

An engineering approach to business model experimentation—an online investment research startup case study

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ABSTRACT

Every organization needs a viable business model. Strikingly, most of current literature is focused on business model design, whereas there is almost no attention for business model validation and implementation and related business model experimentation. The goal of the research as described in this paper is to develop a business model engineering tool for supporting business model management as a continuous design, validation and implementation cycle. The tool is applied to an online investment research startup in roll out and market phase. This paper describes the research as performed in a case study setting by focusing on the design, implementation and evaluation of the business model engineering tool. We also analyze the actual implementation and usage of the business model tool by the online investment research startup by focusing on the most critical actions related to actual business model implementation – i.e. actions with so-called ‘Lollapalooza tendencies’.

Keywords

Business models, action design research, business model engineering, business model dynamics, business model experimentation, business model management, business model innovation, growth & deployment strategies, Lollapalooza tendencies, Internet services, service innovation, entrepreneurship, startups.

INTRODUCTION

With increasing marketplace dynamics, shorter time-to-market cycles and rapid technological developments, the ability to imagine and combine different, formerly separated, technological capabilities in order to facilitate new and useful value propositions for users and customers will be critical (Kijl et al. 2005). To be able to offer these value propositions with new Internet services in a sustainable manner, new viable business models need to be developed (Bouwman et al. 2008; Haaker et al. 2007; Haaker et al. 2006) – in the end, every service needs a viable business model.

The business model concept supports simulating, analyzing and understanding current or new business concepts as well as exploiting them (Osterwalder and Pigneur 2002a; Osterwalder and Pigneur 2009).

Although there are many publications on business models, most researchers consider business models as a static concepts and describe them mostly qualitatively (Kijl et al. 2005). However, in practice, business models constantly (need to) change and thus need to be managed actively, e.g. because of changing market or technological environments (Bouwman et al. 2008; Kijl et al. 2005) and they can be described quantitatively as well (Kijl and Nieuwenhuis 2010; Tennent and Friend 2005). With this research we strive for finding a way to monitor and manage a business model in a more structured, pro-active as well as quantitative way.

By making use of a business model engineering tool, business models could be managed more actively, which may lead to lower failure rates of new businesses or technologies (Mason and Rohner 2002). This is because the real strength of an organization may be strongly related to the quality of its underlying business model. In the end, a mediocre technology exploited with a great business model may be more valuable than a great technology pursued via a mediocre business model (Chesbrough).

RESEARCH OBJECTIVE AND CASE DESCRIPTION

The objective of this business model engineering case study with action design characteristics (Cole et al. 2005; Sein et al. 2010) was to build a business model engineering tool for an online investment research boutique, which evaluates investment opportunities related to investing in shares of companies listed on stock markets and sells related analyses to their clients. The boutique uses a so called freemium business model: it offers free information services to their readers as well as premium, paid information services to a subset of their readers (Anderson 2009; Osterwalder and Pigneur 2009). The company offers all people who subscribed to their mailing list via their website a free weekly investing column. Paying members also get a monthly analysis of three stocks that look interesting from a value investing perspective – these stocks have to be cheap and the companies behind them have to be sustainably profitable (Graham 2003). Essentially, the research boutique can be seen as an information service provider with a scalable business model that completely digitized and automated all information distribution by making use of online mailing systems, online membership and information protection systems as well as online payment systems.

Key driver of the business model concept has been the emergence of the commercial Internet which enabled ubiquitous communications and cheaper ways to convey vastly more rich amounts of information as well as making it possible for businesses to do things they simply never could before (McGrath). These characteristics make information services with scalable business models like that of the investment research company as described above ideally suited for business model experimentation.

The investment research company designed and implemented its business model by making use of the so-called STOF-framework – a common business model analysis framework (see also Section ‘What is a business model?’). Since the company moved from R&D and roll out to the market phase and is profitable, its business model can be considered as viable. But the company didn’t have the ability to test and experiment with its business model in different market scenarios.

Main aim of business model engineering tool is to help the founders of the investment research boutique to engineer (monitor, test, adapt and fine tune) their business model in order to discover strengths, weaknesses, opportunities and threats and to optimally capitalizing on one of their most important assets: their mailing list with thousands of investors. It is expected that the results from the engineering process could be used to find areas and actions for business model improvements. Furthermore, we expect that that the tool could also be used to predict sales and profit levels in different market scenarios.

RESEARCH APPROACH

An action design research approach (Cole et al. 2005; Sein et al. 2010) with iterative (problem identification, intervention, evaluation and reflection) cycles was used for developing the business model engineering tool, based on qualitative as well as quantitative analysis. Information from expert interviews, literature studies and quantitative modeling were combined in order to develop the business model engineering tool. After initial development, the tool was refined and improved in three design cycles based on expert interviews. The following iterative steps were used:

- Analyze the current – already viable – business model: The business model in use by the investment research company needs to be analyzed and the underlying logic needs to be clear.
- Build the engineering tool: In this step the business model engineering tool has to be built, by using the already viable and implemented business model design of the investment research company as analyzed in the previous steps as a basis.
- Analyze output: The output from the engineering tool could be used for adapting and fine tuning the business model of the investment research company, i.e. by discovering strengths and weaknesses as well as recognizing potential threats and finding new opportunities for growth.

After describing the results of a concise business model literature study in the next section, the development of the business model engineering research will be described, following the three steps as mentioned above. Subsequently, we will focus on concisely analyzing and evaluating the actual usage and implementation of the approach by the investment research start up.

BUSINESS MODEL LITERATURE REVIEW

Because the business model concept plays a critical role in developing a business model engineering tool, we need a clear understanding of this concept.

What is a business model?

Essentially, a business model describes the logic behind value creation (Bouwman et al. 2008; Kijl et al. 2005). A widely used business model definition within this context is the definition by Rosenbloom and Chesbrough (2002): “A business model is a blueprint for how a network of organizations co-operates in creating and capturing value from technological innovation”.

Initially, most attention has been paid to empirically defining and classifying business models (Hedman and Kalling 2003; Timmers 1998). More recently, literature focused more strongly on business model design and defining business model components (Bouwman et al. 2008; Kijl et al. 2005; Osterwalder et al. 2005; Pateli and Giaglis 2004).

A business model can be seen as a description of the manner by which an organization delivers value to customers, entices them to pay for value and converts those payments to profit (Teece). Afuah and Tucci (2000) describe business models as systems that are built from different components, such as value, revenue, sources and capabilities. They state that a business model is geared toward total value creation for all parties involved (Zott and Amit).

Osterwalder and Pigneur (2002b) define four fundamental business model components: product innovation, customer management, infrastructure management and financial management. These four

components are used to group all their subcomponents. Later, Osterwalder and Pigneur further specified these four components into the following nine components (2009): value proposition, customer relationship, distribution channel, target customer, core capabilities, partner network, value configuration and cost structure and revenue streams.

For this research, we use the so-called STOF-framework (Bouwman et al. 2008; Kijl et al. 2005). Though it has other components, it covers the same areas as the model of Osterwalder and Pigneur (2002b; 2009). The STOF-framework uses four different domains or business model components to describe the underlying logic of business model designs (see also Figure 1). Each domain has the generation of value for customers and end users as well as the other roles (mostly organizations) participating in the value network as a key point. The business model components are:

- Service (a description of the service concept an organization or group of organizations offers, its value proposition and the market segments that are targeted)
- Technology (a description of technical architecture, service platforms, devices, applications)
- Organization (a description of actors, roles, interactions, strategies and goals, value activities)
- Finance (a description of investment sources, cost sources, revenue sources, risk sources, pricing)

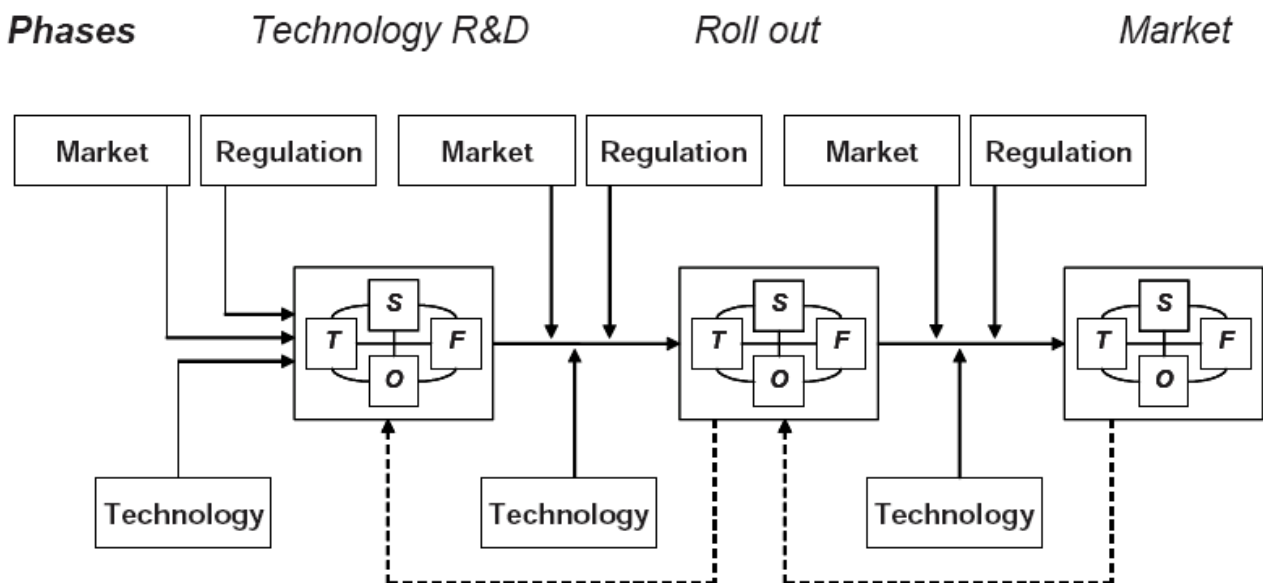


Figure 1 The dynamic STOF-framework from Bouwman et al [3]

Business models are dynamic

While most business model literature has a static and qualitative nature, early stage business model development and validation of business model designs is mostly lacking in literature as well as practice (Kijl et al. 2005). Because of continuously changing market, technology and regulatory environments, most business models have to change as well and can therefore be seen as dynamic concepts (Bouwman et al. 2008). This is also depicted in Figure 1. Sustainable business models, according Morris et al. (2005), have a consistent fit between external factors and the configuration of key activities. Also Porter (2001) related business models to market structures and how companies fit into these structures.

Business model design may take place in market phase, but also in the roll out as well as the technology/R&D phases of a product or service offering – it can be seen as an iterative process (Mason and Rohner 2002; Tennent and Friend 2005) – see also Figure 1. Actually, focusing on business model design only in implementation or market phase is very risky and costly (Mason and Rohner 2002). Not managing the business model at all may be even more risky and costly (Tennent and Friend 2005), and may lead to flawed business models.

In the next sections, the three steps as discussed in research approach section will form the basis for creating a business model engineering tool. Since the second step, the actual development of the business model engineering tool, is the most critical one in this context, the three steps are further specified into a seven step approach. This approach is depicted in Figure 2, and contains the following steps: 1) analyzing the (already existing) viable business model and obtain the related variables, 2) developing an analysis cockpit, 3) designing business model performance indicators and related calculations, 4) adding scenarios, 5) quantifying the scenarios, 6) generating the output from the business model engineering tool in the form of business model performance indicator calculations and 7) interpreting the model output and improving and fine tuning the business model. After the last step, the engineering cycle can start all over again. Each of these seven steps will be concisely discussed in the next sections.

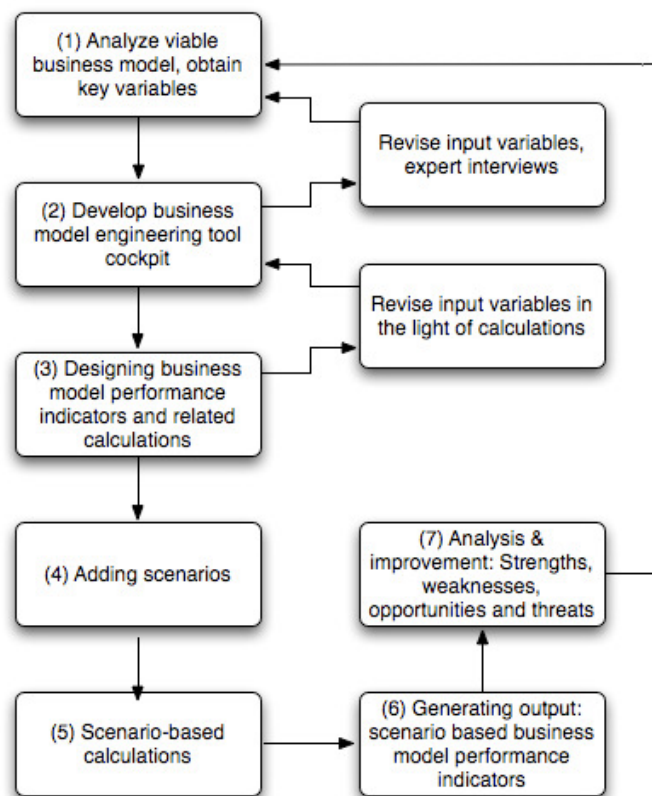


Figure 2 A seven step approach to business model engineering

STEP 1) DEFINING BUSINESS MODEL VARIABLES

The first step in developing a business model engineering tool for the investment research company was to find the most important underlying variables like mailing list size, sales prices and technology costs related to the business model design of the company by making use of the components of the STOF-framework (Bouwman et al. 2008; Kijl et al. 2005). In this case study, all variables were identified via expert interviews with one of the founders of the online investment research boutique. The STOF-framework from Bouwman et al. (2008) was used as a checklist and for grouping the variables. The variables were divided into the four components of the STOF-framework and with ‘market environment’ as most relevant external component. The other two external components as identified in the STOF-framework, the regulatory and technological environment, were not modeled because of their lower expected influence on the business model of the company as well as because they are relatively difficult to quantitatively model and define in terms of variables.

For the Service component, variables like mailing list size and amount of subscribers for the premium services were identified and for the Technology component the variables webhosting costs and payment processing costs. For the Organization domain, we identified variables like traveling costs, subscriptions costs of investment analysis services and marketing costs. In the Finance domain, subscription prices were identified as variables, next to some tax related variables. For the most critical external component, Market environment, market sentiment, amount of investors and economic growth were identified as main variables – when e.g. the market sentiment is good, the amount of subscriptions is expected to increase and vice versa. An overview of the main variables can be found in Table 1.

Once the variables are defined, we can start with step 2.

Table 1 Main variables derived from the business model of the online investment research boutique

Service	Technology	Organization	Financial	Market Environment
Size mailinglist	Inventory	Number of FTE	Service_1 Yearly Price	Market sentiment
Subscriptions Service_1 Yearly	Webhosting	Salary	Service_1 Quarterly Price	No. investors
Subscriptions Service_1 Quarterly	Payment_system 1	Traveling cost	Service_1 Monthly Price	Eco. growth
Subscriptions Service_1 Monthly	Payment_system 2	Subscriptions	Service_2 Yearly Price	
Subscriptions Service_2 Yearly		Marketing	Service_2 Quarterly Price	
Subscriptions Service_2 Quarterly			Service_2 Monthly Price	

Service	Technology	Organization	Financial	Market Environment
Subscriptions Service_2 Monthly			VAT	
Subscriptions Service_3			Tax on income	

STEP 2) DEVELOPING A COCKPIT

The variables as identified in the first step need to be implemented in the business model engineering tool. For this research, the engineering tool was built in Microsoft Office Excel – a popular spreadsheet application.

According to Tennent and Friend (2005), an effective way for showing the most important variables, is to use one sheet exclusively for these variables. This sheet will be called the cockpit. The variables can be shown in exactly the same way as they are found, using the business model components from the dynamic STOF-framework.

Since the main aim of the business model engineering tool is to monitor, test, adapt and fine tune the business model, a performance calculation over several – in this case five – years has to be made. Therefore, a starting year can be added to the cockpit. Figure 3 depicts the components of the business model and all related main variables, based on an expert interview with one of the founders of the online investment research boutique (next to the main variables as described in the previous step, some investment portfolio variables were added as well). During this interview, the variables were checked and the cockpit was checked for completeness as well.

Project name					
Starting year	2010				
Scenario	2	1	2	3	4 See: Scenario
					Standards
Service					
Size Mailinglist					
Growth Mailinglist					
Subscriptions Service_1 Yearly					
Subscriptions Service_1 Quarterly					
Subscriptions Service_1 Monthly					
Subscriptions Service_2 Yearly					
Subscriptions Service_2 Quarterly					
Subscriptions Service_2 Monthly					
Subscriptions Service_3					
Technology					
Inventory					
Webhosting and Backup					
Payment system 1 payments (#)					
Payment system 2 payments (#)					
Value payment system 2 payments					
Organization					
Number of FTE					
Payment per Hour					
Traveling Cost					
Subscriptions					
Marketing Cost					
Financial					
Price Service_1 Yearly					
Price Service_1 Quarterly					
Price Service_1 Monthly					
Price Service_2 Yearly					
Price Service_2 Quarterly					
Price Service_2 Monthly					
Price Service_3					
Value Added Tax					
Tax on Income					
Direct Mailing					
Value Service Investment Portfolio					
Value Management Investment Portfolio					
Return on Service Investment Portfolio					
Return on Management Investment Portfolio					
Price Per Payment System 1 Transaction					
Price Per Payment System 2 Transaction					

Figure 3 Anonymized cockpit of the business model engineering tool

STEP 3) IDENTIFYING CRITICAL BUSINESS MODEL PERFORMANCE INDICATORS

Business model performance indicators help to assess how well a business model is performing. By following the principles of Tennent and Friend (2005), we created a new sheet for these performance indicators. In this case study, the most important performance indicators identified were the turnover per mailing list e-mail address, the size of the mailing list, net profit after tax and the total value of a specific stock portfolio of the company.

Most of the business model performance indicators can be created by using one or more variables from the cockpit and adding a formula. For example, using the number of subscriptions for a certain service, the price people pay for their subscription, and multiplying these two, the turnover for that service can be calculated. Via expert interviews the following critical performance indicators were found:

- Total turnover: The total turnover is based on combining all the services and products that costumers use.
- Gross margin: The total turnover minus all of the organizational costs.
- Profit after tax: The total turnover minus all of the costs and taxes.
- Margin per e-mail address: The profit after tax divided by the size of the mailing list.
- Addition on management portfolio: The amount of money (profit) that can be re-invested the investment portfolio of the management of the company.
- Value management portfolio: The value of the of investment portfolio of the company's management. Because the money is mostly invested in stocks and related investments, the value can vary.
- Value VP: The value of a related investment portfolio that is specifically used for one of the premium analysis services the investment research boutique offers.

For each of these variables, charts can be easily created.

STEP 4) ADDING FUTURE SCENARIOS

Once the basics of the business model engineering tool are developed, the tool output can be made more dynamical by adding future scenarios influencing the variables as mention in Step 1. According to Tennent and Friend (2005), one of the most functional ways to create scenarios is by putting two main variables in a matrix. Predicting future scenarios is difficult and mostly doesn't make too much sense, however imagining different future scenarios and analyzing the consequences is regarded a valuable exercise because it may help to strengthen overall business model viability (Rietdijk and Van Winden 2003).

Investors simply need to have money available before they will subscribe to investment analysis services. A positive economic growth supports their willingness to subscribe. Next to that, people tend to invest more if stock markets are doing well. Considering these two findings, both market sentiment and economic growth are important, while both of them cannot be controlled by the investment research boutique, a critical prerequisite for scenario variables. Therefore, market sentiment and economic growth – both part of the external Market environment domain in the STOF-framework – were chosen as scenario variables, resulting in four scenarios: a good or bad market sentiment in combination with high or low economic growth (see also Figure 4).

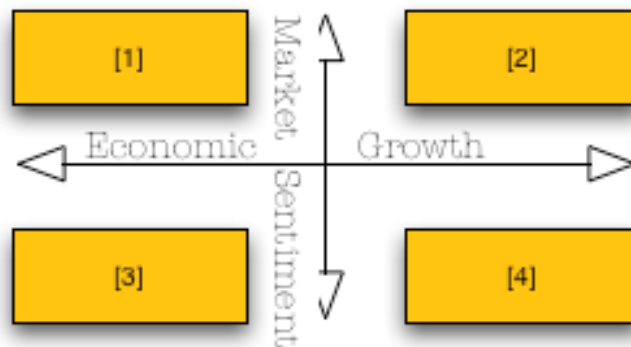


Figure 4 Scenario building based on two variables in a matrix

STEP 5) ADDING SCENARIO-BASED CALCULATIONS

As market sentiment and economic growth are set (optionally with different weights and multiplier factors in order to transform the standard variables as defined in Step 1 into scenario-based variables; see also Table 1), scenario-based calculations can be made – see Figure 5.

Market						Weight
Economic Growth	1,3	1,1	1,3	0,7	0,9	0,7
Market Sentiment	1,3	1,1	1,3	0,7	0,9	0,3
Multiplier	1,3	1,1	1,3	0,7	0,9	

Figure 5 Multiplying factor calculations – for both variables economic growth and market sentiment the weight can be set for each of the four scenarios.

Some of the standard variables are only influenced by one of the two scenario-factors. Therefore, it is also possible to make use of the market sentiment multiplier or economic growth multiplier only.

Based on calculations of e.g. turnover, profit, taxes and profit after tax, the ‘behavior’ of the business model performance indicators over a five year period can be shown by the tool. By changing the scenario and variables in the cockpit of the tool, outcomes can be generated for every scenario in different circumstances (e.g. with a large or small mailing list, high or low pricing of premium services, etc.).

STEP 6) GENERATING OUTPUT: SCENARIO BASED BUSINESS MODEL PERFORMANCE INDICATORS

Analogous to creating separate input and calculation sheets, the output results per scenario are projected on separate sheets in the form of graphical representations of business model performance indicators. Figure 6 shows an example of such a graphical representation in the form of one of the performance indicators as identified in Step 3. These graphical representations form the basis for the next step: analysis & improvement.

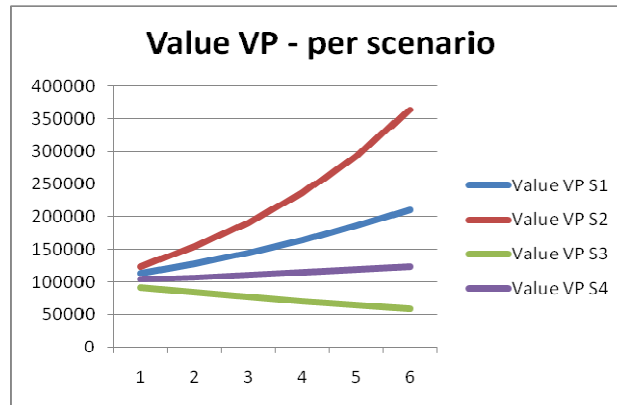


Figure 6 A graphical representation of one of the business model performance indicators – the value of an investment portfolio related to a premium service in four scenarios over a five year period.

STEP 7) ANALYSIS & IMPROVEMENT

Improving a business model design in such a way that it is expected to be viable in every scenario can only be done if the output of all of the scenarios is being analyzed. In this section, we will shortly discuss the main results of the business model analysis based on reviewing the performance indicators in each of the four scenarios as identified. Some suggestions for adaptation and fine tuning will be given as well.

It is important to mention that the calculations within each scenario are based on a grounded guess of the market sentiment and economic growth multipliers as well as the related business model variables. It is impossible to predict the future, so the figures won't be exactly correct, but as investor Warren Buffett, one of the examples of the founders of the company, once said: "It is better to be approximately right than precisely wrong."

After comparing the performance indicator results in each of the four scenarios during the five year period, we saw that the expected profit levels are relatively volatile: they may substantially increase in a positive scenario (with strong economic growth and a positive stock market sentiment) as well substantially decline in a negative scenario (with a slow or no economic growth combined with a negative stock market sentiment). Considering the most important business model performance indicator, the margin per e-mail address, we saw that different scenarios have a strong influence on this indicator. The margin may vary between less than EUR 1 and EUR 30.

Another important indicator is the value of the management investment portfolio (a money reserve owned by the founders based on 'excess profits' in earlier years). Although it initially could be used as a buffer, in good times it can become a valuable asset as well. The value in five years from now could vary between about EUR 150K in very tough market circumstances and a few million EUR in good ones.

Because of its low operating costs and the existence of a management investment portfolio, the boutique can survive tough and difficult scenarios like one with no or negative economic growth and a negative stock market sentiment. Without such an investment portfolio the online investment research boutique could go bankrupt in the toughest scenario. But even then it is expected that e.g. increasing the mailing list size would probably generate more profit – even in bad economic situations, or probably exactly because of bad economic situations, investors may see great investment opportunities. Furthermore, the boutique itself could profit from the potential investment bargains that are expected to be found in such

a scenario. In order to capitalize on these opportunities, it could be wise to create a special money reserve during better times, next to the management investment portfolio.

Because of the relatively low underlying costs, the profitability of the business model is mostly dependent on the size of the mailing list and the number of investors with subscriptions. Although the costs are relatively low, in really tough market circumstances there are still some possibilities to save money on certain costs like traveling. Second, based on the business model engineering tool results it seems a good idea to invest the profit after tax in a buffer fund. A management investment portfolio as mentioned before definitely makes sense, but the value of such a buffer on the short term is relatively uncertain because of the risk of stock market crashes. So, creating an extra low risk buffer could be worthwhile as well, not only because it may lower risks but also because this buffer could also – at least partially – be used for ‘extreme bargain investing’ when markets go down significantly. Thus, in this way the company may profit in two ways from creating and maintaining such a buffer.

Overall, the analysis shows that it would be good to try to further increase the size of the mailing list because this variable has a positive influence on all business model performance indicators – it generally leads to higher profit levels because of increased scalability. Further increasing the amount of paid subscribers relative to the size of the total mailing list is expected to have a similar positive influence, but is expected to be more difficult to achieve because this ratio is already relatively high.

THE VALUE OF THE TOOL IN PRACTICE: SUPPORTING CONTINUOUS BUSINESS MODEL ENGINEERING

The development of the business model engineering tool and the related analysis as described in the previous sections proved to be valuable for the case company: it led to critical insights related to the viability of the business model in different scenarios as well as related business model improvement ideas.

Next to that, we found in practice that the business model engineering approach also supported thinking related to coming up with specific business model experiments that could lead to business growth: when looking back at growth spurts of the investment research company we found a strong correlation between business model experiments as performed during the life cycle of the company and actual improvements in business model performance indicators.

Before founding the company in 2007, the founders designed their scalable freemium business model by describing each of the components of the STOF-framework as discussed earlier. The company started with offering a free weekly investment column to a small mailing list of about 100 Dutch and Belgian investors and a related paid monthly stock analysis service based on the value investing principles as mentioned before (Graham 2003; Oude Nijhuis and Kijl 2009). Directly from the beginning, as many processes as possible were automated by making use of e.g. online payment systems, mailing systems, content protection systems and membership management systems. As a result, a potentially strong increase in mailing list size or amount of subscribers essentially wouldn’t lead to more work for the founders of the company – in other words, income is not limited to personal output. In this way, the technological platform actually enabled the founders of the company to spend time on performing business model experimentation and effectuation actions – by focusing on creating nonlinear, so called ‘lollapalooza’ growth patterns (Bevelin 2007).

Lollapalooza tendencies

The term ‘lollapalooza’ comes from Charlie Munger, an American investor, and stands for ‘the tendency to get extreme consequences from confluences of [...] tendencies acting in favor of a particular outcome’ (Bevelin 2007; Munger 2005). Let’s have a look at the power of compounding (a confluence of time, investment return and money invested) to illustrate the power of such a lollapalooza tendency: a person who starts investing EUR 2,000 on a yearly basis with an average yearly return of 10% will have invested EUR 80,000 and will end up with EUR 973,704 when he or she gets 65 years old – the initial investment grew 11-fold; a person who starts investing EUR 2,000 a year with the same yearly return of 10% at an age of 19 and stops investing at age 26 will have invested EUR 14,000 in total but will end up with EUR 944,461 – in this case, the money grew 66-fold instead 11-fold, only because of a few compounding years extra (Russell).

Searching for ‘lollapalooza confluence patterns’

After identifying the most critical variables for the performance indicators of their scalable business model as identified earlier (e.g. size of the mailing list, margin per address and investment return – see also Figure 3), the founders of the company started thinking of and implementing actions that could lead to a substantial increase of these variables. The idea was that the *combined* results of these ‘lollapalooza confluence pattern actions’ should lead to a substantial improvement of the most important business model performance indicators. Some examples of these, actually multidisciplinary, patterns are given below (with the change in critical business model variables italicized):

- Free weekly investing columns → first mailing list of investors → first customers of paid investment service → money invested in marketing + internet marketing courses → *bigger mailing list of investors*
- Free weekly investing columns → financial publisher published a book based on weekly columns → book became bestseller → free publicity → *bigger mailing list of investors*
- Free weekly investing columns → more and better knowledge about investment methods → *better investment returns*
- *Bigger mailing list of investors* → ‘excess cash’ for investment portfolio → new investment portfolio premium service next to analysis service → *more money for investment portfolio*
- ...

Although each pattern in itself led to an increase of business model performance indicators, it was actually the *combination* of these and similar patterns that really led to a strong underlying growth. In about two years, the list size multiplied more than 300-fold and profitability strongly increased as well. And because of a higher profitability, more funds will be available for investments, which helps the founders to profit more strongly from the earlier mentioned power of compounding as well – another lollapalooza pattern in itself.

Of course, these ‘lollapalooza confluence pattern actions’ didn’t always work out, e.g. an experiment with newspaper based advertisements failed miserably. However, because the cost and risk levels of these experiments were generally relatively low, the founders emphasized experimentation and action over in-depth analysis.

Although outcomes will not be known in advance, simple experiments like giving a digital version of the investment book as mentioned above away to all readers of the free weekly newsletter if they inform

three or more friends may lead to a strong increase in mailing list size, one of the critical performance indicators. Therefore, the founders intend to continue coming up with creative 'lollapalooza confluence pattern' experiments in order to try to further increase the business model performance indicators. Online information services like the ones offered by the investment research are ideally suited for experiments with e.g. pricing and reusing information.

Such an experimental approach matches quite nicely with the 'discovery driven' rather than analytical approach to business modeling as proposed by McGrath (2010) as well as the effectuation concept of Sarasvathy (2008).

CONCLUSIONS

In this paper, we concisely discussed the development as well as evaluation of a business model engineering approach in the form of a case study. We started from the premise that with the related engineering tool, organizations could monitor, test, adapt and fine tune their business models by analyzing the different business model performance indicators that formed the output of the tool.

The first results are encouraging: the investment research startup case study showed that the business model of the company indeed could be tested in different scenarios and strengths and weaknesses and related opportunities and threats were discovered as well. Based on this scenario-based business model analysis, opportunities for further business model improvements were also developed.

Next to that, the tool also supported continuous business model engineering: we saw that the tool supported the founders of the company in coming up with ideas for growth, by creating 'lollapalooza confluence pattern' experiments impacting the most critical business model variables and performance indicators.

Although the research as described in this paper had an experimental character, we do expect that continuous business model engineering with a scenario based support tool with business model performance indicators may lead to more viable and better business model implementation and healthier businesses in other cases as well.

Next steps in further developing the business model engineering tool could be to consequently combine several scenarios and related calculations into scenario storylines (2 years scenario 1, 1 year scenario 4, 2 years scenario 3, etc.) and to add more non-financial business model performance indicators as well. In order to further test and improve the added value of the business model engineering approach as well as the related 'lollapalooza confluence pattern' experiments, we also plan to do more case studies.

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