environment the roles that different actors take, and will take in the future, are not established yet. Actors in the value web have to understand who is going to contribute what kind of resources and capabilities, but also who is going to be the provider of specific generic services like authentication, billing, customer care or service management. We expect that in the near future clashes between different visions about who is going to take what kinds of roles will become more relevant. Content and service providers want to control access to their customers, and not leave it to the network operators. We expect that research in this area will become more relevant.

These results are usable in evaluating and refining designed or existing business models. Researchers or practitioners can evaluate business models according to the three success factors. In case a success factor is insufficiently addressed, the results provide clues for the design issues that should be addressed in improving business model performance. As a result, our findings are usable to streamline and focus approaches towards business model design.

The empirical results in this paper also strengthen our confidence in the concepts of design issues and success factors. While conducting a rigorous confirmatory factor analysis, we found support for the dimensionality of both the two business model components studied (i.e. organization and finance) and the success factors (i.e. acceptable profitability, risks and role division). This indicates the relevance and applicability of these concepts.

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