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STRATEGIC PERFORMANCE MEASUREMENT FOR EBUDDY

Strategic performance measurement for eBuddy

May 2007

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Management summary

Motivation

eBuddy management wants to define and implement strategic performance measurement to improve strategic decision making by reducing the necessary time to support decisions and by gaining a solid and complete view on eBuddy's strategic performance.

Recommendations

1) Assess strategic performance with the strategic performance measures identified in eBuddy's balanced scorecard, as defined in this research;
2) Assign a responsible employee for monthly reporting of the balanced scorecard;
3) Update the balanced scorecard based on changes in strategic objectives;
4) Define desired employee skills and measure these in the balanced scorecard;
5) Develop an information system to present the defined strategic performance measures;
6) Involve business unit directors in strategic performance assessment;
7) Use the balanced scorecard to facilitate problem solving and action planning.

Argumentation

1) The eBuddy balanced scorecard is defined according to Kaplan & Norton's model (Kaplan & Norton 1996). This model provides a comprehensive set of guidelines for definition and implementation of strategic performance measurement and is supported by extensive literature attention. The steps taken towards the definition and implementation of eBuddy's balanced scorecard were based on the roadmap identified by Assiri et al. (Assiri et al. 2006). This roadmap is currently the most comprehensive available in literature, researching the best practice experiences from the definition and implementation of the balanced scorecard from a large number of companies differing in location, sector and size.

   The strategic performance measures in eBuddy's balanced scorecard are based on eBuddy's strategy map and the available in-house data. eBuddy's strategy map presents all strategic objectives through the organization, linked by cause-and-effect relationships. The contents of this strategy map were defined from conclusions of two management interview sessions and an evaluation of the results. This evaluation supported conclusions by a literature model or data on past experience. The available in-house data was researched and the different sources of data for the calculation of the strategic performance measures were identified.

2) The balanced scorecard has to be calculated on a monthly basis to facilitate internal and external benchmarking.

3) The balanced scorecard is not static, the strategy map and measures should be updated on regular basis, corresponding future changing strategic objectives.

4) eBuddy's balanced scorecard is not complete. No strategic performance measure for employee skills could be identified from in-house data. For the completion of the scorecard, desired employee skills should be defined.

5) Within this research a proof of concept Excel spreadsheet was developed. Final implementation through the organization requires the development of an information system.

6) Involving business unit directors in strategic performance assessment with the balanced scorecard creates a common understanding of strategic objectives and each unit's contribution to the overall company strategy.

7) The scorecard can facilitate problem solving and action planning because it facilitates internal benchmarking and indicates cause-and-effect relationships between strategic objectives. It can be used to communicate and develop common understanding of a problem and the scorecard results can be used to signify that a problem solution has been found.

Consequences

The recommended strategic performance measurement system provides a complete and founded view on eBuddy's strategic performance and reflects common objectives by being aligned with the strategy. It facilitates solid and efficient strategic decision support by providing a small group of measurable, meaningful, and accurate performance measures. With this strategic performance measurement system, the desired improvements on strategic decision support can be made.

Acknowledgements

Dear reader,

First of all, thank you for your interest in this research. This thesis describes the results of my graduation research within the study Business Information Technology at the University of Twente. With this research, carried out from October 2006 to May 2007 at eBuddy in Amsterdam, my study is completed.

I first heard of eBuddy in an article in the Intermediar magazine. Immediately, I was very interested in the company. Over the last years, my interest in entrepreneurship and the internet and mobile sector has grown constantly. After starting up several companies myself during my study I became sure that I wanted to work in an environment of a young dynamic company offering innovative products in the internet and mobile sector. eBuddy is an exact match to this description.

The objective of this research gave me the chance to gain a clear insight in the various different business processes within eBuddy and I was able to gain a good learning experience on challenges faced in defining and adapting strategy in a fast changing company environment.

My thanks go to Jan-Joost Rueb, Onno Bakker and Paulo Taylor for providing me the opportunity to carry out my graduation research at eBuddy. Their enthusiasm and drive in running their company is very catching. Also thanks to all my colleagues at eBuddy for assisting me in this research and providing valuable feedback.

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Last thanks go to Arjen Hartman, Hans Schaap and Paul Allin for providing feedback on my thesis.

I hope you will appreciate the contents of this thesis. For questions or feedback on this research project, always feel free to contact me.

Kind regards,

Vincent Hoogsteder
May 2007

Contents

List of definitions **8**
1 Introduction **9**
1.1 eBuddy 9
1.1.1 History 9
1.1.2 Mission 9
1.1.3 Products 10
1.1.4 Target market 10
1.2 Research motivation and objective 11
1.2.1 Motivation 11
1.2.2 Objective 12
1.2.3 Preconditions 12
1.3 Research model 13
1.3.1 Research questions 13
1.3.2 Research material 14
1.3.3 Research model 14
2 Theoretical background **16**
2.1 Balanced scorecard selection 16
2.1.1 The balanced scorecard 17
2.1.2 Alternatives to the balanced scorecard 20
2.1.3 Model selection 22
2.2 Balanced scorecard roadmap 23
2.2.1 Assiri et al.'s roadmap 23
2.2.2 Best practice definition and implementation roadmap 23
2.2.3 eBuddy balanced scorecard roadmap 24
2.3 Customer satisfaction model 26
2.3.1 Selection of Fornell's model 26
2.4 Assessment of environmental uncertainty 27
3 Management interviews **28**
3.1 Approach 28
3.2 Interview results 29
3.2.1 eBuddy's strategy 29
3.2.2 Determinants of company value 30
3.2.3 Acquisition of product users 31
3.2.4 Revenue generation 32
3.2.5 Added value of eBuddy products 32
3.2.6 Environmental uncertainty 32
3.3 Evaluation of interview results 34
3.3.1 Determinants of company value 34
3.3.2 Product user satisfaction 34
3.3.3 Revenue generation 35
3.3.4 Added value of eBuddy products 36
3.3.5 Environmental uncertainty 36
3.4 Conclusions 37
3.4.1 Balanced scorecard roadmap evaluation 38
4 Definition of eBuddy strategic map **39**
4.1 Financial perspective 41
4.2 Customer perspective 41
4.3 Internal business process perspective 41
4.3.1 Product user satisfaction 42
4.3.2 Objectives for product user satisfaction 43
4.3.3 Media coverage 44
4.3.4 Number of advertisements sold 44

4.4 Learning and growth perspective 44
4.5 Conclusions 45
4.5.1 Balanced scorecard roadmap evaluation 45
5 Definition of strategic performance measures 46
5.1 Approach 46
5.2 In-house data 46
5.2.1 The data warehouse 46
5.2.2 Site compensation report 47
5.3 Financial perspective 48
5.4 Customer perspective 48
5.4.1 Increase number of product users 48
5.4.2 Increase level of viral marketing 48
5.4.3 Increase product usage 49
5.4.4 High level of product user satisfaction 50
5.5 Internal business process perspective 51
5.5.1 Create simplicity of product usage 51
5.5.2 Offer market unique product features 51
5.5.3 High login performance 52
5.5.4 Increase number of advertisements sold 52
5.5.5 Increase media coverage 52
5.6 Learning and growth perspective 53
5.6.1 Product user interaction 53
5.6.2 Employee skills 53
5.7 eBuddy's balanced scorecard 54
5.8 Conclusions 55
5.8.1 Balanced scorecard roadmap evaluation 55
6 Implementation 56
6.1 Implementation roadmap 56
6.2 Initial plan 57
6.3 Data warehouse database queries 58
6.3.1 Number of product users 58
6.3.2 Number of viral messages 59
6.3.3 Average duration 59
6.3.4 Average number of chat conversations 60
6.3.5 Average number of logins per product user 60
6.3.6 Churn 61
6.3.7 Successful login percentage 62
6.3.8 Percentage of advertisements sold 63
6.4 Selection of software application 65
6.4.1 Regular reporting 65
6.4.2 Excel spreadsheet 66
6.5 Conclusions 70
6.5.1 Evaluation of implementation roadmap 70
7 Conclusions and recommendations 72
7.1 Answers on research questions 72
7.2 Recommendations 76
7.2.1 Implement process and assign responsibilities 76
7.2.2 Corporate alignment 76
7.2.3 Balanced scorecard updating 77
7.2.4 Problem solving and action planning 77
7.2.5 Define and measure employee skills 78
7.2.6 Implementation through organization 79
7.2.7 Development of information system 80
7.2.8 Recommendation priorities 80
7.3 Research evaluation 81

7.3.1 Definition of research objectives 81
7.3.2 Balanced scorecard scepticism 81
7.3.3 Application of balanced scorecard roadmap 81
7.3.4 Research planning 82
7.4 Research contribution 83
7.4.1 Contribution to eBuddy 83
7.4.2 Academic value 83
7.5 Recommendations for future research 86
7.5.1 Correlation of company value determinants 86
7.5.2 Possibilities for improved product user interaction 86
7.5.3 Evaluation of data warehouse contents 86
7.5.4 Case study research for small internet companies 87
8 References 88
Appendix 1: eBuddy products 90
Appendix 2: Information systems 93
Appendix 3: Balanced scorecard roadmap 95
Appendix 4: Viral marketing messages 98
Appendix 5: eBuddy data warehouse 100
Appendix 6: eBuddy blog references 103
Appendix 7: eBuddy user interface flow chart 104
Appendix 8: eBuddy competitive Wiki 105
Appendix 9: eBuddy media coverage 106
Appendix 10: eBuddy blog 107

List of definitions

Table 1 highlights used definitions and their meanings applied in this thesis.

Benchmarking	An ongoing process of measuring and improving products, services and practices against the best that can be identified worldwide (McGaughey 2002).
Chatting	Communication between two or more people by instant messaging.
eBuddy product user	A person who has used one of eBuddy's products since its introduction at least once.
Instant messaging	Real-time communication between two or more people based on typed text, images, voice and video which is conveyed via hardware that is connected to the internet.
Instant messaging network	A computer network consisting of hardware, software and network connections that offers instant messaging through the internet.
Online advertisements	Banners and text-links which are presented embedded in websites or software applications. They are intended to attract traffic to a website by linking viewers to the web site of the advertiser. Banners are constructed from an image or multimedia object, often employing animation or sound. Text-links are plain text fragments.
Product usage	Started when a product user logs in on one of eBuddy's products and ends when a user log's out.
Status message	A function of instant messaging applications whereby a user posts a message that appears automatically to all his contacts. Status messages often contain a description whether the person is available for instant messaging conversations at the moment or what he is doing.
Strategic performance	The result in day-to-day business of strategic goals set.
Strategic performance measures	Financial and non-financial metrics used to quantify objectives to reflect strategic performance of an organization.
Strategic performance measurement	Measuring the result in day-to-day business of strategic goals set. This result is measured by strategic performance measures.
Strategic decision making	Decisions and actions used to formulate and implement strategies that will provide a competitively superior fit between the organization and its environment so as to achieve organizational goals (Daft 2000).
Strategy	The plan of actions that prescribes resource allocation and other activities for dealing with the environment and helping the company attain its goals (Daft, 2000).
Viral marketing	The use of electronic communications to trigger brand messages throughout a widespread network of buyers (Dobele et al. 2005). It is the word-of-mouth applied to the internet (Moore 2003) and exploits existing social networks by encouraging customers to share product information with their friends (Leskovec et al. 2006).
Word of mouth	Recommendation of eBuddy by product users in chat conversations.

Table 1: List of definitions

1 Introduction

This first chapter provides a short introduction to the company eBuddy in Section 1.1. Section 1.2 outlines the motivation for this research and the research objective. The approach taken to answer the research objective is outlined in the research model, described in Section 1.3. This final section of the first chapter also outlines the structure and contents of the complete thesis.

1.1 eBuddy

This section provides an overview of the company eBuddy. It highlights the company's history, mission, products and target market.

1.1.1 History

eBuddy was founded in 2004 by the current owners Jan-Joost Rueb, Onno Bakker and Paulo Taylor. Taylor developed the first website that provided worldwide access to instant messaging[1] without the need for software installation, which originated from a bet he had with friends. He claimed he could make instant messaging possible on an old fashion telephone, and succeeded. His website offered access to Microsoft's MSN instant messaging network[2] from any computer connected through to the internet, without requiring software installation. At first, Taylor started offering this product as a hobby next to former job. The number of product users[3] showed an enormous growth, without any marketing. Bakker and Rueb saw business potential and started eBuddy together with Taylor.

In the start-up phase the strategy and tasks were very clear. Taylor would improve the product and develop new product capabilities, Bakker would make the product scalable and accessible to a growing number of users worldwide and Rueb would make the company profiTable by publishing online advertisements[4]. The number of users was constantly growing at a fast pace and there were no competitors in the market. The strategy was to be able to handle the growth of users and generate as much revenue as possible.

Today, three years later, the company finds itself in a completely new situation. The start-up phase is over. There are over thirty employees on the pay roll, over ten competitors in the market and five million euros external funding have been raised to ensure the company's growth in the future.

1.1.2 Mission

A company's mission describes the vision, its shared values and believes and its reason for being (Daft 2001). eBuddy's mission is to "*Provide instant messaging for everyone everywhere*". eBuddy's vision is that instant messaging should be available to everyone, irrespective of which hardware device, software and instant messaging network a person has access to.

[1] Real-time communication between two or more people based on typed text, images, voice and video which is conveyed via hardware that is connected to the internet.

[2] A computer network consisting of hardware, software and network connections that offers instant messaging through the internet.

[3] A person who has used one of eBuddy's products since its introduction at least once.

[4] Online advertisements consist of banners and text-links which are presented embedded in websites or software applications. They are intended to attract traffic to a website by linking viewers to the web site of the advertiser. Banners are constructed from an image or multimedia object, often employing animation or sound. Text-links are plain text fragments.

1.1.3 Products

eBuddy currently has translated its mission into three products:

- Web messaging: offers instant messaging through all major instant messaging networks on any computer connected to the internet, without the need for software installation;
- Mobile messaging; offers instant messaging through all major instant messaging networks on any mobile phone or mobile gaming device connected to the internet, without the need for software installation;
- Television messaging: offers instant messaging through all major instant messaging networks on any TV connected to the internet, without the need for software installation.

A person who wishes to use instant messaging chooses one or more of the worldwide instant messaging networks; MSN (Micosoft), AIM (America Online), Yahoo, Skype, Google Talk or the Chinese QQ. These networks all provide software, called a chat[5] application that needs to be installed on a computer. With this application, a person can chat with his contacts. The networks are not integrated, so a person who for example uses Microsoft's MSN is not able to chat with his contacts that use America Online's AIM. Therefore, on average each user of instant messaging uses two different instant messaging networks to be able to chat with all his contacts (Radicati 2006).

Web messaging replaces the need for the installation of a chat application on a computer and is accessible through a web browser on any computer connected to the internet. Mobile messaging offers instant messaging on mobile phones and mobile gaming devices, which was not possible before. This gives product users the ability to use instant messaging on the road, using their regular mobile phone. Television messaging also creates new possibilities to use instant messaging, from any regular television. See Appendix 1 for screenshots of the products.

All three products are also capable of collecting all contacts from different instant messaging networks together, replacing the need for multiple chat applications if a person uses more than one instant messaging networks to chat with his contacts.

1.1.4 Target market

eBuddy targets at reaching a global market of product users. Currently, the total number of product users has reached 45 million. The current percentage of users per continent is: 33% Europe, 20% North America, 28% South America, 14% Asia, 4% Australia Pacific and 1% Africa.

eBuddy aims to reach the following market segments per product:
Web messaging:

- Youth and students, who already use instant messaging, at schools who can not use the regular chat applications due to restrictions on the school's computers;
- Working professionals, who already use instant messaging, at organizations who can not use the regular chat applications due to restrictions on the organization's computers.

Mobile messaging:

- People who already use instant messaging and own a mobile phone capable of connecting to the internet.

Television messaging:

- People who already use instant messaging and own a television capable of connecting to the internet.

[5] Chatting is communication between two or more people by instant messaging.

eBuddy faces over ten competitors for its web- and mobile messaging products. New competitors enter the market in a fast pace and offer comparable products. For television messaging no competitors currently exist.

1.2 Research motivation and objective

This Section highlights the motivation for this research, the objective and preconditions. The formulation is based on Verschuren and Doorewaard's research on research design (Verschuren & Doorewaard 1999).

1.2.1 Motivation

eBuddy's mission is to "*Provide instant messaging for everyone everywhere*". While pursuing its mission, eBuddy management wants to build a growing company with a growing company value, to satisfy its shareholders. Management believes that the number of product users, the revenue generated and the amount of media coverage are the determinants of company value for eBuddy. These determinants influence strategic decision making[6].

Because there are three different determinants of eBuddy's company value management wants to influence, management is faced with the challenge to assign priorities and resources to each of these different determinants. Furthermore, eBuddy's company environment is changing rapidly, which requires management to adapt its strategy to this changing environment, which requires solid and efficient decision making support.

Currently, management supports strategic decision making with information from several different sources:

1. The "eBuddy Dashboard" information system. This provides information on daily product user statistics. It calculates growth of the number of product users by comparing it to the previous week. See Appendix 2 for a screenshot;
2. The "eBuddy hourly ad view comparison" information system. This provides information on the number of advertisements published per hour. It calculates growth of the number of published advertisements by comparing the numbers with the same hour each day of the previous week, for the last half year. See Appendix 2 for a screenshot;
3. The "Site compensation report". This is a spreadsheet which provides information on the daily generated revenue from online advertisements;
4. The "Month report". This is a spreadsheet which provides information on the number of product users per month and calculates growth by comparing the number to that of preceding months;
5. Financial forecasting and budgeting calculations.

These five sources of information to support strategic decision making all have a different scope and objective. As a result, management receives a large amount of data that does not reflect a common objective and does not provide comparable measures. When management tries to support strategic decisions, the conclusions based on information from the various sources often contradicts. Consequently, it takes a lot of management's time to interpret the information and come to solid conclusions to support decision making.

[6] Decisions and actions used to formulate and implement strategies that will provide a competitively superior fit between the organization and its environment so as to achieve organizational goals (Daft 2000).

The problem definition for this research is:

It is very time consuming for management to support strategic decisions.

The information that eBuddy currently uses for strategic decision support does not reflect common objectives, does not provide comparable measures, consists of an extensive amount of measures and information from different sources often presents contradicting conclusions.

After its start-up phase, eBuddy has entered the next phase of its company existence. Resources for growth are available from externally raised funding. Management is challenged to set a course and allocate recourses in order to create and maintain company growth in a fast changing company environment. This requires management to be able to support strategic decision making solid and efficient.

1.2.2 Objective

To solve the problem stated in the problem definition, management identified the need for strategic performance measurement[7] to support strategic decision making solid and efficient. By implementing strategic performance measurement, management wants to improve strategic decision making by reducing the necessary time to support decisions and by gaining a solid and complete view on eBuddy's strategic performance.

The objective of this research is:

To define and implement strategic performance measurement for eBuddy.

This strategic performance measurement should aim to provide a complete and founded view on eBuddy's strategic performance and should reflect common objectives by being aligned with the company's strategy. Furthermore, it should facilitate efficient strategic decision support by providing a small group of measurable, meaningful, and accurate performance measures.

After the definition of the strategic performance measures, the implementation focuses on making the measures accessible for management. This concerns the gathering of in-house data, calculation and presentation of the measures.

1.2.3 Preconditions

The need for strategic performance measurement is aimed at short-term fulfilment. Therefore, the initial focus lies on calculation of strategic performance measures with data that is already available in-house. As a consequence, this focus creates a dependency between the current quality of information provision within eBuddy and the research results.

The definition of the strategic performance measures should aim on providing the best possible measures with in-house data currently available. If the current information provision within eBuddy is not capable of providing the necessary data to define solid strategic performance measures, shortcomings of this current information provision and recommendations on steps to take for necessary improvement should be made.

[7] Strategic performance is the result in day-to-day business of strategic goals set. Strategic performance measurement is measuring the strategic performance. This measurement is done with strategic performance measures. Strategic performance measures are financial and non-financial metrics used to quantify objectives to reflect strategic performance of an organization.

In this situation, the definition of the strategic performance measures will not be dependent on the data currently available in-house, but at the minimal set of necessary measures required to assess eBuddy's strategic performance solid and efficient. Before the necessary information provision improvement steps are taken, the defined strategic performance measures will not be usable.

1.3 Research model

This section outlines the research model by identification of research questions, material, model and clarifies the structure of this thesis.

1.3.1 Research questions

The research objective outlined in Section 1.2.2 leads to the central research question:

> *How can eBuddy define and implement strategic performance measurement?*

This central research question is split into sub-questions. These sub-questions combined lead to the answer on the central research question and cover the research objective.

The identified sub-questions are:

1) How can strategic performance measurement be defined and implemented for eBuddy according to literature?
    a. What is strategic performance measurement?
    b. Which literature models are available for the definition and implementation of strategic performance measurement?
    c. Which model is selected from literature for application to eBuddy to define and implement strategic performance measurement?
    d. What is a roadmap to define and implement strategic performance measurement by the selected literature model from best practices?
2) What is eBuddy's strategy?
    a. What is eBuddy's defined strategy by management?
    b. What are management's motives and believes behind the strategy?
3) What is available in-house data for the calculation of strategic performance measures?
4) What are strategic performance measures for eBuddy?
5) How can eBuddy implement the defined strategic performance measures?

The central research question is two-fold, with a definition and implementation component. The first step in answering the definition component is to define the concept of strategic performance measurement from literature (question 1a). The second step is to research available models in literature to define strategic performance measures (question 1b). The target of this step is to acquire solid guidelines in defining the measures for eBuddy. Therefore, from available literature, a specific model is selected for application (question 1c). The last step of this literature research is to define a roadmap for the definition and implementation of strategic performance measures with the selected literature model from best practices (question 1d). This roadmap is used as guideline through this research.

Before the selected literature model can be applied, the next step is to focus on eBuddy's strategy. Since strategic performance measurement is aimed at measuring the company's performance on its strategy, the identified strategy by management (question 2a) and management's motives and believes behind the strategy (question 2b) are subjects of research.

Question 2 provides the input for the application of the selected literature model in question 1. The precondition for this research is that the strategic performance measures have to be calculated with data currently in-house. Therefore, the final step before the selected literature model can be applied is to research the data currently available in-house that can be used for the calculation of the defined strategic performance measures (question 3). This step answers the preconditions of this research (see Section 1.2.3).

The application of this selected literature model leads to the definition of specific strategic performance measures for eBuddy (question 4). Questions 1 to 4 together answer the definition component of the central research question.

The implementation component (question 5) is carried out according to the defined roadmap (question 1d) with input of the defined strategic performance measurement (question 4), the available in-house data for calculation of the measures (question 3) and the recommendation from best practices (question 5).

Question 5 answers the implementation component of the central research question. Together, the total set of sub-questions answer the identification and implementation components of the central research question and therefore cover the research objective.

1.3.2 Research material

To answer the research questions, research material from different sources is required. The research questions focus on several research objects. The most important research objects are strategic performance measurement, best practices of strategic performance measurement definition and implementation by the selected literature model, eBuddy's strategy and eBuddy's in-house available data.

For strategic performance measurement, research material consists of available literature in this field. Research material for best practices of strategic performance measures definition and implementation by the selected literature model consists of case studies available in literature. For eBuddy's strategy, research material is acquired through interviews with eBuddy management. Research material for eBuddy's in-house available data consists of eBuddy's in-house databases.

1.3.3 Research model

Figure 1 shows the research model following from the research objectives, questions and material (Verschuren & Doorewaard 1999).

The strategic performance measurement literature (research question 1), the management interviews (question 2), the analysis of in-house databases (question 3) lead to the definition of strategic performance measurement (question 4). This definition leads to the implementation of the strategic performance measures (question 5) and the final conclusions and recommendations.

This thesis is structured following the research model; for each part of the research model, Figure 1 provides the chapter where this part is discussed.

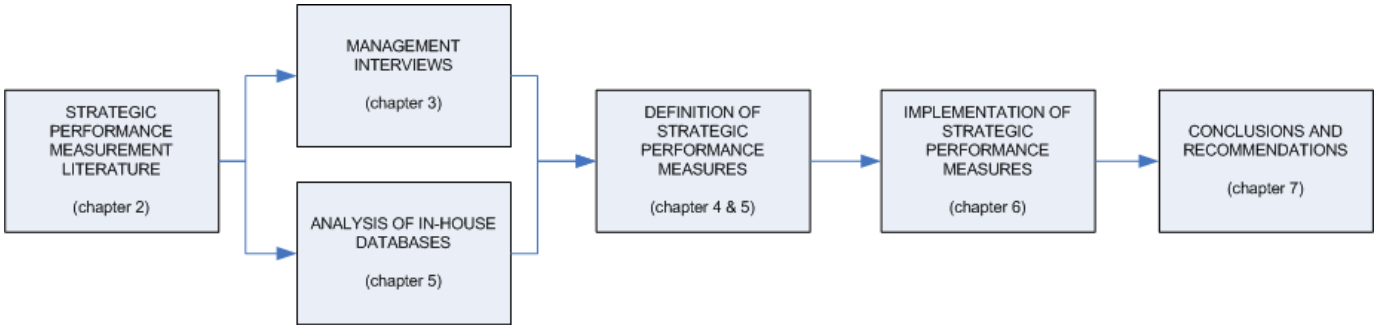


Figure 1: Research model

2 Theoretical background

This theoretical background chapter provides an overview of all literature models discussed, selected and applied in this research. The applied models are:

1) The balanced scorecard by Kaplan & Norton (Kaplan & Norton 1996);
2) Assiri et al.'s balanced scorecard definition and implementation roadmap (Assiri et al. 2006);
3) Fornell's customer satisfaction model (Fornell et al. 1996);
4) Daft's framework for assessing environmental uncertainty (Daft 2001).

The balanced scorecard is selected as literature model to define strategic performance measures for eBuddy, described in Section 2.1. Assiri et al.'s roadmap is applied to identify the steps to take for the definition and implementation of strategic performance measures with the balanced scorecard within eBuddy, described in Section 2.2. Two additional models that support this definition and implementation process are Fornell's customer satisfaction model, discussed in Section 2.3 and Daft's framework for assessing the level of environmental uncertainty, discussed in Section 2.4.

2.1 Balanced scorecard selection

This section describes the selection of a literature model to define strategic performance measures for eBuddy. Discussed literature that provides a model to define strategic performance measures consists of:

1) The balanced scorecard by Kaplan & Norton (Kaplan & Norton 1996);
2) The balanced scorecard model by Maisel (Mailsel 1992);
3) The performance pyramid by McNair (McNair et al. 1990);
4) Effective progress and performance measurement by Adams & Roberts (Adams & Roberts 1993).

Several other models have been developed for measuring performance of an organization, such as the Performance prism (Neely 2002) and Value based management (Ittner & Larcker 2001). These models are not taken into account in the literature selection because their primary focus does not fit this specific research. The Performance prism primarily aims at managing stakeholder relationships. The target of this research is to identify strategic performance measures that eBuddy can use to internally measure its own strategic performance. Managing stakeholder relationships falls out of research scope. Value based management measures value creation by economic profit measures. This research does not focus on the identification of value creation.

The balanced scorecard by Kaplan & Norton is selected as literature model to define strategic performance measures for eBuddy, which will be clarified in Section 2.1.3. Sections 2.1.1 and 2.1.2 discuss the balanced scorecard and give a brief overview of the other available literature on the selected topic.

2.1.1 The balanced scorecard

The balanced scorecard model, developed by Kaplan and Norton (Kaplan & Norton 1996), aims at translating an organization's mission and strategy into a set of performance measures that provides the framework for a strategic measurement and management system.

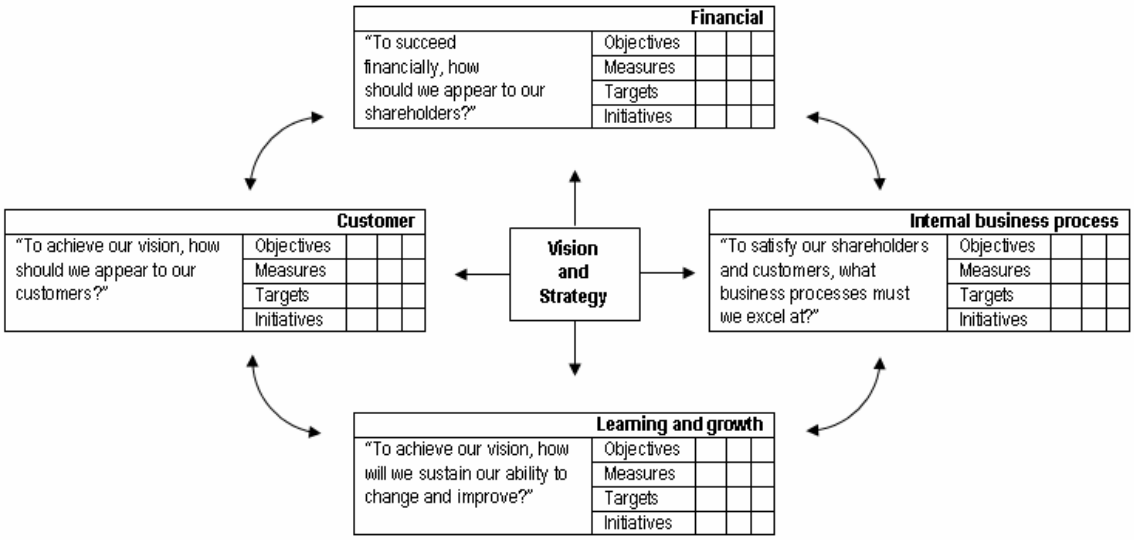


Figure 2: The balanced scorecard framework (Kaplan & Norton 1996)

Figure 2 shows the balanced scorecard framework. The idea behind the framework is that the evaluation of an organization should not be restricted to the traditional financial performance measures but should be supplemented with measures concerning customer satisfaction, internal business processes and the ability to innovate. Therefore the proposed framework consists of four different perspectives; financial, customer, internal business processes, and learning and growth. These perspectives represent the major stakeholders of the business; shareholders, customers and employees, thereby ensuring that a holistic view of the organization is used for strategic reflection and implementation (Kaplan & Norton 1996). For each perspective the objectives, measures, targets and initiatives are identified. The objectives and measures are derived from the organization's vision and strategy.

One of the primary motivations for developing the balanced scorecard was top management being overwhelmed with data and spending too much time analyzing this rather than on making decisions. In today's complex competitive environment, organizations need to be agile and flexible. As a result, availability of the right information at the right time for both decision making and performance evaluation has become critical (Banker et al. 2003).

Historically, the measurement system for business has been financial. An organizations success or failure cannot be motivated or measured in the short run by the traditional financial accounting model. This model measures events of the past, not the investments in capabilities that provide value for the future (Kaplan & Norton 1996). The balanced scorecard complements financial measures of past performance with measures of the drivers to future performance. The balanced scorecard paradigm is that the financial results are obtained by successful implementation of strategic initiatives in the key business perspectives, as opposed to being their driving force (Mooraj et al. 1999).

Besides translating mission and strategy to measures, the balanced scorecard can help an organization clarify and communicate its vision and strategy and gaining consensus throughout the whole organization (Kaplan & Norton 1996).

The four perspectives in the balanced scorecard framework (see Figure 2) and their meanings [KAN96] are:

1) Financial; measures summarizing the readily measurable economic consequences of actions already taken.
2) Customer; the customer and market segments in which the organization will compete and the measures of the organizations performance in these targeted segments.
3) Internal business process; the internal processes required in order for the organization to excel at providing the value expected by the customers both productively and efficiently.
4) Learning and growth; identifies the infrastructure that the organization must build to create long-term growth and improvement.

To put the balanced scorecard to work, companies need to translate each of the perspectives into corresponding metrics and measures that asses the current situation. These assessments have to be repeated periodically and have to be confronted with the goals set beforehand (Grembergen & Amelinckx 2002). The importance with each of these perspectives is that the perspectives themselves and the measures chosen are consistent with the organizations strategy (Mooraj et al. 1999).

There are three principles that enable an organization's balanced scorecard to be linked to its strategy; cause-and-effect relationships, performance drivers and linkage to financials (Kaplan & Norton 1996).

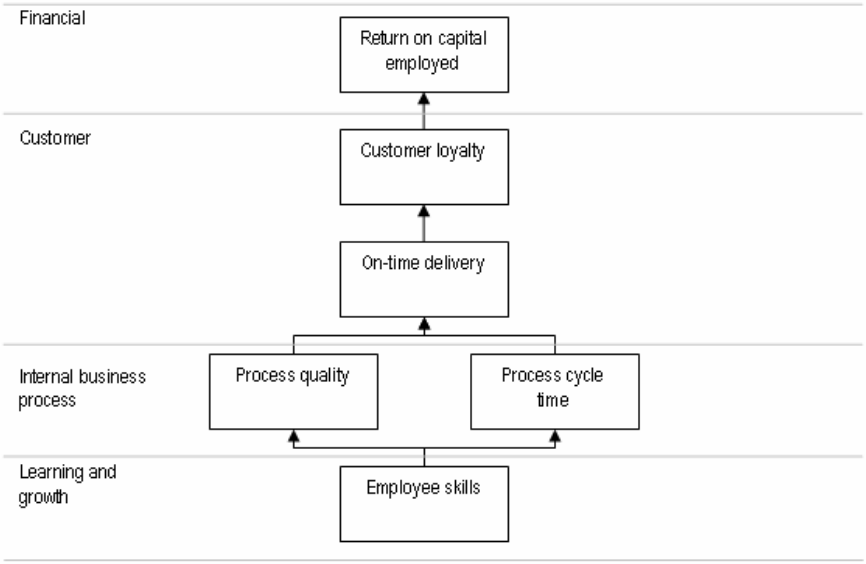


Figure 3: Example of balanced scorecard strategy map (Kaplan & Norton 1996)

A strategy is a set of hypotheses on cause-and-effect (Kaplan & Norton 1996). A balanced scorecard should tell the story of the organizations strategy through a sequence of cause-and-effect relationships expressed in if-then statements. These relationships are shown in a strategy map. Figure 3 shows an example of a strategy map.

The measurement system should make the relationships among objectives in the various perspectives explicit so they can be managed and validated. All cause-and-effect relationships in a balanced scorecard must be linked to financial objectives.

This can be seen in the example in Figure 3; the cause-and-effect relationships are identified through a top-down approach, translating financial objectives downwards to objectives in each perspective. The example shows that for the financial objective “return on capital employed”, “customer loyalty” is an objective in the customer perspective. For “customer loyalty”, “On-time delivery” follows as an objective, and so on. With this top-down approach all cause-and-effect relationships can be derived from the financial objectives.

For each objective in the cause-and-effect relationships a set of measures is identified. Measures in the balanced scorecard can be divided in outcome measures and performance drivers. Outcome measures are lag indicators that signal the ultimate objectives of the strategy and whether near-term efforts have led to desirable outcomes. The performance drivers are lead indicators that signal to all organization’s participants what they should be doing today to create value in the future. Performance drives and outcome measures should be linked to make clear how to create future value for the organization’s strategy and to monitor whether actions are translated into short-term business expansion and financial performance. When all measures are identified, the balanced scorecard can be created. Figure 4 shows an example of a balanced scorecard.

Strategic objectives	**Strategic Measurements**	
	(Lag indicators)	**(Lead indicators)**
Financial Improve returns	Return-on-investment	Revenue mix
Customer Increase customer satisfaction	Customer retention	Satisfaction survey
Internal Understand our customers	New product revenue	Hours with customers
Learning and growth Develop strategic skills	Employee satisfaction	Strategic job coverage ratio

Figure 4: Balanced scorecard example (Kaplan & Norton 1996)

The balanced scorecard represents a balance between external measures for shareholders and customers and internal measures for critical business processes, innovation, and learning and growth. The measures are balanced between outcome measures, results from the past, and performance indicators, drivers of future performance. The scorecard is balanced between objective easily quantified outcome measures and subjective performance drivers of the outcome measures.

2.1.2 Alternatives to the balanced scorecard

In the literature there are a number of alternatives theories that are also designed to measure the business performance and to link the measures used to the organization's strategy. These alternatives will be discussed briefly.

Maisel has also developed a balanced scorecard with four perspectives in which the business should be measured (Maisel 1992).

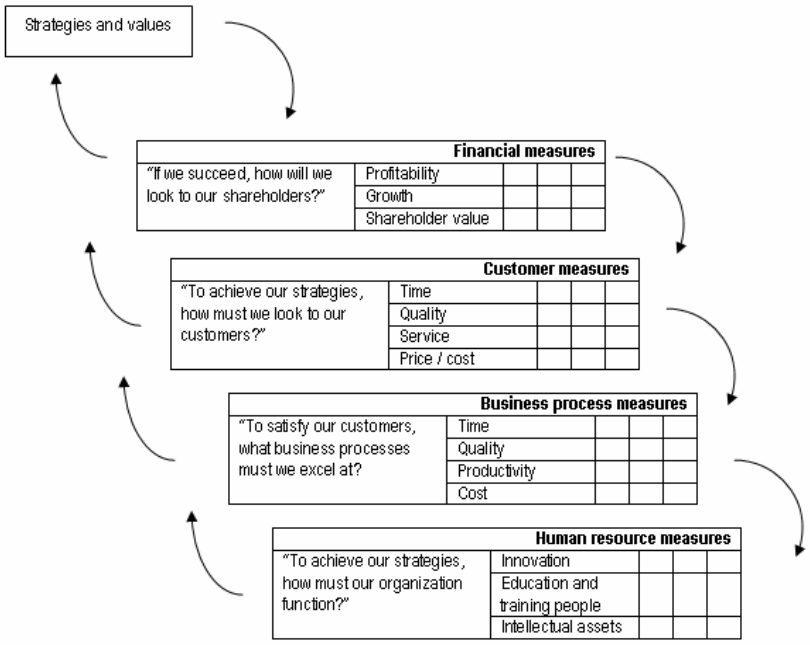


Figure 5: Maisel's balanced scorecard model (Maisel 1992)

Instead of the learning and growth perspective in the balanced scorecard of Kaplan & Norton, Maisel uses a human-resource perspective in his model (see Figure 5). Here he measures innovation as well as factors like education and training, product development, core competencies, and corporate culture. The reason for using a separate employee perspective is that management should be attentive to, and should measure, the effectiveness of an organization and its people. Maisel's balanced scorecard and the steps identified to translate strategy into performance measures shares great resemblance with the balanced scorecard of Kaplan & Norton.

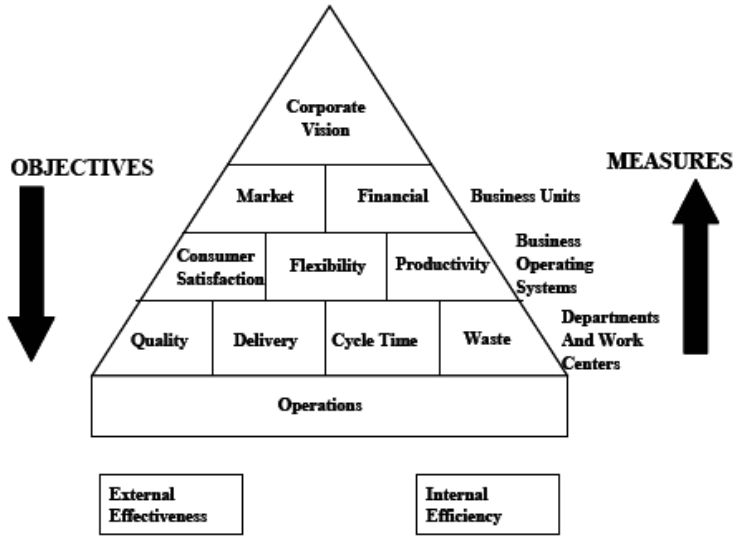


Figure 6: The performance pyramid (McNair et al. 1990).

McNair et al. developed the performance pyramid (McNair et al. 1990), outlined in Figure 6. The basic principle is a customer oriented model linked to the organization's overall strategy, with financial measures supplemented by several other non-financial key ratios. The performance pyramid shows an organization at four different levels and provides a structure for a two-way communication system which is needed to institute the organization's vision at the various levels of the organization. Objectives and measures become links between the organization's strategy and its activities. Objectives are translated downward through the organization and measures are translated upward. Operational measures lower down are linked to financial measures higher up. This gives management the ability to see what underlies the financial measures and what drives them.

Adams and Roberts developed effective progress and performance measurement, EP^2M (Adams & Roberts 1993).

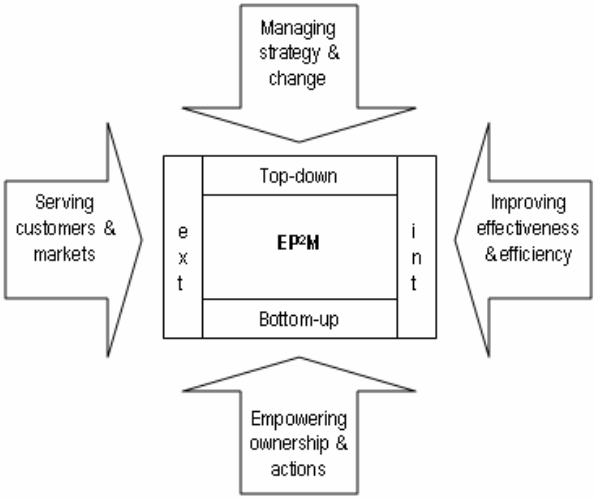


Figure 7: effective progress and performance measurement (Adams & Roberts 1993).

The EP^2M model (see Figure 7) measures an organization in four areas:

1) External measures; serving customers and markets.
2) Internal measures; improving effectiveness and efficiency.
3) Top-down measures; breaking the overall strategy down and speeding up the process of change.
4) Bottom-up measures; empowering ownership and enhancing freedom of action.

According to Adams and Roberts, the purpose of a measurement system is not only to implement the organization's strategy, but also to foster a culture in which constant change is a normal way of life. Effective measures should permit review and provide decision makers and strategic planners with rapid feedback.

2.1.3 Model selection

The balanced scorecard by Kaplan & Norton, the balanced scorecard by Maisel, the performance pyramid by McNair et al. and the EP^2M model by Adams & Roberts all share the concept that the performance of an organization has to be measured from four different perspectives and should not be limited to financial measures. The measures identified in these perspectives have to be aligned with the strategy of the organization. The specific perspectives vary per model and the different models all have their own approach in how to translate strategy to concrete performance measures.

Of the four different models, the balanced scorecard by Kaplan & Norton provides the most comprehensive set of guidelines on how to define and implement the model. It clearly defines a step by step approach to translate strategy into performance measures. The strategy map, the starting point of this translation, is easy to explain to management and can be used in interviews and discussions to identify objectives in the four different perspectives.

eBuddy management is familiar with the balanced scorecard of Kaplan & Norton, from previous working experience. This helps in defining the contents of the scorecard together with management, because they already understand the concept. Furthermore, it helps in gaining management support and drive to implement and use an already familiar model in their organization.

The balanced scorecard is the most discussed model in literature. Its high-profile in management seminars and academic debates has placed it alongside approaches such as Activity Based Costing and Total Quality Management in terms of industry and literary attention. Mooraj et al. (Mooraj et al. 1999) discussed available literature and case studies on the subject and drew the conclusion that the balanced scorecard is a "necessary good" for today's organizations.

The balanced scorecard is also the most implemented model in organizations. Silk indicates that 60% of the Fortune 1000 companies, the largest companies in the US, have experimented with the balanced scorecard (Silk 1998). Bourguignon et al. researched that 20% of all companies in the UK, Germany and Italy are aimed at implementing the balanced scorecard and that more then 70% of them is familiar with the scorecard (Bourguignon et al. 2004).

The balanced scorecard of Kaplan & Norton is selected as model for application in this research based on a fit with the research focus and scope, a comprehensive set of guidelines for definition and implementation of strategic performance measures, the fact that eBuddy management is familiar with the model and the extensive literature attention that supports the balanced scorecard.

2.2 Balanced scorecard roadmap

This section describes a roadmap for the definition and implementation of strategic performance measurement using the balanced scorecard from best practices. The focus lies on organizations that also implemented the balanced scorecard and to translate their lessons learned in recommendations for the definition and implementation of strategic performance measurement with the balanced scorecard within eBuddy.

2.2.1 Assiri et al.'s roadmap

Assiri et al. recently carried out an exploratory research on the experiences of organizations with the implementation of the balanced scorecard (Assiri et al. 2006). Their research consisted of an analysis of case studies of balanced scorecard implementations in organizations presented in literature and an exploratory global survey of 103 firms in 25 countries that have already implemented or are in the process of implementing the balanced scorecard. The research focuses on the best practices and identifies a roadmap for the implementation of the balanced scorecard in an organization. The firms researched are of different size, location and sectors, according Assiri et al. their implementation roadmap is relevant for companies in general, regardless of location, sector and size.

When comparing the researched firms with eBuddy, of the 103 firms 25% were located in Europe, 5% had less than 100 employees and 3% were in the telecommunication sector (no firms were specifically identified in the internet sector). The location of eBuddy is well represented in the researched firms, but the company size and sector are not. However, the roadmap identified by Assiri et al. is currently the most comprehensive available in literature researching the best practice experiences from a large number of companies differing in location, sector and size. Furthermore, the research has been carried out recently, which indicates that the results are applicable to the current organizational environment. Currently, no roadmap for balanced scorecard definition and implementation for companies in the internet sector is available in literature.

Although there is no 100% guarantee that the Aissir et al. roadmap is applicable to a small internet firm like eBuddy, it is used as a guideline within this research for the identification and implementation of the strategic performance measures identified by the application of the balanced scorecard. The alternative of not using such a roadmap would neglect all the lessons learned by organizations that already carried out a process similar to objectives of this research. The application of this roadmap and possible difficulties faced due to company size and sector are evaluated at the end of this research.

2.2.2 Best practice definition and implementation roadmap

The roadmap from Assiri et al. contains 27 success factors which are expected to influence the balanced scorecard implementation (Assiri et al. 2006), see Appendix 3. Those factors are divided in three levels; dominant, main and supporting factors. For each factor, specific implementation guidelines are defined.

Dominant factors are those expected to play a significant role in the balanced scorecard implementation. Without those factors, it is very difficult to implement the balanced scorecard successfully.

Main factors are less critical than the dominant factors. Main factors are important in each step of a balanced scorecard implementation and are sub-divided in six categories; planning, development, implementation, sustainability, benefits realization and learning and innovation.

Supporting factors are those factors less critically than dominant and main factors of balanced scorecard implementation. However, these factors are significant to support the balanced scorecard.

The 27 dominant, main and supporting success factors are outlined in Appendix 3. The implementation of balanced scorecard within this research scope focuses on implementation for eBuddy management. The best practice definition and implementation roadmap also focuses on implementation through an organization as a whole.

The success factors that are recommendations for possible future implementation throughout the whole organization are:

- Communicate balanced scorecard (4);
- Stimulate culture (6);
- Training[8] (8);
- Rolling out implementation plan (12);
- Cascading the balanced scorecard (13);
- Learning and innovation (22);
- Self-assessment (24).

These factors are excluded from the eBuddy definition and implementation roadmap. The other factors define the roadmap for eBuddy that will be applied for the definition and implementation of the balanced scorecard.

2.2.3 eBuddy balanced scorecard roadmap

The application of Assiri et al.'s roadmap defines a roadmap for the definition and implementation of a balanced scorecard within eBuddy, which will be applied in this research. The eBuddy balanced scorecard roadmap is outlined in Table 2. This table also indicates in which chapter of this thesis each factor of the roadmap is discussed.

eBuddy balanced scorecard roadmap		
Dominant factors		
Identify balanced scorecard perspectives	Choose perspectives that suit the organization's strategy and objectives. Between 3 and 5 perspectives that cover all aspects and activities of the organization. Kaplan & Norton's four perspectives have been found to be appropriate for most companies and industries	Chapter 3
Create balanced scorecard team	Assign team for implementation consisting of members with various skills, knowledge and are from different departments.	Chapter 3
Gain executives and seniors managers' commitment	Acquire management commitment and responsibility for implementation. Management must be involved at every step in the implementation and show their commitment.	Chapter 3
Main factors – planning		
Initial plan	Before implementation, sources of performance data should be identified.	Chapter 6
Main factors – development		
Mission, values, vision, strategy	A clear mission, values, vision and strategy should be in place before identifying the balanced scorecard. The balanced scorecard concerns the implementation of already planned strategies.	Chapter 3
Set objectives and measures	All objectives in the balanced scorecard have to be derived from the organization's strategy.	Chapter 4,5

[8] Training is not a success factor for current implementation, since the users of the balanced scorecard, management, were involved at the definition of the scorecard and are already familiar with the concept.

KPI's	Key performance indicators should be defined by the balanced scorecard.	Chapter 5
Cause-and-effect linkage	Establish relationships and linkages between KPI's, which are supported by the balanced scorecard definition of cause-and-effect relationships in the strategy map.	Chapter 4
Main factors – implementation		
Information system design	An information system that presents and communicates the balanced scorecard through the organization should be developed.	Chapter 6
Main factors – sustainability		
Automating the balanced scorecard	Automate the balanced scorecard and choose the most appropriate software.	Chapter 6
Updating balanced scorecard measures and linking them with rewards	Rewards and bonuses for employees have to be tied to the results of the balanced scorecard measures. The measures have to be updated to changed internal or external circumstances and reviewed at least once a year.	Chapter 7
Corporate alignment	Strategic initiatives should be aligned with strategic objectives identified in the balanced scorecard.	Chapter 7
Benchmarking[9]	Compare balanced scorecard results with performance of competitors and with own past performance.	Chapter 6
Main factors - benefits realization		
Regular reporting	Use the balanced scorecard for regular reporting on an identified timeframe.	Chapter 6
Measurements assessment	The strategic performance of eBuddy should be assessed from results on measures in the balanced scorecard.	Chapter 6
Problem solving and action planning	Use balanced scorecard measures in problem-solving processes and communication of problems.	Chapter 7
Supporting factors		
Integration	The balanced scorecard should be integrated in the strategic management system.	Chapter 6
Finalize measures	The balanced scorecard team has to narrow the set of identified strategic performance measures and choose those that help the organization to execute its strategy. In general, an organization has to be aware of the number of measures chosen. The key to determine the organizations balanced scorecard measures is assuring an adequate description of the organizations strategy through its balanced scorecard perspectives.	Chapter 5
Fine tuning and refining	Communicate balanced scorecard results throughout the organization and compare current performance with past results.	Chapter 6
Finalize balanced scorecard plan	Specify precise meanings of the strategic performance measures.	Chapter 6

Table 2: eBuddy balanced scorecard roadmap

The dominant factors are crucial for the implementation of the scorecard. The main factors outline important steps to take in each phase of the definition and implementation process, from planning, development, implementation and sustainability to benefits realization. The supporting factors have a positive influence on the final implementation of the balanced scorecard within eBuddy.

This roadmap is used as a guideline through each step of this research. At the end of each chapter the steps taken in the roadmap are evaluated.

[9] Benchmarking is an ongoing process of measuring and improving products, services and practices against the best that can be identified worldwide (McGaughey 2002).

2.3 Customer satisfaction model

This section describes a customer[10] satisfaction model to define the contents and determinants of product user satisfaction for eBuddy. Figure 8 shows the customer satisfaction model developed by Fornell (Fornell et al. 1996). Fornell's model expresses customer satisfaction as a result of three elements: perceived quality, expectations and perceived value.

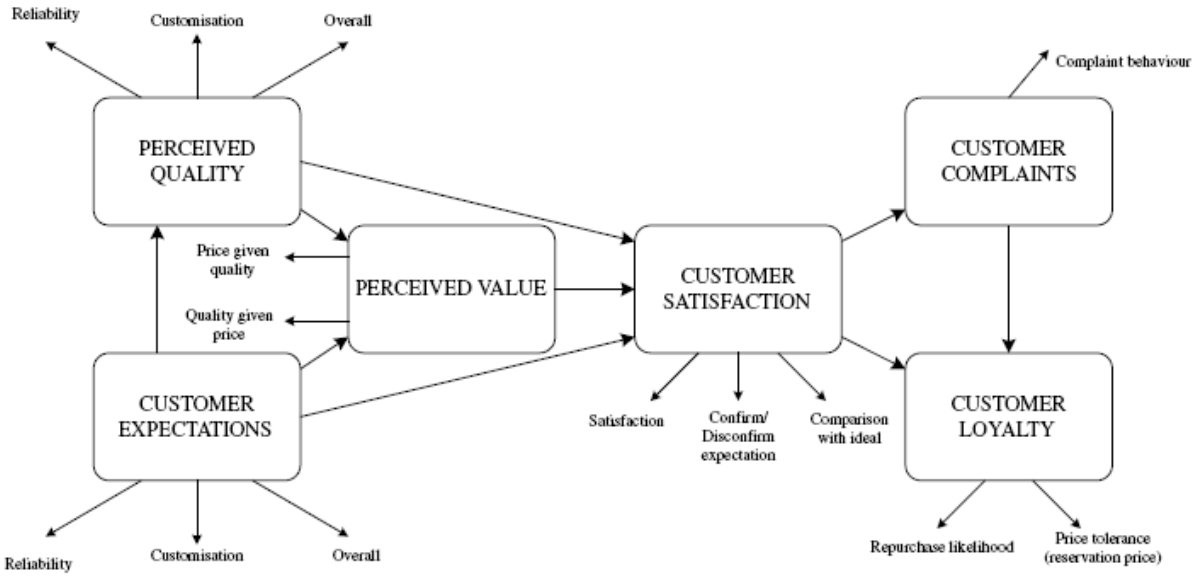


Figure 8: Fornell's customer satisfaction model (Fornell et al. 1996)

Perceived quality is defined by reliability, the degree in which a firm's offer is reliable, and customization, the degree in which a firm's product offer is customized to meet heterogeneous customer needs. Perceived value adds price information to the model and is defined by price given quality and quality given price. The third determinant of customer satisfaction, customer expectations, represents the customer's expectations both from prior experience with the firms offering, including perceived word-of-mouth and a forecast of a customer's forecast of the firm's ability to deliver quality. Fornell's model also states that there is a relationship between customer satisfaction and customer loyalty.

2.3.1 Selection of Fornell's model

Fornell's customer satisfaction model is selected for application to eBuddy within this research because research from several authors states that this model can be applied for products in the internet and mobile services market, which matches the markets of eBuddy's products.

Fornell's model is underlined by several authors of research within different target areas, who agree on the contents of his customer satisfaction model. Furthermore Lin, Evanschitzky et al. and Turel & Serenko state that this model can also be applied for products in internet and mobile services markets (Lin 2003), (Evanschitzky et al. 2004), (Turel & Serenko 2004).

Woodruff's research on the impact of perceived customer value on creating competitive advantage underlines the fact that perceived value is an important contributor to customer satisfaction (Woodruff 1997). Lin's research on customer satisfaction in an e-commerce setting also underlines Fornell's model by stating that customer value is the total amount of benefits a customer expects from a given product or service and customer satisfaction is dependent on the comparison of experiencing a service quality with what was expected (Lin 2003).

[10] Customers for eBuddy are its product users. The product user satisfaction is called customer satisfaction in Fornell's model.

Evanschitzky et al. researched customer satisfaction in an online context and agree on the relationship between customer satisfaction and loyalty by stating that customer satisfaction in an online context is a primary predictor of customer loyalty (Evanschitzky et al. 2004). Turel & Serenko researched the possibility to apply Fornell's model for the area of mobile telecommunication services and conclude that his model actually adequately describes the perceptions and behaviour of mobile phone users (Turel & Serenko 2004).

2.4 Assessment of environmental uncertainty

The section describes the selected literature model to define eBuddy's level of environmental uncertainty. Daft developed a framework for assessing environmental uncertainty (Daft 2001), which is presented in Table 3.

Stable	Simple + Stable = Low uncertainty 1. Small number of external elements and elements are similar 2. Elements remain the same or change slowly	Complex + Stable = Low-Moderate uncertainty 1. Large number of external elements and elements are dissimilar 2. Elements remain the same or change slowly
Environmental change		
	Simple + Unstable = High-Moderate uncertainty 1. Small number of external elements and elements are similar 2. Elements change frequently and unpredictable	Complex + Unstable = High uncertainty 1. Large number of external elements and elements are dissimilar 2. Elements change frequently and unpredictable
Unstable		
	Simple	Environmental complexity *Complex*

Table 3: Framework for assessing environmental uncertainty (Daft 2001).

This framework defines the level of environmental uncertainty according to the changes in the environment and the environmental complexity. If the elements (customers, competitors, suppliers, legislation, economy, etc) in the external environment remain the same or change slowly, this creates a sTable level of environmental change. If they change frequent and unpredictable, this creates an unstable level. If there are a small number of external elements and elements are similar, the level of environmental complexity is simple. If there are a large number of elements and elements are dissimilar, this level is complex.

Daft's model is selected for application to eBuddy within this research because the model is stated to be generic for assessing the level of environmental uncertainty for any company, independent of size and sector (Daft 2001).

3 Management interviews

Chapter 2 described the balanced scorecard of Kaplan & Norton (Kaplan & Norton 1996) as the selected literature model to define strategic performance measures for eBuddy. The first step in defining a balanced scored is to translate a company's strategy in objectives in each of the four perspectives in the scorecard, linked by cause-and-effect relationships in a strategy map (see Section 2.1.1). This chapter will describe the gathering of information needed to define eBuddy's strategy map.

Each objective and cause-and-effect relationship in a strategy map has to be linked to the company's strategy (Kaplan & Norton 1996). The definition of a strategy map therefore is a process which acquires involvement of management. This chapter will describe the chosen approach in defining eBuddy's strategy map, the identified objectives and relationships that will be translated in a strategy map in Chapter 4.

3.1 Approach

The main stakeholders in this research are eBuddy's CEO (Chief Executive Officer) and COO (Chief Operational Officer). These stakeholders are both the users of the balanced scorecard after implementation as well as the creators of the company strategy. The approach in acquiring management commitment in the strategy map definition process is by conducting several management interviews with attendance of both eBuddy's CEO and COO. To assure that the strategy map will reflect the strategic objectives of the company as a whole, and not of the possible different objectives of the CEO and COO, both persons were required to attend the interviews together.

The management interviews were divided in two sessions. The first session focused on gaining insight on the motives and vision behind the identified strategy. The motives and vision behind the strategy will give insight in managements long-term goals for the company and therefore assist in defining suiTable objectives in each of the four perspectives in the scorecard. The second session focused on gaining management's vision on suiTable objectives and cause-and-effect relationships in the four perspectives.

The results of both interview sessions are evaluated. This evaluation means that for each statement from the interview sessions that impacts the strategy map, is indicated if this statement is based on a vision or assumption by management, is supported by a literature model or can be supported by past experience. This step provides a more thorough foundation on the objectives and cause-and-effect relationships that define the strategy map. The creation of this strategy map is the main step in identifying a balanced scorecard (Kaplan & Norton 1996), therefore an evaluation of the interview results is desirable. With the results from the interview sessions and the evaluation, the eBuddy strategy map is defined in Chapter 4.

3.2 Interview results

This section highlights the results from the two interview sessions with eBuddy's CEO and COO. Results from these interviews that impact the definition of the balanced scorecard are split in eBuddy's strategy, determinants of company value, the acquisition of product users, the generation of revenue, the added value of the products, and the environmental uncertainty of eBuddy. Each of these subjects is discussed separately in Sections 3.2.1 to 3.2.6.

3.2.1 eBuddy's strategy

eBuddy's strategy is defined based on Daft's definition of a company's strategy (Daft 2000). According to Daft, there are three levels of strategy;

1) Corporate-level strategy: The level of strategy concerned with the question "What business are we in?" and pertains to the organization as a whole.
2) Business-level strategy: The level of strategy concerned with the question "How do we compete?" and pertains to each business unit or product line within the organization.
3) Functional-level strategy: The level of strategy concerned with the question "How do we support the business level strategy?" and pertains to all of the organization's major departments.

eBuddy's corporate-level strategy is to "*Offer simple to use, reliable products with market unique features that provide instant messaging for everyone everywhere* ". eBuddy's vision is that instant messaging should be available for everyone, irrespective of which hardware device, software and instant messaging network a user has access to. By applying its corporate-level strategy, eBuddy management wants to build a growing company with a growing company value, to satisfy its shareholders. Management believes that the number of product users, the revenue generated and the amount of media coverage are the determinants of company value for eBuddy. These determinants influence strategic decision making and impact the business-level strategies.

eBuddy, with thirty employees is not divided in either business units or departments. However, clearly divided teams with their own targets, tasks and responsibilities are identified among staff. These teams function as business units for eBuddy and have their individual business-level strategy. Because no departments exist, eBuddy's company strategy is defined by the corporate, - and business-level strategies. eBuddy is divided in five business units; product management, development, operations, sales and marketing.

Product management translates the corporate-level strategy into products that offer instant messaging through all major instant messaging networks on any computer, mobile phone, gaming device or television with an internet connection. eBuddy focuses on developing products with these characteristics that answer a market need in markets with high growth potential. The focus on high growth potential is based on management's believe that the number of product users is one of the three determinants of company value for eBuddy. Product management offers products to the market by identifying and implementing marketing strategies and setting up partnerships for product distribution.

Development creates eBuddy's products by software development. In order to implement the corporate-level strategy, eBuddy requires knowledge and experience in the fields of instant messaging networks, hardware devices capable of connection to the internet and software developing technologies. The main focus of the development business unit is to gain a superior level of this knowledge and experience in-house.

Operations supports all hardware and software systems that facilitate the use of eBuddy's products. To implement the corporate-level strategy, operations focuses on assuring that eBuddy's products are ready to use at all times. Therefore, operation's strategy is to focus on operational excellence.

Sales generates eBuddy's revenue by selling online advertisement publishing within its products. Sales' strategy is to focus on maximization of the revenue generated, without annoying the product users. This is done by targeting advertisements to strictly defined segmentations within the total user base of eBuddy's products. This targeting is aimed at presenting advertisements to product users that fit their interests. The focus on revenue maximization is based on management's believe that the revenue generated is one of the three determinants of company value for eBuddy.

Marketing promotes eBuddy's products to the target markets and eBuddy as a company to the media. eBuddy's strategy in acquiring new users in the target markets is by using viral marketing[11]. The marketing business unit's strategy is to increase the level of viral marketing and media coverage. The increase of viral marketing is targeted at acquiring more product users[12] and the increase of media coverage to create a positive image of eBuddy as a company with possible partners and investors. The focus on increase of viral marketing and media coverage is based on management's believe that the number of users and the level of media coverage are two of the three determinants of company value for eBuddy.

3.2.2 Determinants of company value

By applying its corporate-level strategy, eBuddy management wants to build a growing company with a growing company value, to satisfy its shareholders. This section outlines management's vision behind the definition of the determinants of company value for eBuddy. The identified determinants of company value for eBuddy are the number of product users, the revenue generated and the media coverage.

According to management, the number of product users determines the success in offering products to the market and indicates the level to which they fulfil a market need. The number can be compared with competitors and overall market size to calculate the market share of the products. Market share defines the level in which eBuddy is reaching product users compared with competitors. Furthermore, the number of product users influences the potential number of users for new eBuddy products. When introducing new products, eBuddy can offer these first to its current product users in order to reach potential users of new products that are already familiar with the company and its current products.

The number of product users is one of the determinants of company value for eBuddy by defining the success in offering products, market share and offering potential for acquiring users of new products.

eBuddy generates revenue by publishing online advertisements to its product users. These advertisements generate revenue by a fee that eBuddy receives per number of advertisements that are published or the number of clicks on advertisements. Revenue defines eBuddy's capability to generate income from its product users. This capability is crucial for eBuddy in creating a financial stable and profit making company. Management does not want to be completely dependent on external funding, which increases the importance of revenue generating capability.

[11] Viral marketing uses electronic communications to trigger brand messages throughout a widespread network of buyers (Dobele et al. 2005). It is the word-of-mouth applied to the internet (Moore 2003) and exploits existing social networks by encouraging customers to share product information with their friends (Leskovec et al. 2006).

[12] Because viral marketing is based on voluntary promotion rather than a paid testimonial or a mass ad campaign it may be viewed more favorably by the recipient. Furthermore, a person that recommends a product will be more likely to know which of his friends, family members, and work colleagues have similar interests and thus creates effective targeting (Dobele et al. 2005).

Currently, this capability is a largely discussed topic among internet companies and their shareholders. Cases like Youtube, the video sharing website that was acquired by Google for 1.65 billion dollars without ever making any revenue and eBuddy's own major competitor Meebo that received 12.5 million dollars external funding without making any revenue, strengthen the focus on revenue generating capability. No commercial company can stay to exist without generating revenue at some point in time. eBuddy's management therefore sees its capability to generate revenue from its product users as one of the determinants of company value for eBuddy.

Media coverage is the mentioning of eBuddy as a company of one of its products in the press. This media coverage influences the image of eBuddy as a company to possible partners, employees, investors and competitors. Management believes that a high level of media coverage will assist eBuddy in acquiring partnerships, employees and investors. Therefore, media coverage is one of the determinants of company value for eBuddy.

Management believes that a combination of the three determinants together and not one separately, determine company value for eBuddy. Management sees a big challenge in dividing management attention and resources between different objectives to positively impact these three different determinants, in order to optimally grow the company value.

3.2.3 Acquisition of product users

eBuddy acquires product users by viral marketing, which is implemented in four different ways;

1) On every chat conversation started by an eBuddy product user, an automated instant message is sent to the receiver promoting eBuddy. See Appendix 4 for an example;
2) The status message[13] of an eBuddy product user shows that this person is using eBuddy to all his contacts that are also using eBuddy. See Appendix 4 for an example;
3) Product users recommend eBuddy products to their friends, family and colleagues through chat conversations;
4) Product users refer to eBuddy on their blogs[14].

To acquire product users, management wants to increase its level of viral marketing. This level means the number of exposures of the viral marketing messages. Based on the four mentioned ways on which eBuddy implements viral marketing, the following actions will lead to an increased level of viral marketing:

1) Increase the level of product usage by product users:
   Increased product usage by product users means an increase of the duration per usage, intensity of use per usage and the number of times usage of eBuddy's products per user. An increase in product usage will increase the exposure of above mentioned automated promotional instant messages and promotional status messages.
2) Increase word-of-mouth recommendations product users do about eBuddy:
   If current product users recommend eBuddy more often in chat conversations, the number of viral marketing messages will increase.
3) Increase references to eBuddy in blogs by product users:
   If current product users refer to eBuddy more often in their blogs, the number of viral marketing messages increases.

[13] A status message is a function of instant messaging applications whereby a user posts a message that appears automatically to all his contacts. Status messages often contain a description of if the person is available for instant messaging conversations at the moment or what his is doing.
[14] A blog (short for web log) is a website where entries are made and displayed in a reverse chronological order. Blogs provide commentary or news on a particular subject, such as food, politics, or local news; some function as more personal online diaries (Wikipedia blog 2007).

These three actions require current product users to be willing to increase their usage of the products and voluntary promote eBuddy by word-of-mouth[15]. Management's wants to achieve this by increasing product user satisfaction. According to management increased product user satisfaction will lead to an increase of product usage and word-of-mouth.

3.2.4 Revenue generation

eBuddy generates revenue by publishing online advertisements to its product users and receiving a fee per number of advertisements published or the number of clicks on advertisements. Management indicates the revenue generated is dependent on the number of product users, the level of product usage and the amount of advertisements sold. The number of product users impacts the number of advertisements published and the number of possible clicks on advertisements. If the number of product users increases, the number of advertisements published and the number of clicks on advertisements increase, according to management. The same holds for the level of product usage. If this level increases, the number of advertisements published and the number of clicks on advertisements increase, thereby increasing revenue.

The number of advertisements sold impacts the generated revenue. eBuddy can publish a certain maximum amount of advertisements, dependent on the number of product users and the level of product usage. When the sold advertisements do not reach this maximum, eBuddy publishes own promotional advertisements, that do not generate revenue. An increase of the number of advertisements sold increases the generated revenue.

3.2.5 Added value of eBuddy products

eBuddy management believes eBuddy's products deliver added value for product users and fulfill a market need by making instant messaging accessible simple, reliable and by offering market unique product features. eBuddy focuses on developing products in the so called "KISS" principle, which stands for "Keep It Sweet and Simple". The added value from the focus on simple products lies in the fact that product users can use instant messaging wherever they want, regardless of the type of computer of mobile phone they have access to and on the user interface, which is focused on simple and easy use.

The added value on a reliable product lies in the operational performance that focuses on making the product available at all times. Management believes eBuddy products provide added value for product users by offering instant messaging features that are unique compared to competitors in the market. Furthermore, when developing these features, eBuddy focuses on creating lock-in, i.e., offering features that prevent product users from leaving.

3.2.6 Environmental uncertainty

eBuddy management indicates that since the company start-up, it is facing a highly level of environmental uncertainty. Environmental uncertainty means that decision makers do not have sufficient information about environmental factors, and they have a difficult time predicting external changes (Daft 2001).

New competitors enter the market in a fast and continues pace which requires eBuddy to closely monitor these competitors and their products, especially since product users can easily switch to other parties. This highly competitive market does not limit itself to acquiring product users, but extends to acquiring employees.

[15] Word-of-mouth refers to recommendation of eBuddy by product users in chat conversations.

The information technology sector is known for its continuous development and introduction of new technology. eBuddy has to follow these developments closely and assure that a high level of technical knowledge and experience is in-house in order to put new possibilities of emerging information technology to work in new or improved products. The highly competitive market strengthens the importance of this required knowledge and experience. Management indicates that this knowledge and experience is a crucial company asset and therefore, development of products in-house is preferred as opposed to outsourcing.

For offering its products, eBuddy is dependent on the major worldwide instant messaging networks. eBuddy has to follow their product developments and translate these in required developments within its own products. The instant messaging networks do not have a formal relationship with eBuddy and do not provide information on upcoming new or changed products. This presents eBuddy with the challenge to closely monitor the actions of all major and new emerging instant messaging networks and act upon them. Furthermore, these instant messaging networks are also offering products that compete with eBuddy's products.

eBuddy is also dependent on the providers of internet worldwide. Its products are accessible through the networks of internet, telecom and television providers. New products and services offered by these providers can create new product possibilities for eBuddy. Therefore, eBuddy has to closely monitor and act on developments of these providers worldwide.

eBuddy's products are accessible for product users through hardware devices capable of connection to the internet, such as computers, mobile phones, gaming devices and televisions. New devices offered to the market by hardware suppliers can create new product possibilities for eBuddy. Therefore, eBuddy has to closely monitor and act on developments of these suppliers worldwide.

3.3 Evaluation of interview results

Before the interview results will be applied in the definition of a strategy map, the statements from the interview sessions will be evaluated. This evaluation means that for each conclusion of the interview statement that impacts the strategy map, is indicated if the conclusion is based on a vision or assumption by management, is supported by a literature model or can be supported by past experience. This step provides a more thorough foundation on the different objectives and cause-and-effect relationships that define the strategy map.

3.3.1 Determinants of company value

Management believes the determinants of company value for eBuddy are the number of product users, the revenue generated and the media coverage. Company value is determined by a combination of these three determinants. Both assumptions will be accepted for developing eBuddy's strategy map and final balanced scorecard. Extensive research attention exists about company valuation. Identifying determinants of company value for eBuddy by applying literature models, however, would request a separate research and falls out of this research scope. Furthermore, these determinants are part of eBuddy's strategy. The target of this research is to define strategic performance measures which reflect the company's strategy and will be used by management. Since management itself identified the determinants for company value which already affect current strategic decision making, strategy map should reflect these determinants.

3.3.2 Product user satisfaction

Management believes that increasing product user satisfaction will lead to an increase of product usage and word-of-mouth promotion. To translate this statement to objectives and cause-and-effect relationships in the strategy map, Fornell's customer satisfaction model is selected from available literature, see Section 2.3.

Fornell states that high levels of customer satisfaction should produce favourable word-of-mouth (Fornell 1992). Anderson researched the relationship between customer satisfaction and word-of-mouth behaviour and agrees that there is a relationship between customer satisfaction and word-of-mouth (Anderson 1998). Furthermore, Anderson concludes that dissatisfied customers do engage in greater word-of-mouth, negative, than satisfied ones. Fornell's customer satisfaction model and Andersons research agree on eBuddy management's believe that increasing product user satisfaction will lead to an increase word-of-mouth promotion. Anderson's statement that dissatisfied customers do engage in greater word-of-mouth, negative, than satisfied ones, strengthens the importance of a high level of product user satisfaction.

Immediate consequences of increased customer satisfaction are decreased customer complaints and increased customer loyalty (Fornell et al. 1996). This agrees on management's belief that increasing product user satisfaction will lead to an increase of product usage.

Fornell's customer satisfaction model agrees on both management statements on product user satisfaction and therefore is applied for the definition of eBuddy's strategy map (see Section 4.4).

3.3.3 Revenue generation

Management believes the revenue generated is dependent on the number of product users, the level of product usage and the number of advertisements sold.

The relationship between revenue and number of product users is supported by past experience, eBuddy constantly sees its revenue increase when the number of product users increases. Support for this statement can be found in a comparison of the revenue generated per month and the number of product users in this month. Figure 9 shows this comparison for The United Kingdom. This comparison has to be done for one specific country, since the number of advertisements sold varies substantial per country. Therefore, a comparison on all countries and total product users would be influenced by this variation. Figure 9 supports the relationship between revenue and number of product users. The graph clearly indicates that revenue and the number of product users follow a comparable trend.

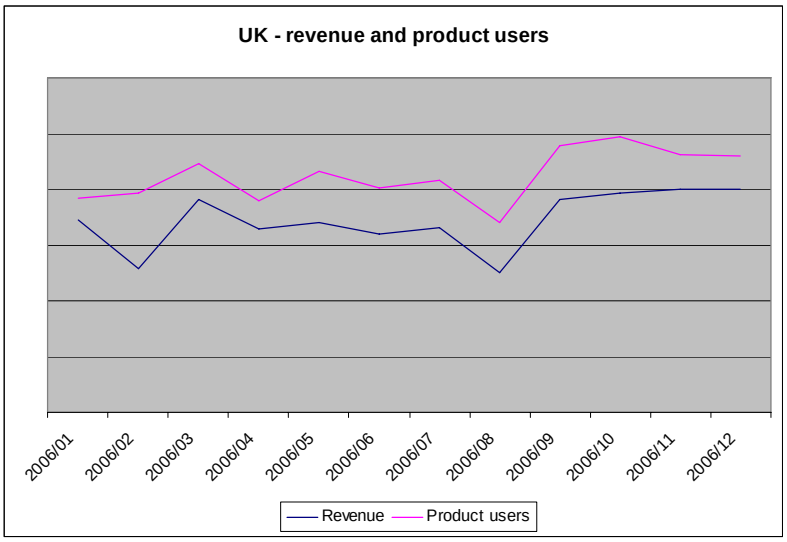


Figure 9: Revenue and product users, UK[16]

The relationship between revenue and level of product usage can currently not be supported by in-house data on past experience, since the level of product usage per product user is not available in in-house data. Furthermore, to support this relationship by defining a correlation between the level of product usage and revenue would require a separate research and falls out of research scope. Therefore, this relationship will be translated in the strategy map based on management's belief.

The relationship between revenue and the number of advertisements sold is supported by the fact that the number of advertisements sold is the direct source of eBuddy's revenue.

[16] This Figure does not show revenue Figures due to confidentiality.

3.3.4 Added value of eBuddy products

Management believes eBuddy's products deliver added value for product users and fulfill a market need by making instant messaging accessible simple, reliable and by offering market unique product features. Supporting this added value for product users and market need would be a market research that falls out of this research scope. However, since its introduction eBuddy has developed products from this belief and the number of monthly product users has shown a growth trend, see Figure 10. This growth trend supports the factors of added value and fulfillment of a market need according to management. Therefore, the strategy map will reflect these assumptions.

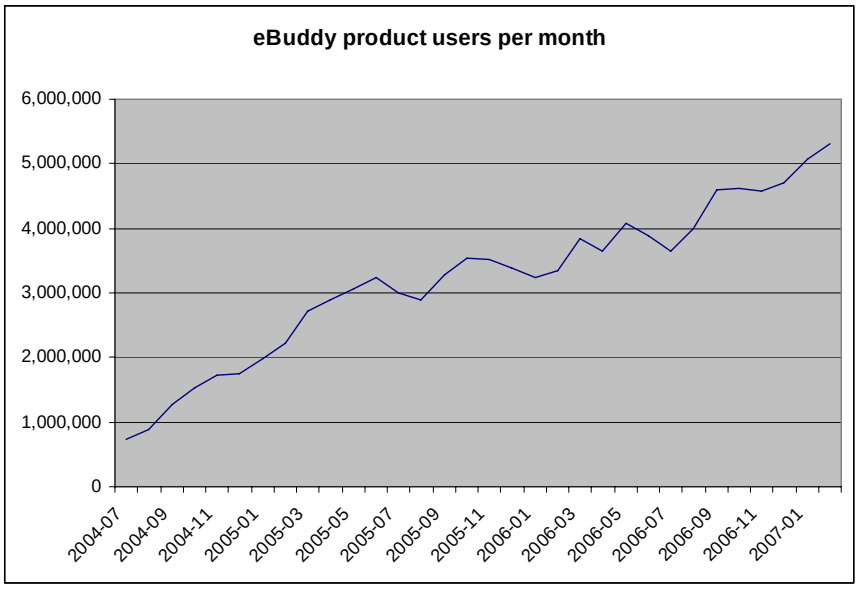


Figure 10: eBuddy product users per month

3.3.5 Environmental uncertainty

According to management, eBuddy faces a high level of environmental uncertainty. Daft's framework for assessing the level of environmental uncertainty (see Section 2.4) is applied to evaluate this statement.

For eBuddy, the level of environmental complexity is complex. There are a large number of external elements that have a big influence on eBuddy's environment. These elements consist of:

1) Current and new competitors;
2) The major worldwide instant messaging networks;
3) Worldwide internet, telecom and television providers;
4) Worldwide suppliers of hardware capable of connecting to the internet;
5) Developments in the information technology sector.

These elements are dissimilar since they consist of worldwide competitors, partners, suppliers and an information technology sector.

The level of environmental change for eBuddy is unstable. The elements in the external environment change frequently and unpredictable:

1) New competitors enter the marker on a monthly basis;
2) Instant messaging networks update their products on regular bases and do not inform eBuddy beforehand. Furthermore, they also started offering competing products;
3) The market of internet, telecom and television providers is changing rapidly. Beforehand, these three markets were separated, but currently these are merging into one market where these three services are often offered by a single provider;
4) Developments of hardware devices capable of connecting to the internet follow a rapid pace, especially mobile phones and gaming devices;
5) The information technology sector is known for its rapid development of new technology.

Because of a complex external environment and an unstable environmental change, eBuddy faces a high level of environmental uncertainty. This corresponds with management's vision on the environment. However, the statement of a high level of environmental uncertainty for eBuddy itself has no direct impact on the contents of the strategy map. Management already translated this statement in their corporate- and business level strategy. The fact that the company is facing a high level of environmental uncertainty itself can not identify objectives in the strategy map. These objectives are identified by the corporate- and business-level strategy, that make clear how eBuddy copes with this environmental uncertainty.

3.4 Conclusions

The interview sessions and evaluation of the interview results are aimed at providing a thorough foundation to identify the objectives and cause-and-effect relationships in the strategy map of the balanced scorecard. Table 4 highlights the conclusions made from the interview results and evaluation, and indicates for each conclusion if it is supported by management's vision and assumptions, literature or internal data on past experience.

Conclusion from interview results and evaluation	Supported by
1. eBuddy wants to grow company value.	Management vision
2. The determinants of company value for eBuddy are the number of product users, the revenue generated and the media coverage.	Management vision and assumptions
3. Company value for eBuddy is a combination of the three determinants.	Management vision and assumptions
4. eBuddy wants to increase its level of viral marketing to acquire new product users: a) The level of viral marketing can be increased by increasing product user satisfaction; b) Product user satisfaction can be defined by applying Fornell's customer satisfaction model (Fornell et al. 1996).	Management vision, assumptions and customer satisfaction model
5. eBuddy's revenue is dependent on: a) The number of product users; b) The level of product usage; c) The number of advertisements sold.	 Management assumptions and past experience Management assumptions Management assumptions and past experience

Table 4: Conclusions from interview results and evaluation

The conclusions outlined in Table 4 are applied in the definition of eBuddy's strategy map in Chapter 4.

3.4.1 Balanced scorecard roadmap evaluation

The factors of the balanced scorecard roadmap (as defined in Section 2.2) taken into account by the approach followed for the management interviews are highlighted in Table 5.

Dominant factors	
Identify balanced scorecard perspectives	Kaplan & Norton's four perspectives are used, which have been found to be appropriate for most companies and industries (Assiri et al. 2006). The used standard four perspectives cover all aspects and activities of an organization (Kaplan & Norton 1996).
Create balanced scorecard team	The team consists of management itself, which is the driving force behind the balanced scorecard definition and implementation and they are the users of the scorecard after implementation.
Gain executives and seniors managers' commitment	The need for strategic performance measures was identified by management, which was already familiar with the balanced scorecard. Both CEO and COO were involved in the interview sessions for the definition of the balanced scorecard strategy map.
Main factor – development	
Mission, values, vision, strategy	eBuddy's strategy and management's vision and motivations behind the strategy are clearly defined by the conducted interview sessions and evaluation of the interview results.

Table 5: Balanced scorecard roadmap evaluation

The three dominant factors that are critical for any balanced scorecard definition and implementation are all covered by the management interview approach. The main factor mission, values, vision and strategy which focuses on the development process of a balanced scorecard, is also taken into account by the management interview approach. The next step in the definition of the balanced scorecard is the definition of eBuddy's strategy map, which is outlined in Chapter 4.

4 Definition of eBuddy strategic map

This chapter describes the definition of eBuddy's strategy map. This strategy map is based on the balanced scorecard model (Kaplan & Norton 1996), see Section 2.1.1, and defined according the results from the management interviews and evaluation of the interview results, see Section 3.4. Each of the four perspectives of the strategy map will be discussed top-down, from financial to learning and growth perspective.

Figure 11 presents the defined strategy map as a starting point for the description of its contents in the Sections 4.1 to 4.4, where per section each individual balanced scorecard perspective is discussed. Section 4.5 highlights the conclusions of this chapter and provides an evaluation of the steps taken in the balanced scorecard roadmap.

With the strategy map defined in this chapter, the strategic performance measures for eBuddy can be defined in Chapter 5.

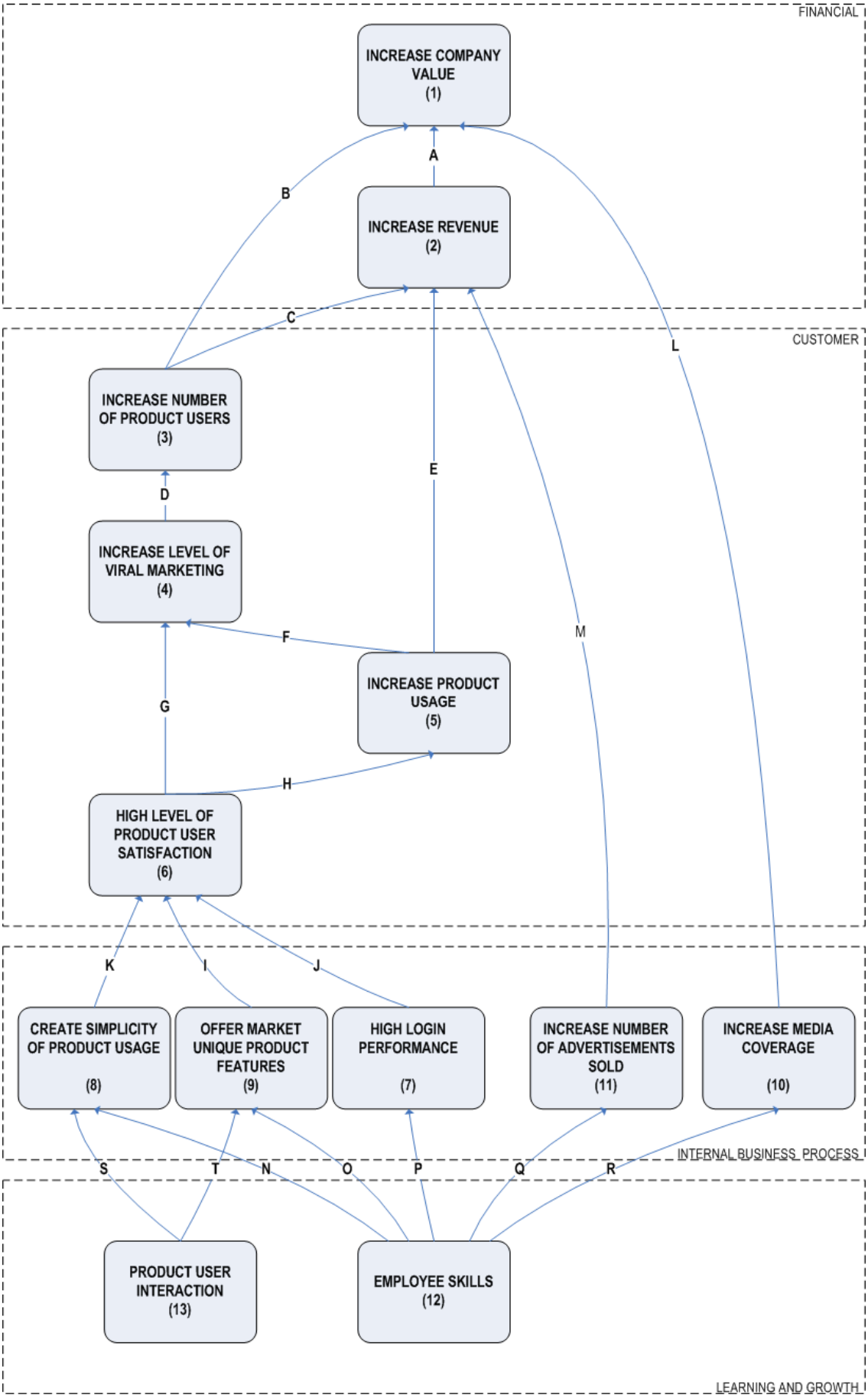


Figure 11: eBuddy strategy map

4.1 Financial perspective

The financial perspective contains objectives that reflect economic consequences of actions already taken (Kaplan & Norton 1996). The first objective in the financial perspective for eBuddy is to *increase company value(1)*[17]. This objective is derived from eBuddy's corporate-level strategy. The second financial objective identified by a cause-and-effect relationship(a)[18] is *increase revenue(2)*, since revenue is a determinant for company value for eBuddy.

The *increase company value(1)* objective creates two additional cause-and-effect relationships that define objectives in the strategy map. The two additional determinants of company value are the number of product users and the amount of media coverage. These determinants will define objectives in the customer and internal business process perspective.

4.2 Customer perspective

The customer perspective contains objectives that reflect how the organization wants to perform to its customers (Kaplan & Norton 1996). These objectives are derived by cause-and-effect relationships with objectives in the financial perspective.

The first objective in the customer perspective is *increase number of product users(3)*. The number of users has a cause-and effect relationship(b) with company value, because it is a determinant of company value. The number of product users also has a cause-and effect relationship(c) with *increase revenue*, because revenue is dependent on the number of users.

The objective, *increase level of viral marketing(4)*, is derived by a cause-and-effect relationship(d) with *increase number of product users*, because eBuddy's business-level strategy for product user acquisition is the use of viral marketing.

The *increase product usage(5)* objective in the customer perspective is determined by the cause-and-effect relationships(e - f) with *increase revenue(2)* and *increase level of viral marketing(4)*, because increased product usage will increase both revenue and the level of viral marketing.

The objective, *high level of product user satisfaction(6)*, is derived by cause-and-effect relationships(g - h) with *increase level of viral marketing* and *increase product usage*, because a high level of product user satisfaction will increase the level of viral marking and the level of product usage.

4.3 Internal business process perspective

The internal business process perspective contains objectives that reflect internal processes required in order for the organization to excel at providing the value expected by the customers both productively and efficiently (Kaplan & Norton 1996). These objectives are derived by cause-and-effect relationships with objectives in the financial and customer perspectives.

The *high level of product user satisfaction(6)* objective in the customer perspective determines objectives in the internal business process perspective by cause-and-effect relationships that are identified by the application of Fornell's customer satisfaction model (Fornell et al. 1996).

[17] Annotated with (1) in Figure 11.
[18] Annotated with (A) in Figure 11.

Section 4.4.1 describes the application of this model to define the determinants for product user satisfaction for eBuddy and Section 4.4.2 describes the usage of these determinants to define the objectives that have a cause-and-effect relationship with gaining a high level of product user satisfaction. Section 4.4.3 and 4.4.4 highlight the objectives to increase media coverage and the number of advertisements sold.

4.3.1 Product user satisfaction

Figure 12 outlines the determinants of customer satisfaction according Fornell's customer satisfaction model (Fornell et al. 1996).

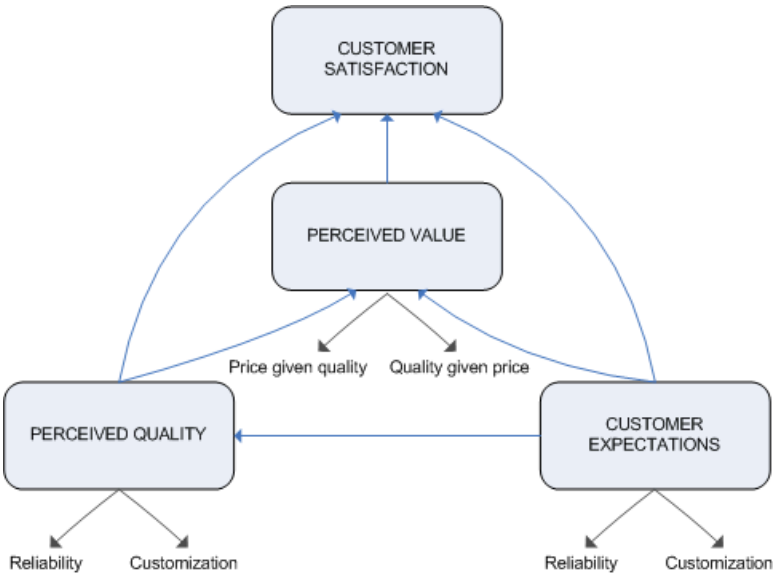


Figure 12: Relationships between customer satisfaction determinants (Fornell et al. 1996).

The determinants of customer satisfaction are perceived value, customer expectations and perceived quality. The level of customer satisfaction dependent on a company's performance on these three determinants (Fornell et al. 1996). The perceived quality is defined by the reliability of the products and the customization, fit with heterogeneous customer needs. The customer expectations are defined by the customer's expectations both from prior experience with its company's product offerings, including perceived word-of-mouth and a customer's forecast of a company's ability to deliver quality. The perceived value of customers is defined by the price given quality and quality given price.

Figure 13 shows the results of the application of this customer satisfaction model to eBuddy.

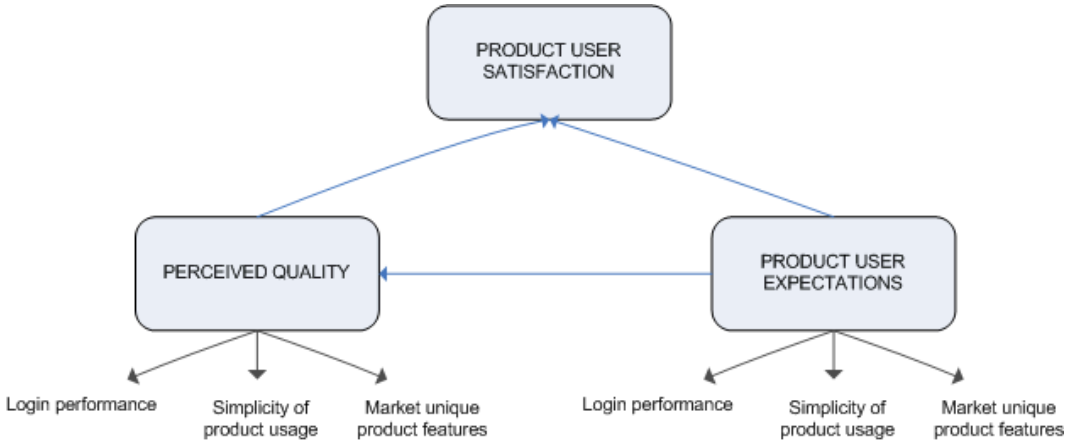


Figure 13: Product user satisfaction model for eBuddy

Currently, eBuddy offers its products free of charge. The perceived value determinant of customer satisfaction can not be applied in the current situation and therefore will be excluded as product user satisfaction determinant for eBuddy. However, if eBuddy in the future will charge fees for its products, this determinant should be included based on relationships shown in Figure 12.

The perceived quality for eBuddy product users is determined by the reliability and customization of the products. The reliability is defined by the login performance of eBuddy's products. Login performance means the extent to which users are able to reach eBuddy's products for usage at any desired moment. The customisation is defined by the fit of eBuddy's product capabilities with the heterogeneous user needs. eBuddy's vision is that its products provide added value and fulfill product user expectations by making instant messaging accessible simple, reliable and by offering market unique product features. The fit with heterogeneous user needs is defined by the level to which eBuddy can offer products according to these factors of added value. The reliability is already taken into account, therefore the two additional factors that determine perceived quality are simplicity of product usage and market unique product features.

The product user expectations are defined by the expected level of reliability and customization by the product users from prior experience and their forecast of eBuddy's ability to deliver quality. The factors that determine reliability and customization for eBuddy are already defined for perceived quality; login performance, simplicity of product usage and market unique product features.

4.3.2 Objectives for product user satisfaction

The determinants for product user satisfaction for eBuddy are login performance, simplicity of product usage and market unique product features.

High login performance(7) is an objective in the customer perspective with a cause-and-effect relationship(j) with *high level of product user satisfaction(6)*, because a high level of login performance creates a high level of reliability of the products, thereby having a relationship with product user satisfaction.

Create simplicity of product usage(8) is an objective is determined by a cause-and-effect relationship(k) with *high level of product user satisfaction(6)*, because simplicity of product usage offers added value for product users and fits heterogeneous product user needs, thereby having a relationship with product user satisfaction.

The *offer market unique product features(9)* objective is also determined by a cause-and-effect relationship(i) with *high level of product user satisfaction(6)*, for its relationship with product user satisfaction by answering heterogeneous user needs.

4.3.3 Media coverage

The *increase media coverage(10)* objective is determined by a cause-and effect relationship(l) with company value, because it is a determinant of company value. This cause-and-effect relationship does not determine any objectives in the customer perspective and directly translates to an objective in the internal business process perspective. This corresponds with the fact that cause-and-effect relationships can identify objectives while skipping a perspective in the top-down translation approach from the financial to the learning and growth perspective (Kaplan & Norton 1996).

4.3.4 Number of advertisements sold

The *increase number of advertisements sold(11)* objective is determined by a cause-and effect relationship(m) with *increase revenue(2)*, because an increase in the amount of advertisements sold will increase eBuddy's revenue.

4.4 Learning and growth perspective

The learning and growth perspective contains objectives that reflect the infrastructure that the organization must build to create long-term growth and improvement (Kaplan & Norton 1996). These objectives are derived by cause-and-effect relationships with objectives in the internal business process perspective.

The two objectives in the learning and growth perspective are *employee skills(12)* and *product user interaction(13)*. The objective *employee skills(12)* has cause-and-effect relationships (n - r) with all objectives in the internal business process perspective. The set of employee skills in eBuddy define the level to which it's able to carry out the objectives set in the internal business process perspective. Employee skills are the set of different skills among staff.

The employee skills in the fields of product development and product management define the level to which eBuddy can *create simplicity of product usage(8), offer market unique product features(9)* and reach a *high level of login performance(7)*. The employee skills in the fields of sales and marketing determine the level to which eBuddy can increase the *number of advertisements sold(11)* and *increase the media coverage(10)*.

The objective *product user interaction(13)* has cause-and-effect relationships (s - t) with *create simplicity of product usage(8)* and *offer market unique product features(9)*. Both these objectives require eBuddy to interact with its users to determine detailed heterogeneous user needs on simplicity of product usage and value adding market unique product features. This user interaction is crucial to continue developing products that fit heterogeneous product user's needs, meet user expectations and fulfill a market potential.

4.5 Conclusions

eBuddy's strategy map in Figure 11 provides an overview of all strategic objectives and cause-and-effect relationships within eBuddy that contribute to the final strategic objective to increase its company value. The strategy map is the foundation of the balanced scorecard and strategic performance measures. Supported by the identified cause-and-effect relationships, the contribution of individual objectives to other objectives and the final strategic objectives are clarified in one diagram.

Next to identify suitable strategic performance measures, the strategy map is a tool to communicate strategy through the organization. It indicates to all business units how they can contribute to the overall company strategy.

4.5.1 Balanced scorecard roadmap evaluation

The factors of the balanced scorecard roadmap (as defined in Section 2.2) taken into account by the approach followed for the definition of the eBuddy strategy map are outlined in Table 6.

Main factors – development	
Set objectives and measures	By the definition of the eBuddy strategy map, all objectives are derived from eBuddy's strategy, supported by cause-and-effect relationships and top down definition of the objectives. The measures per objective are defined in eBuddy's balanced scorecard in Chapter 5.
Cause-and-effect linkage	All defined objectives are established by cause-and-effect relationships, derived from eBuddy's strategy.

Table 6: Balanced scorecard roadmap evaluation

The main factors; set objectives and measures and cause-and-effect linkage, which focus on the development process of a balanced scorecard, are taken into account by the strategy map definition. The next step in the definition and implementation of the balanced scorecard is to translate the objectives in the eBuddy strategy map into strategic performance measures, which is outlined in Chapter 5.

5 Definition of strategic performance measures

This chapter describes the definition of strategic performance measures for eBuddy. This definition is based on the balanced scorecard model (Kaplan & Norton 1996), see Section 2.1.1, and implemented following the strategy map defined in Chapter 4. Section 5.1 describes the approach for this definition.

5.1 Approach

For each objective in the strategy map (see Section 4.1), a set of measures is identified. Measures in the balanced scorecard can be divided in outcome measures and performance drivers:

1) Outcome measures are so called lag indicators that signal the ultimate objectives of the strategy and whether near-term efforts have led to desirable outcomes.
2) Performance drivers are lead indicators that signal to all organization participants what they should be doing today to create value in the future.

Performance drives and outcome measures should be linked to make clear how to create future value for the organizations strategy and to monitor if actions are translated into short-term expanded business and financial performance. This linkage is supported by the defined cause-and-effect relationships in the strategy map. When all measures are identified, the balanced scorecard can be created (Kaplan & Norton 1996).

The precondition for the identification of the performance measures is that they can be calculated with data currently available in-house (see Section 1.2.3). Therefore, the first step in the final identification of strategic performance measures is the analysis of data eBuddy currently has available in-house for the calculation of these measures. This analysis is outlined in Section 5.2.

Sections 5.3 to 5.6 describe the definition of strategic performance measures for each of the four different perspectives of the balanced scorecard. Section 5.7 describes eBuddy's balanced scorecard, which implementation will be outlined in Chapter 6.

5.2 In-house data

The two main in-house sources of data for the calculation of strategic performance measures are eBuddy's data warehouse and the site-compensation report. The data warehouse stores all in-house available data concerning product users and online advertisement publishing. The site-compensation report[19] gives an overview of the generated revenue.

5.2.1 The data warehouse

The contents of eBuddy's data warehouse are described using an entity relationship diagram (Wieringa 2003). An entity relationship diagram (ERD) is a technique to represent the structure of data in an information system. An entity is a discrete identifiable part of the world[20].

Each entity is an instance of a type. A type is shared by people to structure and direct their perceptions[21]. An entity type is represented in an ERD by a named rectangle.

All instances of an entity type share certain properties that can be represented by a value, called attributes. Attributes are represented in an ERD within the rectangle of an entity type.

[19] An example of this report is not included as Appendix due to confidentiality restrictions.
[20] Discrete means that an entity can be collected in a set and can be counted. Identifiable means that counting how many entities there are does not depend on the state of the counted entities.
[21] Example entities are chairs and Tables. Example entity types are chair and Table. An instance is a specific chair or Table.

A relationship between entity types is a set of tuples of instances of these types. Relationships that connect two entity types are called binary relationships and are represented in an ERD by an arrow connecting two entity type rectangles. Each relationship is identified by relative cardinality properties. A relative cardinality property indicates how many instances of one entity type can exist for each existing entity type it has a relationship with. Relative cardinality properties are represented in an ERD by a cardinality expression at the end of a relationship arrow.

Appendix 5 shows the ERD of eBuddy's data warehouse and clarification of the different attributes per entity type. Summarized from this ERD, the data warehouse provides data on the entity types; product users, product usage and advertisements. Table 7 provides a summarized overview of the available data that can be gathered per entity type, a detailed overview can be found in Appendix 5.

Entity type	Available data
Product user	Unique product user number Email address Each individual product usage
Product usage[22]	Specific product used Country from where the product is used IP address from where the product is used Date and time Duration Number of messages sent Average number of characters of messages sent Number of messages received Average number of characters of messages received Number of chat conversations carried out Login successful (yes / no) Personal picture used (yes / no) User agent (type of computer, mobile phone, gaming device or TV) Screen name (pseudonym of product user during chatting)
Advertisements	Number of advertisements published Number of clicks on advertisements Date and hour of the day of advertisements published Country where advertisements are published Specific location of publishing within one of the products Specific banners and campaigns published

Table 7: Summarized entity types and available information in data ware house

The data described in Table 7 can be used as input for the definition of strategic performance measures in Section 5.3 to 5.7

5.2.2 Site compensation report

The site compensation report is a spreadsheet that is updated manually every day. It contains data on the number of advertisements published, the number of clicks on advertisements and the revenue generated. At the end of the month this report gives an overview of the total revenue generated and its source. This data can be used as input for the definition of strategic performance measures in Section 5.3 to 5.7.

[22] A product usage is started when a product user logs in and ended when a user log's out on one of eBuddy's products.

5.3 Financial perspective

The final financial objective in eBuddy's strategy map is *increase company value(1)*. The three determinants of company value for eBuddy, translated in the strategy map, are the number of product users, revenue and media attention. The correlation between those three determinants is not identified and research on this subject falls out of research scope. The measure indicating the performance on the *increase company value(1)* objective is a combination of the measures indicating the performance on the objectives for the three determinants. However, since the correlation between these determinants is not identified, it is not possible to identify a single measure "company value".

The performance on the *increase company value(1)* objective will be indicated by three measures that represent the growth percentage of the three determinants of company value; **product user growth**[23], **revenue growth**, and **media coverage growth**. These are outcome measures because the measures represent the performance on objectives in lower levels of the strategy map.

The *increase revenue(2)*[24] objective can be translated in the outcome measures **revenue** and **revenue per product user**. The revenue highlights the total company revenue and the revenue per product user indicates the level to which eBuddy generates revenue from its user base. These measures are outcome measures because revenue is a final financial outcome of efforts in objectives in lower levels of the strategy map. The generated revenue is not available in the data warehouse, but can be acquired from the site compensation report.

5.4 Customer perspective

For each objective in the customer perspective, the identified measures are outlined in this Section.

5.4.1 Increase number of product users

The *increase number of product users(3)* objective can be translated in **number of product users**. This is both an outcome measure and performance driver, through the identified cause-and-effect relationships. In relationship with *increase revenue(2)* and *increase company value(1)*, the number of product users is a performance driver. In relationship with *increase level of viral marketing(4)*, it is an outcome measure. The number of product users can be acquired from the data warehouse.

5.4.2 Increase level of viral marketing

The *increase level of viral marketing(4)* can be translated into multiple measures. Viral marketing is implemented in four different ways for eBuddy.

1) On every chat conversation of an eBuddy product user, an automated promotional message is sent to the receiver promoting eBuddy (See Appendix 4 for an example);
2) The status message[25] of an eBuddy product user shows that this person is using eBuddy to all his contacts that are also using eBuddy (See Appendix 4 for an example);
3) Product users recommend eBuddy products to their friends, family and colleagues through chat conversations;
4) Product users refer to eBuddy on their blogs.

[23] Defined measures are **bold**.
[24] Objectives refer to eBuddy's strategy map. Each objective is uniquely numbered, as presented in the strategy map.
[25] A status message is a function of instant messaging applications whereby a user posts a message that appears automatically to all his contacts. Status messages often contain a description of if the person is available for instant messaging conversations at the moment or what his is doing.

The number of automated promotional messages can be measured by counting the number of chat conversations and will be referred to as the **number of viral messages**. This number is available in the data warehouse.

The eBuddy status message can not be measured by data currently available in-house. eBuddy does not store the contacts of each product user, so it is not possible to calculate the number of exposures of this message to other eBuddy product users.

The recommendations of eBuddy by product users through chat conversations can not be measured by data currently available in-house. eBuddy does not store the contents of chat conversation, so the number of recommendations can not be calculated.

The references to eBuddy by product users in their blogs can not be measured by data currently available in-house. However, there is an alternative to measure these references with data from outside the company. Although this falls out of the exact preconditions for this research (see Section 1.2.3), the acquirement of this measure provides added value for the short-term results of this research and therefore will be included. Google provides a service called Blog Search, which allows searching through blogs worldwide based on topic keywords. Searching by the keyword "eBuddy" provides an overview of all blog posts with the word eBuddy in title or content. Furthermore, Google allows to search in any defined timeframe, so for example the number of blog posts referencing eBuddy in one month can be obtained, see Appendix 6. Although using the Google Blog Search service to acquire the **number of blog references** will not be 100% accurate, it is the best data available and will be used as measure.

The **number of viral messages** and the **number of blog references** are the two measures that indicate the performance on the *increase level of viral marketing(4)* objective. These measures are both outcome measures and performance drivers. In relation with *increase product usage(9)* and *high level of product user satisfaction(6)*, the measures are outcome measures. In relation with *increase number of product users(3)*, they are performance drivers.

5.4.3 Increase product usage

Increased product usage means an increase of the duration per usage, intensity of use per usage and the number of times usage of eBuddy's products per user. The duration per product usage can be translated in the measure **average duration**, which provides the average duration of each product usage of all product users. This measure can be calculated from data in the data warehouse.

The intensity of use per product usage can be measured by the **average number of chat conversations** per product usage of all product users. This measure can be calculated from data in the data warehouse. Two additional possible measures that are available from data in the data warehouse are the average number of messages sent and received. However, the most important indicator of intensity of use is the number of chat conversations carried out. The number of chat conversations highlights to which intensity product users use the most important functionality; chatting. The number of messages sent and received are less relevant for measuring the intensity of use. The balanced scorecard targets at providing a small set of relevant measures and not to overload users of the scorecard with to much information. Therefore, the number of messages sent and received are not included as measures for intensity of use.

The number of times usage of eBuddy's products per user can be measured by the **average number of logins per product user** of all products. A login represents one product usage. This measure can be calculated from data in the data warehouse.

The **average duration**, the **average number of chat conversations** and the **average number of logins per product user** are the three measures that indicate the performance on the *increase product usage(5)* objective. These measures are both outcome measures and performance drivers. In relation with *high level of product user satisfaction(6)* the measures are outcome measures. In relation with *increase level of viral marketing(4)*, they are performance drivers.

5.4.4 High level of product user satisfaction

To determine the contents, determinants and impact of product user satisfaction in the strategy map, a customer satisfaction model developed by Fornell is applied (Fornell et al. 1996), see Section 3.3.2. According to this model, supported by several other authors of comparable research (Evanschitzky et al. 2004, Turel & Serenko 2004), immediate consequences of increased product user satisfaction are decreased customer complaints and increased customer loyalty (Fornell et al. 1996). This implicates that product user satisfaction can be measured by product user loyalty and product user complaints. To define a measure for product user satisfaction directly, product user satisfaction surveys need to be carried out. Currently there are no processes, responsibilities and information systems in place to implement product user satisfaction surveys. Therefore, the focus for measuring product user satisfaction lies on measuring product user complaints and loyalty, supported by their relationship with product user satisfaction.

If eBuddy product users want to communicate a complaint to eBuddy, they can do that by sending an email, posting a message in the online forum, or posting a message in the blog. Currently, there is no central point of contact within eBuddy that takes care of all product user complaints. At this point, responses to complaints are carried out ad hoc by several different employees.

Additionally, there is no central point of storage of all received product user complaints. Therefore, it is not possible to include the number of complaints as a measure, since it would first require new processes, responsibilities and information systems to be implemented within the organization.

Customer loyalty can be measured by **churn**. Churn is the percentage of product users that did not use the product again in a predefined period. An example of monthly churn is the percentage of product users that use an eBuddy product in January and did not use any product again in February. This measure can be calculated from data in the data warehouse.

The **churn** is defined as measure to indicate the performance on the *high level of product user satisfaction(6)* objective. This is both an outcome measure and performance driver. In relation with *create simplicity of product usage(8)*, *offer market unique product features(9)* and *operational excellence(7)* it is an outcome measure. In relation with *increase product usage(5)*, it is a performance driver.

5.5 Internal business process perspective

For each objective in the internal business process perspective, the identified measures are outlined in this Section.

5.5.1 Create simplicity of product usage

Simplicity of product usage for eBuddy is two-fold:

1) The number of actions a product user has to perform to use product functionality has to be minimized;
2) The user interface[26] has to provide clear directions for a product user that makes it very easy to understand how functionality can be used.

The simplicity of the user interface is a subjective measure. In this research it is not possible to quantify this measure with data available. The number of actions a user has to perform to reach the chat product functionality is captured in eBuddy's user interface flow chart, see Appendix 7. This flow chart is used and updated by the development business unit. The best available measures to indicate the performance on the *create simplicity of product usage(8)* objective is the number of actions a product user has to perform to reach the most important product functionality; chat. The development business unit tries to minimize this number of required steps in every new product release to offer simpler to use products; therefore it is a measure on this objective.

The **number of required user actions for chatting** is defined as measure to indicate the performance on the *create simplicity of product usage(8)* objective. This is both an outcome measure and performance driver. In relation with *employee skills(12)* and *product user interaction(13)* it is an outcome measure. In relation with *high level of product user satisfaction(6)*, it is a performance driver.

5.5.2 Offer market unique product features

Offering market unique product features means offering product features that are unique compared to all competitors in the market. The number of unique features is not available from data in the data-warehouse. However, eBuddy stores competitive information in one central Wiki[27] website in-house. This website allows all eBuddy employees to add information about functionalities that competitors are offering. The eBuddy product functionalities are compared with competitors in one Table which highlights the number of market unique product features. See Appendix 8. Although this overview might not be 100% accurate, because it fully depends on employee initiatives to update this overview, it is the best data source available to calculate a measure.

The **number of market unique product features** is defined as measure to indicate the performance on the *offer market unique product features(9)* objective. This is both an outcome measure and performance driver. In relation with *employee skills(12)* and *product user interaction(13)* it is an outcome measure. In relation with *high level of product user satisfaction(6)*, it is a performance driver.

[26] The means by which a product users interacts with a product, consisting of screen lay-out, software application and hardware device.
[27] An internal website based on the Wikipedia website functionality which allows users to add, remove and change content.

5.5.3 High login performance

A high level of login performance means assuring that eBuddy's products are ready to use at all time. This can be measured by the **successful login percentage**. This measure calculates the relationship between the number of times a product user wants to use one of eBuddy's products and can successfully login to start usage, and the number of times the logins are unsuccessful, which means a product user is not able to start usage of a product. This measure can be calculated from data available in the data warehouse.

The **successful login percentage** is defined as measure to indicate the performance on the *high login performance(7)* objective. This is both an outcome measure and performance driver. In relation with *employee skills(12)* it is an outcome measure. In relation with *high level of product user satisfaction(6)*, it is a performance driver.

5.5.4 Increase number of advertisements sold

The increase number of advertisements sold objective can be measured by calculating the percentage of total amount of advertisements sold, in relation with the total amount of advertisements published. The total number of advertisements published also contains own promotional advertisements that do not generate revenue. A percentage will provide a better measure than the number of advertisements sold itself, since this does not indicate how much of the total amount of advertisements published were sold. This measure can be calculated from data available in the data warehouse.

The **percentage of advertisements sold** is defined as measure to indicate the performance on the *increase amount of advertisements sold(11)* objective. This is both an outcome measure and performance driver. In relation with *employee skills(12)* it is an outcome measure. In relation with *increase revenue(2)*, it is a performance driver.

5.5.5 Increase media coverage

Media coverage means articles covering eBuddy as a company or its products in magazines, newspapers and websites. eBuddy uses an public relations information system called Vocus, which is accessible through a website. This system tracks worldwide media publications through all major media networks. It is possible to search through all publications based on keyword and a certain timeframe. For example searching on the keyword "eBuddy" for the month February will provide the total number of media articles covering eBuddy during that month, see Appendix 9. This information system might not cover the total media coverage on eBuddy worldwide 100% accurate. Small media networks or independent publishers are possibly not included in the overview. However, this system provides the best accurate information available and will provide a good picture of increasing or decreasing media attention, therefore it will be used to calculate a measure.

The **number of media publications** is defined as measure to indicate the performance on the *increase amount of media coverage(10)* objective. This is both an outcome measure and performance driver. In relation with *employee skills(12)* it is an outcome measure. In relation with *increase company value(1)*, it is a performance driver.

5.6 Learning and growth perspective

For each objective in the learning and growth perspective, the identified measures are outlined in this section.

5.6.1 Product user interaction

Product user interaction means all points of communication between eBuddy and its product users. Until recently this communication was very limited, consisting of only incidental email contact with individual product users. To start building growing product user interaction, eBuddy recently launched a blog as central point of contact between eBuddy as a company and its product users. One of the main targets of this blog is to interact with product users about current and future product developments and to gain better understanding of their needs and findings. The product user interaction can be measured by the **number of eBuddy blog posts** and the **number of eBuddy blog comments**. The number of blog posts are posts by eBuddy and the number of comments are the product user responses on these posts. These measures can not be calculated with data available in the data warehouse, but can be acquired from the eBuddy blog itself, see Appendix 10.

The **number of eBuddy blog posts** and the **number of eBuddy blog comments** are defined as measures to indicate the performance on the *product user interaction(13)* objective. These are performance measures because they have a cause-and-effect relationship with the performance on the *create simplicity of product usage(8)* and *offer market unique product features(9)* objectives in the internal business process perspective.

5.6.2 Employee skills

Employee skills are the set of different skills among staff. Within eBuddy the staff skills are currently not defined. Without this definition, it is not possible to measure employee skills within eBuddy.

The only measurable factor concerning employee skills is the staff size per business unit. For each of these business units, the Full Time Equivalent (fte), is stored in the internal employee administration. However, staff size and staff skills do not have a defined relationship which makes it impossible to measure employee skills by the number of fte’s per business unit.

At this point, no measure can be identified for employee skills within eBuddy. Recommendations on how to cope with this situation are made in Chapter 7.

5.7 eBuddy's balanced scorecard

The strategic performance measures identified in the four perspectives of the balanced scorecard define the balanced scorecard for eBuddy. Table 8 shows eBuddy's balanced scorecard. The implementation of this balanced scorecard is outlined in Chapter 6.

Strategic objectives	Strategic performance measures
Financial	
Increase company value	Product user growth Revenue growth Media coverage growth
Increase revenue	Revenue Revenue per product user
Customer	
Increase number of product users	Number of product users
Increase level of viral marketing	Number of viral messages Number of blog references
Increase product usage	Average duration Average number of chat conversations Average number of logins per product users
High level of product user satisfaction	Churn
Internal	
Create simplicity of product usage	Number of required user actions for chatting
Offer market unique product features	Number of market unique product features
High login performance	Successful login percentage
Increase number of advertisements sold	Percentage of advertisements sold
Increase media coverage	Number of media publications
Learning and growth	
Product user interaction	Number of eBuddy blog posts Number of eBuddy blog comments
Employee skills	-

Table 8: eBuddy's balanced scorecard

5.8 Conclusions

With the eBuddy strategy map as a starting point, the balanced scorecard definition process is completed with the definition of eBuddy's balanced scorecard. This scorecard defines 19 strategic performance measures for eBuddy. This strategic performance measurement system provides a complete and founded view on eBuddy's strategic performance and reflects common objectives by being aligned with eBuddy's strategy. Furthermore, it facilitates efficient strategic decision support by providing a small group of measurable, meaningful, and accurate performance measures. The identified measures are currently available from data within eBuddy, corresponding to the research preconditions (see 1.2.3).

eBuddy's balanced scorecard is not complete. For the employee skills objective, no strategic performance measure could be identified. Implementing an incomplete balanced scorecard contradicts the basic principle of balance between all identified objectives and measures.

The missing measure is purely a performance driver, and not also an outcome measure, which makes the impact of this missing measure within the scorecard limited. The employee skills objective is not a central objective that has cause-and-effect relationships with crucial other objectives, which would make it impossible to create a balanced scorecard without measures for this objective (such as in contradiction, for example missing measures for the number of product users would be).

The objectives of this research are aimed at short term fulfillment. There is a strong need for strategic performance measurement within eBuddy. Identifying the missing measurement as a show stopper for implementation would still leave eBuddy without any strategic performance measurement system. Because the missing measurement is not crucial for the balanced scorecard to be used, the scorecard will be implemented without a measure for the employee skills objective. Clear recommendations on how eBuddy should cope with this fact are made in Chapter 7.

5.8.1 Balanced scorecard roadmap evaluation

The factors of the balanced scorecard roadmap (as defined in Section 2.2) taken into account by the approach followed for the definition of eBuddy's balanced scorecard are highlighted in Table 9.

Main factors – development	
Set objectives and measures	For each objective defined in the strategy map in Chapter 4, the specific measures are set in eBuddy's balanced scorecard.
KPI's	eBuddy's balanced scorecard defines the strategic performance measures, which are the KPI's[28].
Supporting factor	
Finalize measures	A set of 19 strategic performance measures is defined by the objectives and cause-and-effect relationships in the strategy map and an analysis of available data for the calculation of these measures.

Table 9: Balanced scorecard roadmap evaluation

The main factors; set objectives and measures and KPI's, which focus on the development process of a balanced scorecard, are taken into account by eBuddy's balanced scorecard definition. The supporting factor; finalize measures is also taken into account by this definition.

The definition of the balanced scorecard finalizes the definition component of this research. The next step is to implement the strategic performance measures identified in eBuddy's balanced scorecard, which is outlined in Chapter 6.

[28] Key performance indicator is a synonym for strategic performance measure.

6 Implementation

This chapter provides an overview of the implementation of the strategic performance measures, identified in the eBuddy balanced scorecard (see Section 5.7). From the balanced scorecard roadmap, defined in Section 2.2, an implementation roadmap is defined, outlined in Section 6.1. The application of this implementation roadmap is outlined in Sections 6.2 to 6.4 and evaluated in Section 6.5.

6.1 Implementation roadmap

The factors of the balanced scorecard roadmap that are not taken into account in the definition process (see Sections 3.4, 4.6, 5.8) focus on the implementation steps to take. These factors define the implementation roadmap, which is outlined in Table 10.

Main factors – planning	
Initial plan	Before implementation, sources of performance data should be identified.
Main factors – implementation	
Information system design	An information system that presents and communicates the balanced scorecard through the organization should be developed.
Main factors – sustainability	
Automating the balanced scorecard	Automate the balanced scorecard and choose the most appropriate software.
Updating balanced scorecard measures and linking them with rewards	Rewards and bonuses for employees have to bide tied with the results of the balanced scorecard measures. The measures have to be updated to changed internal or external circumstances and reviewed at least once a year.
Corporate alignment	Strategic initiatives should be aligned with strategic objectives identified in the balanced scorecard.
Benchmarking	Compare balanced scorecard results with performance of competitors and with own past performance.
Main factors - benefits realization	
Regular reporting	Use the balanced scorecard for regular reporting on an identified timeframe.
Measurements assessment	The strategic performance of eBuddy should be assessed from results on measures in the balanced scorecard.
Problem solving and action planning	Use balanced scorecard measures in problem-solving processes and communication of problems.
Supporting factors	
Integration	The balanced scorecard should be integrated in the strategic management system.
Fine tuning and refining	Communicate balanced scorecard results throughout the organization and compare current performance with past results.
Finalize balanced scorecard plan	Specify precise meanings of the strategic performance measures.

Table 10: Balanced scorecard implementation roadmap

6.2 Initial plan

The initial plan identifies the sources of data to calculate the strategic performance measures in eBuddy's balanced scorecard. These sources for the measures are summarized in Table 11.

Strategic objectives	Strategic performance measures	Data source
Financial		
Increase company value	Product user growth[29] Revenue growth Media coverage growth	Data warehouse Site compensation report Vocus PR information system
Increase revenue	Revenue Revenue per product user	Site compensation report Site compensation report & data warehouse
Customer		
Increase number of product users	Number of product users	Data warehouse
Increase level of viral marketing	Number of viral messages Number of blog references	Data warehouse Google blog search
Increase product usage	Average duration Average number of chat conversations Average number of logins per product user	Data warehouse Data warehouse Data warehouse
High level of product user satisfaction	Churn	Data warehouse
Internal		
Create simplicity of product usage	Number of required user actions for chatting	eBuddy user interface flow chart
Offer market unique product features	Number of market unique product features	In-house Wiki website
High login performance	Successful login percentage	Data warehouse
Increase number of advertisements sold	Percentage of advertisements sold	Data warehouse
Increase media coverage	Number of media publications	Vocus PR information system
Learning and growth		
Product user interaction	Number of eBuddy blog posts Number of eBuddy blog comments	eBuddy blog eBuddy blog
Employee skills	-	-

Table 11: Data sources for strategic performance measures.

The data from the sources; site compensation report, Vocus PR information system, eBuddy user interface flow chart, Google blog search, in-house Wiki website and eBuddy blog has to be manually gathered. The data from the data warehouse can be gathered by defining database queries.

[29] The product user growth, revenue growth and media coverage growth can be calculated by a comparison of current and past results based on an identified time frame. No database queries or manual gathering of data are necessary.

6.3 Data warehouse database queries

A query is database lingo for a question about the data (Ullman & Widom 1997). eBuddy's data warehouse is managed by a relational [30] Oracle database management system. A database management system allows users to create new databases and specify the logical structure of data. It gives users the possibility to query the data by a selected query language, supports the storage of large amounts of data and controls access of many users at once (Ullman & Widom 1997). eBuddy's data warehouse uses the SQL[31] query language to query and modify the data.

The most common form of SQL queries are "SELECT-FROM-WHERE" queries. This allows to take the product of several relations (the FROM clause), apply a condition to the tuples of the result (the WHERE clause), and produce desired components (the SELECT clause). The queries needed to gather the performance measure data form the data warehouse are all in this form. For each of the strategic performance measures that are calculated from data in the data warehouse, outlined in Table 11, the SQL query is identified. See Appendix 5 for the entity relationship diagram of the data warehouse, which indicates the entity's, relationships and attributes to which the SQL query's refer.

6.3.1 Number of product users

Query 1 calculates the number of product users within a certain timeframe.

```
SELECT COUNT(DISTINCT cs.user_id)

FROM dwh.chatsessions cs
      INNER JOIN dwh.calendar c on (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03'
      AND cs.loginsuccess = '1';
```

Query 1: Number of product users

The FROM clause indicates from which tables data is presented. In this case it concerns the 'chatsessions' table in the data warehouse database, which is called 'dwh'. The 'chatsessions' Table is referred to as 'cs' within the query. This table contains each individual product usage of all product users and all products. The INNER JOIN statement finds the intersection between the two tables 'chatsessions' and 'calendar'. This is necessary since the 'chatsessions' table does not contain a specific date for each product usage, but reference to a unique date in the 'calendar' table.

This reference is the 'login_cldr_id'[32] attribute of the 'chatsessions table', which refers to a unique date on which the product usage started in the 'calendar' table. By using the INNER JOIN statement, a query on the 'chatsessions' table can be done while a condition in the referred 'calendar Table' is met.

The WHERE clause gives the conditions that the presented data has to meet. In this case, the condition is a certain timeframe in which the number of users has to be counted. As an example timeframe is set to one month, March 2007. The second condition set is that the value of the 'loginsuccess' attribute equals '1'. This assures that only product users that successfully could use a product are counted[33].

[30] Database management systems that present the user with a view of data organized as Tables called relations (Ullman & Widom 1997).
[31] Structured Query Language
[32] In the query this attribute is called 'cs.login_cldr_id', which indicates that this attribute belongs to 'cs', the 'chatsessions' Table.
[33] When a product user makes a typo in the username or password, the product usage will be unsuccessful, but a new unique user identification is stored in the database. Since this not represents a product user, this case should be excluded.

The SELECT clause indicates which data will be presented by the query. In this case it supplies the number of product users. It uses one of the SQL aggregation operators, COUNT, which counts the number of values. The value that is counted is the ‘user_id’ in the ‘chatsessions’ Table, which is a unique identification number of a product user. The SQL keyword DISTINCT assures that duplicate ‘user_id’ values are removed, thereby counting each unique user only once, independent of the number of product usages by each product user.

6.3.2 Number of viral messages

A viral message is an automated promotional message sent to each person who chats with an eBuddy product user. The number of viral messages can be measured by counting the number of chat conversations, calculated by Query 2.

```
SELECT SUM(cs.num_sessions)

FROM dwh.chatsessions cs
      INNER JOIN dwh.calendar c on (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03';
```

Query 2: Number of viral messages

The FROM clause indicates the concerned table is the ‘chatsessions’ table in the data warehouse database. The INNER JOIN statement finds the intersection between the two tables ‘chatsessions’ and ‘calendar’, as in Query 1.

The WHERE clause gives the condition of a certain timeframe in which the number of viral messages has to be counted. As an example timeframe is set to one month, March 2007.

The SELECT clause presents the number of chat conversations conducted by using the SQL aggregation operator SUM. This sums up the values of ‘num_sessions’, which is the number of conducted chat conversations of each product usage.

6.3.3 Average duration

The average duration provides the average duration of each product usage of all product users. This can be calculated by dividing the total duration by the total number of product usages.

```
SELECT AVG(cs.duration)

FROM dwh.chatsessions cs
      INNER JOIN dwh.calendar c on (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03'
      AND cs.loginsuccess = '1';
```

Query 3: Average duration

The FROM clause indicates the concerned table is the ‘chatsessions’ table in the data warehouse database. The INNER JOIN statement finds the intersection between the two tables ‘chatsessions’ and ‘calendar’, as in Query 1.

The WHERE clause gives the condition of a certain timeframe in which average duration has to be counted. As an example timeframe is set to one month, March 2007. The second condition set is that the value of the 'loginsuccess' attribute equals '1'. This assures that only the duration of the product usages that were successful are counted. This is necessary since for an unsuccessful product usage still certain duration is stored in the database. This case has to be excluded from the calculation.

The SELECT clause presents the average duration of each product usage by using the SQL aggregation operator AVG. This calculates the average 'duration', which is the duration of each product usage.

6.3.4 Average number of chat conversations

The average number of chat conversations provides the average number of chat conversations per product usage of all product users. This can be calculated by dividing the total number of chat conversations by the total number of product usages.

```
SELECT AVG(cs.num_sessions)

FROM dwh.chatsessions cs
      INNER JOIN dwh.calendar c on (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03'
      AND cs.loginsuccess = '1';
```

Query 4: Average number of chat conversations

The FROM clause indicates the concerned table is the 'chatsessions' table in the data warehouse database. The INNER JOIN statement finds the intersection between the two tables 'chatsessions' and 'calendar', as in Query 1.

The WHERE clause gives the condition of a certain timeframe in which the average number of chat conversations has to be calculated. As an example timeframe is set to one month, March 2007. The second condition set is that the value of the 'loginsuccess' attribute equals '1'. This assures that the average duration is calculated by dividing the total number of chatsessions by the total number of successful product usages. Without this condition, the average would be calculated by also taking unsuccessful product usages into account, which would present an unrealistic lower average.

The SELECT clause presents the average number of chatsessions of each successful product usage by using the SQL aggregation operator AVG. This calculates the average 'num_sessions', which is the number of chatsessions in each product usage.

6.3.5 Average number of logins per product user

The average number of logins per product user represents the average number of times usage of eBuddy's products per user. This can be calculated by dividing the total number of logins by the total number of product users. A login represents one product usage.

```
SELECT COUNT(*) / COUNT(DISTINCT cs.user_id)

FROM dwh.chatsessions cs
      INNER JOIN dwh.calendar c on (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03'
      AND cs.loginsuccess = '1';
```

Query 5: Average number of logins per product user

The FROM clause indicates the concerned table is the ‘chatsessions’ table in the data warehouse database. The INNER JOIN statement finds the intersection between the two tables ‘chatsessions’ and ‘calendar’, as in Query 1.

The WHERE clause gives the condition of a certain timeframe in which the average number logins per product user has to be counted. As an example timeframe is set to one month, March 2007. The second condition set is that the value of the ‘loginsuccess’ attribute equals ‘1’. This assures that the average number of logins per product user is calculated by dividing the total number of successful logins by the total number of product users that successfully used a product.

The SELECT clause calculates the average number of logins per product user. The total amount of logins equals the total number of rows that meet the conditions in the WHERE clause. This amount is calculated by the SQL aggregation operator COUNT, where ‘(*)’ stands for the total number of rows. This is divided using the ‘/’ operator by the total number of product users that meet the conditions in the WHERE clause. This total number of product users is calculated by counting ‘user_id’ with use of the DISTINCT aggregation operator. This assures that duplicate ‘user_id’ values are removed, thereby counting each unique user only once.

6.3.6 Churn

Churn is the percentage of product users that did not use the product again in a predefined period.

```
SELECT COUNT(DISTINCT cs.user_id)

FROM dwh.chatsessions cs
       INNER JOIN dwh.calendar c ON (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03'
      AND cs.loginsuccess = '1'
      AND cs.user_id IN (
         SELECT DISTINCT cs2.user_id
         FROM dwh.chatsessions cs2
         INNER JOIN dwh.calendar c2 ON (c2.cldr_id = cs2.login_cldr_id)
         WHERE c2.month = '2007-02'
         AND cs.loginsuccess = '1'
         );
```

Query 6: Churn

The FROM clause indicates the concerned table is the ‘chatsessions’ table in the data warehouse database. The INNER JOIN statement finds the intersection between the two tables ‘chatsessions’ and ‘calendar’, as in Query 1.

The WHERE clause first gives two conditions, the desired timeframe and the condition to only include successful product usages, as in proceeding queries. The third condition is a so called sub-query. What this does in short is to check for every product user that successfully used a product in March, if this user also successfully used a product in February. The sub-query, starting at the second SELECT clause, presents a list of 'user_id', the unique product user identifications, for all product users that successfully used a product in February. The DISTINCT operator assures that duplicate 'user_id' values are removed, thereby presenting each unique user only once, independent of the number of product usages in February by this user.

The SELECT clause calculates the number of unique product users that successfully used a product in February, and again in March.

The churn can now be calculated. The result of Query 6 has to be divided by the total number of product users in February. This total number can be calculated using Query 1, number of product users, with February as timeframe. This division represents the percentage of users that used a product in February and came back to use a product again in March. The final churn equals 100% minus the result of this division, which represents the percentage of February users that did not came back in March.

6.3.7 Successful login percentage

The successful login percentage is the relationship between the number of times a product user wants to use one of eBuddy's products and can successfully login to start usage, and the number of times the logins are unsuccessful, which means a product user is not able to start usage of a product. This can be calculated by dividing the total number of successful logins by the total number of logins. There are two queries defined to calculate each of these numbers for the division.

```
SELECT COUNT(*)

FROM dwh.chatsessions cs
      INNER JOIN dwh.calendar c on (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03'
      AND cs.loginsuccess = '1';
```

Query 7: Total number of successful logins

```
SELECT COUNT(*)

FROM dwh.chatsessions cs
      INNER JOIN dwh.calendar c on (c.cldr_id = cs.login_cldr_id)

WHERE c.month = '2007-03';
```

Query 8: Total number of logins

Query 7 counts the total number of successful logins. The COUNT operator counts the number of rows returned by the FROM and WHERE clause, indicated by '(*)'. The same holds for Query 8, with the exeption that this counts the total number of logins, both successful and unsuccessful. The final successful login percentage is the result of Query 7 divided by the result of Query 8.

6.3.8 Percentage of advertisements sold

The percentage of advertisements sold is the total number of advertisements sold, in relationship with the total number of advertisements published. The total amount of advertisements published also contains eBuddy's own promotional advertisements, called house ads. There are two queries defined to calculate each of these numbers for the division.

```
SELECT SUM(ac.views)

FROM dwh.adstats_country ac
      INNER JOIN dwh.calendar c ON (c.cldr_id = ac.cldr_id)
      INNER JOIN dwh.banners b ON (b.bannerid = ac.banner_id)

WHERE c.month = '2007-03'
      AND b.bannerid NOT IN
      ('67','68','90','91','92','110','111','129','137','144','146','147
      ','148','149','150','151','167','168','186','195','203','222','228
      ','229','239','296','305','409','410','417','418','419','420','439
      ','441','453','454','475','484','497','498','499','529','536','537
      ','542','543','544','545','546','548','557','569','681','700','758
      ','888','1148','1149','1675','1752','1767','1769','1842','1847','1
      848','1849','1851','1860','1924','1925','1926','1927','1928','1929
      ','1930','1934','1937','1938','1964','1965','1984','1985','2076','
      2077','2078','2106','2328','2570','2571','2604','2605','2606','260
      8','2609','2612','2617','2725','2769','2770','2771','2786','2787',
      '2788','3004','3005','3264','3265','3282','3283','3284')
      AND ac.zone_id IN
      ('1','3','6','16','19','24','25','52','54','76','149','150','160',
      '161','172');
```

Query 9: Total number of sold advertisements published

```
SELECT SUM(ac.views)

FROM dwh.adstats_country ac
      INNER JOIN dwh.calendar c ON (c.cldr_id = ac.cldr_id)

WHERE c.month = '2007-03'
      AND ac.zone_id IN
      ('1','3','6','16','19','24','25','52','54','76','149','150','160',
      '161','172');
```

Query 10: Total number of advertisements published

Query 9 calculates the total number of sold advertisements that are published.

The FROM clause indicates the 'adstats_country' table in the data warehouse database is the source of data that is presented. The 'adstats_country' table is referred to as 'ac' within the query. This table contains the number of advertisements published.

The INNER JOIN statement finds the intersection between the two tables 'adstats_country' and 'calendar'. This is necessary since the 'adstats_country' table does not contain a specific date for each advertisement publishing, but a reference to a unique date in the 'calendar' table. This reference is the 'cldr_id' attribute of the 'adstats_country' table, which refers to a unique date on which the advertisements are published in the 'calendar' table. The second INNER JOIN statement finds the intersection between the two tables 'adstats_country' and 'banners'.

The ‘banners’ table holds information of each specific advertisement published. The ‘adstats_country’ table refers to a unique banner for each advertisement published with the ‘banner_id’ reference. By using the three INNER JOIN statements, a query on the ‘adstats_country’ Table can be done while conditions in the referred ‘calendar’ and ‘banners’ tables are met.

The WHERE clause gives three conditions. First, a certain timeframe in which the number of sold advertisements that are published has to be identified. As an example timeframe is set to one month, March 2007. The second condition set is that the ‘bannerid’ attribute in the ‘banner’ Table must not equal one of the highlighted values. These values represent the unique identification numbers of all own promotional house ads, which are not sold. The third condition set is that the ‘zone_id attribute in the ‘adstats_country’ Table must equal one of the highlighted values. These values represent the unique identification number of the specific locations where sold advertisements can be published within eBuddy’s products. These three conditions narrow down the presented data to the number of total sold advertisements published within a certain timeframe.

The SELECT clause presents the number of sold advertisements published by using the SQL aggregation operator SUM. This sums up the values of ‘views’, which is the number advertisements published per specific advertisement.

Query 10 has great resemblance with Query 9. The difference is that it calculates all published advertisements on all locations within the products that are suited for paying advertisement publishing, including house ads.

The final percentage of advertisements sold can be calculated by dividing the result of Query 9 by the result of Query 10.

6.4 Selection of software application

The implementation roadmap indicates the balanced scorecard should be automated and presented by an information system. The gathering of performance measure data from the data warehouse is partly automated by the definition of the database queries (see Section 6.3).

There are two components of automation of the balanced scorecard calculation:

1) Automation of the execution of the database queries, storage of the results and calculation of the measures;
2) Automation of the gathering from the other sources of data[34], storage of the results and calculation of the measures.

The automation of database queries is not possible due to time limitations within this research. The manual initiation of the developed database queries is limited to loading each query in an SQL query application and waiting for the results to be presented. This is not very time consuming and the total number of queries is also limited.

The automation of the other sources of data is not advisable. The data warehouse is a stable source of data, but the other sources are not. By fully automating the gathering of measures, the balanced scorecard information system will become completely dependent on changes in the presentation of information in these sources. For example, if Google's blog search service will be updated, this may require the balanced scorecard information system to be updated also. Since there are six different sources of data, it is not advisable to fully automate the gathering of data from these sources. This would create a high level of dependency and consequently requires frequent investment in change development of the information system.

From these motivations, the gathering of performance measure data will not be fully automated. The software application that will present the balanced scorecard is aimed at a proof of concept. The database queries are manually initiated and the data from other sources is manually gathered. The presentation of the balanced scorecard will be done with a Microsoft Excel spreadsheet. Before describing the presentation of the balanced scorecard in an Excel spreadsheet, the timeframe on which the measures are reported is described.

6.4.1 Regular reporting

One of the implementation roadmap steps is that the balanced scorecard should be used for regular reporting on an identified timeframe. This regular supporting also enables the organization to internally benchmark balanced scorecard results with past performance.

The selected timeframe of regular reporting should enable management to support strategic decision making with a high level of environmental uncertainty (see 3.3.5). The timeframe has to be short enough to act upon changes in the internal of external environment, but long enough not to require unnecessary attention from management, since one of the objectives of this research is to make strategic decision support more efficient, less time consuming for management.

The timeframe of regular reporting is set to one calendar month. This timeframe had proven itself to be short enough to act upon changes in the internal and external environment. So far, management always received reporting of both product user and revenue numbers on a monthly basis. Management is accustomed to this timeframe to review its strategic position and act upon changes. Furthermore, a timeframe of one month prevents presenting unrealistic negative performance measures.

[34] The site compensation report, Vocus PR information system, eBuddy user interface flow chart, Google blog search, in-house Wiki website and eBuddy blog

The largest part of eBuddy's product users consists of youth at school. During a school holiday these users typically will not use eBuddy's products. This affects the performance on several objectives in the scorecard. Past experience however learnt that these users will use a product again after the holiday back on school. The timeframe of one month overlaps regular school holidays[35] and is implemented in the presentation of the balanced scorecard measures in an Excel spreadsheet.

6.4.2 Excel spreadsheet

A Microsoft Excel spreadsheet will be used as the software application to calculate and present the strategic performance measures to management. The choice for Excel is based on the following motivations:

1) Fast implementation support; objectives for this research are aimed at short term fulfilment. An Excel spreadsheet for the presentation of the measures can be developed in a short period;
2) Flexible presentation; one of the steps in the implementation roadmap is the regular updating of balanced scorecard measures according to changes in the internal and external environment. Since eBuddy is facing a highly dynamic company environment, the information system presenting the scorecard measures must be very flexible. Excel spreadsheets are very flexible for changes in presentation that will require limited effort to implement changes;
3) Easy to understand; Excel is already used within eBuddy as standard reporting tool. Therefore employees easily understand an Excel spreadsheet and knowledge to implement changes is present in-house.

The developed Excel eBuddy balanced scorecard spreadsheet is presented in Figure 14 and contains an overview of the strategic performance measures and past performance.

[35] Except school summer holidays, but eBuddy is familiar with the seasonal effects of these holidays.

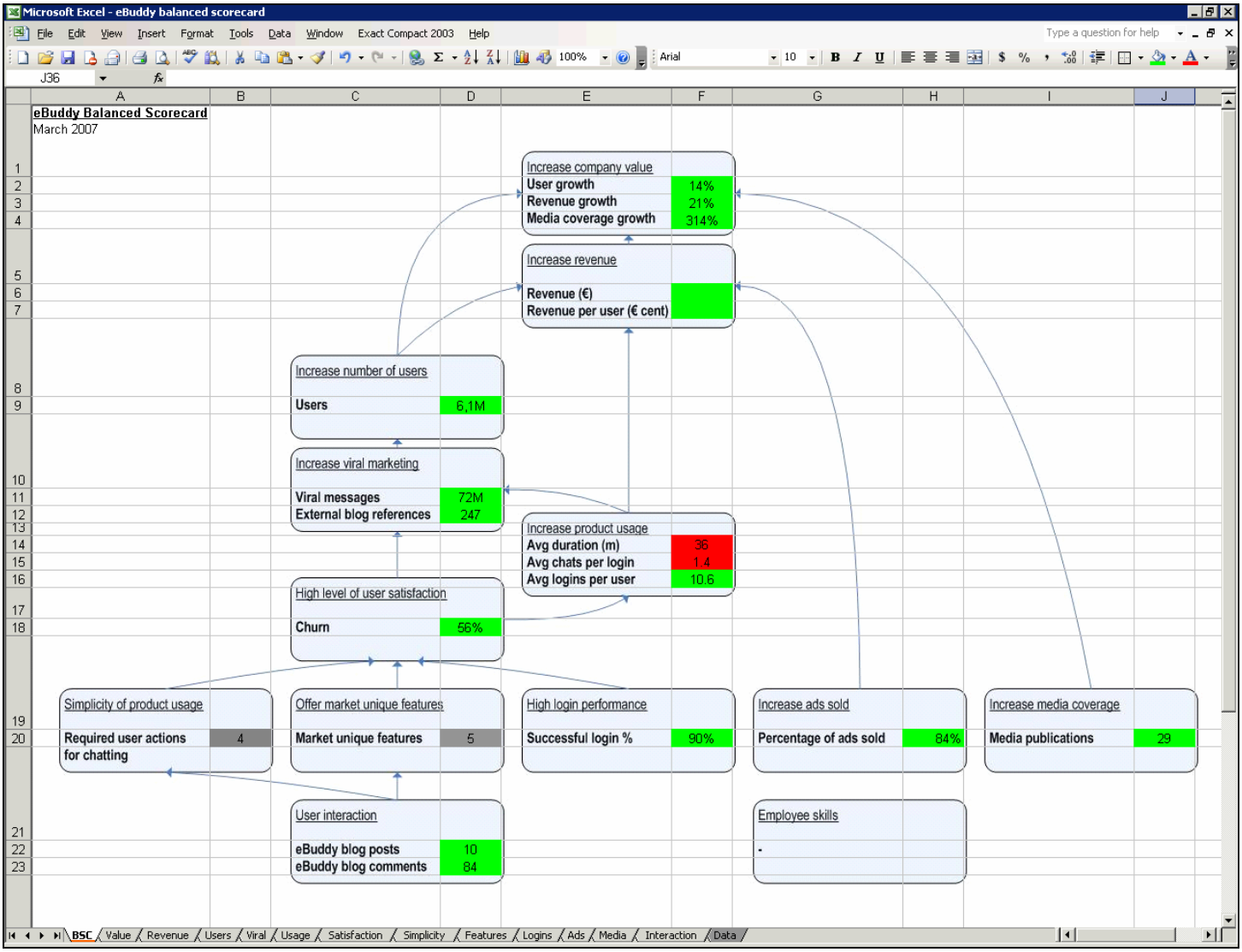


Figure 14: Balanced scorecard spreadsheet; balanced scorecard sheet[36]

The main 'BSC' sheet presents the values of the strategic performance measures from the preceding month. The measures are presented in the lay-out of the strategy map. An understanding of the cause-and-effect relationships between strategic objectives through the organization is the foundation of the balanced scorecard. When efforts and resources create improving performance in an objective, this should translate to improving performance results of cause-and-effect related objectives within a certain timeframe. Therefore, is it important to look at the performance measures from the perspective of the strategy map. Furthermore, this stimulates the organization to adapt its strategy map and balanced scorecard to changes in the internal or external environment. The performance on each measure compared to the month before is indicated with colours. Green represents an improved, red decreased and grey equal performance. This colour indication is aimed at providing a clear view on changes in the strategic performance.

[36] This Figure does not show revenue Figures due to confidentiality.

For each objective in the strategy map, highlighted in the ‘BSC’ sheet, the past performance of the identified measures is indicated. For example, the ‘Value’ sheet highlights the development of past performance on the three defined measures, presented in Figure 15. These sheets provide a clear view of development of performance per objective.

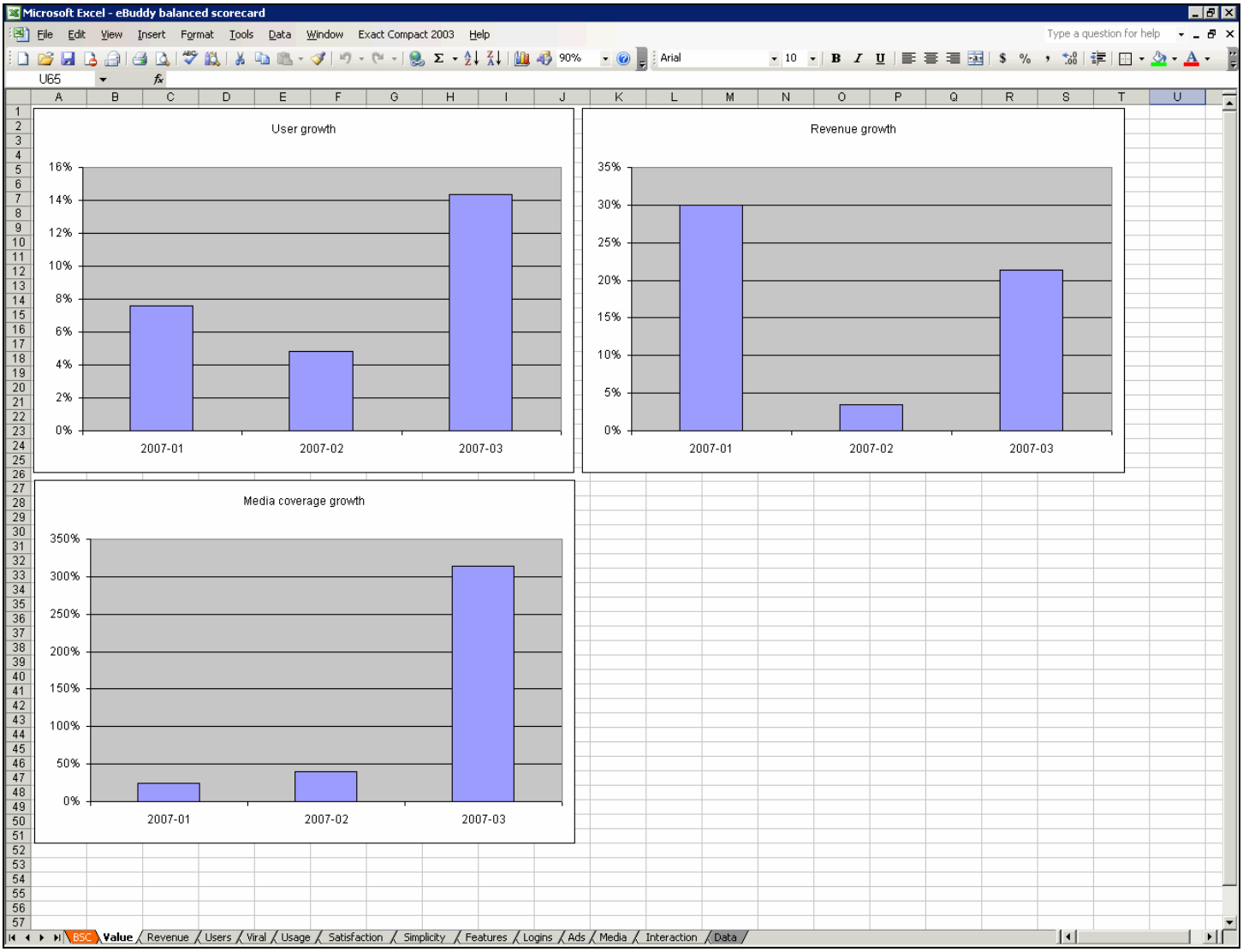
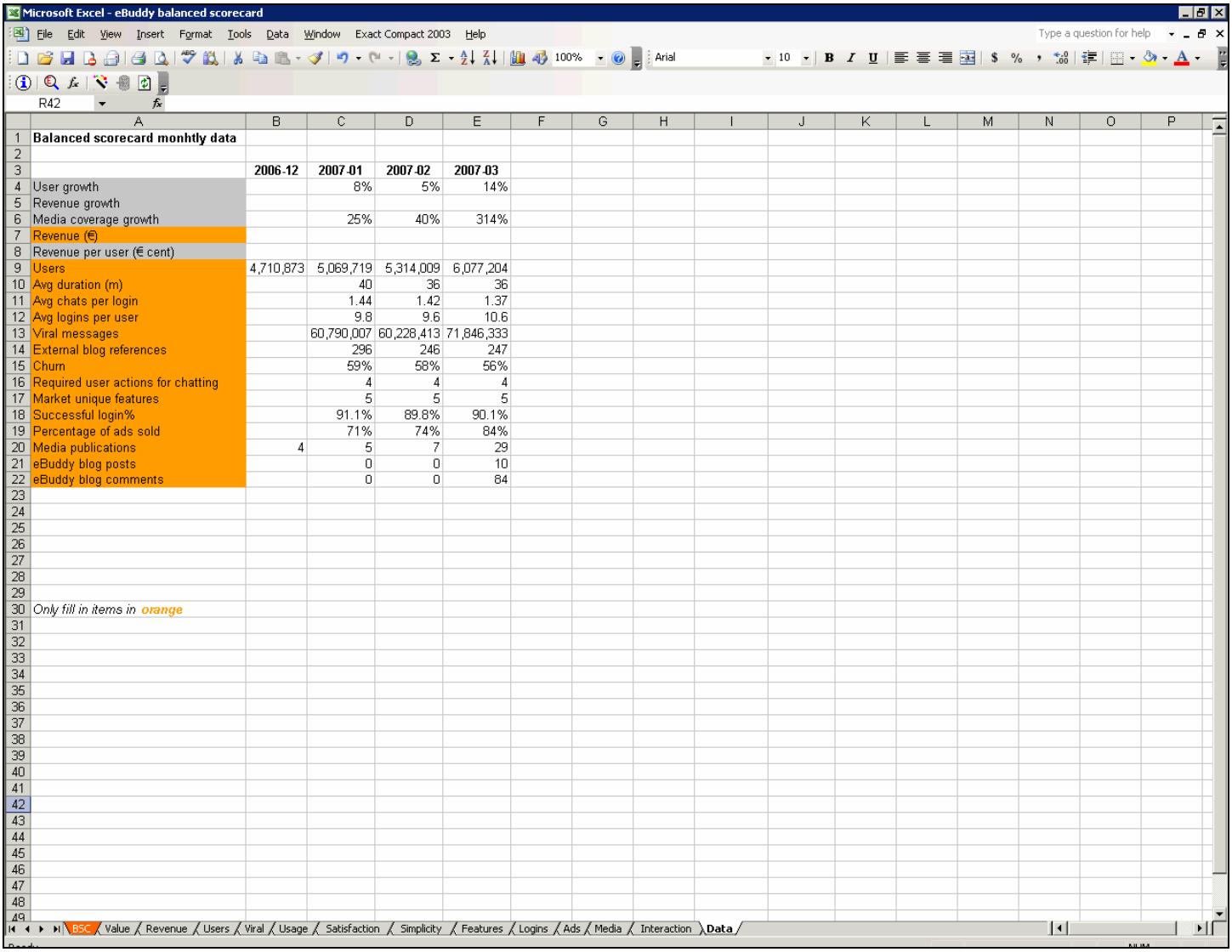


Figure 15: Balanced scorecard spreadsheet; past performance of company value measures

The ‘data’ sheet presented in Figure 16 contains all values of the strategic performance measures per month. All measures from the different sources are manually entered in this sheet, marked by the orange colour. Four measures are calculated in this sheet itself, marked by the grey colour. This data sheet supports the presentation of the whole spreadsheet.



Microsoft Excel - eBuddy balanced scorecard

File Edit View Insert Format Tools Data Window Exact Compact 2003 Help

R42

	A	B	C	D	E
1	**Balanced scorecard monhtly data**				
2					
3		**2006-12**	**2007-01**	**2007-02**	**2007-03**
4	User growth		8%	5%	14%
5	Revenue growth				
6	Media coverage growth		25%	40%	314%
7	Revenue (€)				
8	Revenue per user (€ cent)				
9	Users	4,710,873	5,069,719	5,314,009	6,077,204
10	Avg duration (m)		40	36	36
11	Avg chats per login		1.44	1.42	1.37
12	Avg logins per user		9.8	9.6	10.6
13	Viral messages		60,790,007	60,228,413	71,846,333
14	External blog references		296	246	247
15	Churn		59%	58%	56%
16	Required user actions for chatting		4	4	4
17	Market unique features		5	5	5
18	Successful login%		91.1%	89.8%	90.1%
19	Percentage of ads sold		71%	74%	84%
20	Media publications	4	5	7	29
21	eBuddy blog posts		0	0	10
22	eBuddy blog comments		0	0	84
30	*Only fill in items in orange*				

BSC | Value | Revenue | Users | Viral | Usage | Satisfaction | Simplicity | Features | Logins | Ads | Media | Interaction | Data

Figure 16:Balanced scorecard spreadsheet; data sheet[37]

[37] This Figure does not show revenue Figures due to confidentiality.

6.5 Conclusions

The implementation of strategic performance measures for eBuddy is completed within research scope. With the eBuddy balanced scorecard as a starting point, the sources of data are identified, the database queries to gather necessary data from the data warehouse are created and the balanced scorecard is made usable through an Excel spreadsheet which functions as proof of concept.

A timeframe for regular reporting is set to one calendar month, which enables benchmarking of the balanced scorecard results. The balanced scorecard spreadsheet can now be used by eBuddy management to asses the company's monthly strategic performance and to benchmark this performance with past results and results of competitors.

The final deliverables of this research are eBuddy's strategy map, balanced scorecard, overview of data sources and database queries and proof of concept balanced scorecard spreadsheet. These deliverables answer the research objective by providing eBuddy with strategic performance measurement and the means to make this accessible to management.

6.5.1 Evaluation of implementation roadmap

At this point in the implementation, the strategic performance measures are ready to use by the defined strategy map, measures, data sources and balanced scorecard Excel spreadsheet. The developed strategic performance measurement system is complete.

Table 12 summarizes the implementation steps taken per success factor of the implementation roadmap as defined in Section 6.1. Of the implementation roadmap the initial plan, information system design and balanced scorecard automation success factors are answered in the definition of data sources, database queries and Excel spreadsheet. This spreadsheet enables regular reporting of strategic performance measurements assessment for eBuddy and is flexible to update the balanced scorecard measures. Furthermore, it facilitates both external and internal benchmarking. By the presentation of the monthly performance results, these can be compared with the performance of competitors, facilitating external benchmarking. The presentation of the past development of strategic performance facilitates internal benchmarking.

Main factors – planning	How implemented?
Initial plan	Description of data sources and database queries.
Main factors – implementation	
Information system design	Excel balanced scorecard spreadsheet.
Main factors – sustainability	
Automating the balanced scorecard	Excel balanced scorecard spreadsheet.
Updating balanced scorecard measures and linking them with rewards	-
Corporate alignment	-
Benchmarking	Excel balanced scorecard spreadsheet.
Main factors - benefits realization	
Regular reporting	Excel balanced scorecard spreadsheet and identified timeframe of one calendar month.
Measurements assessment	Excel balanced scorecard spreadsheet.
Problem solving and action planning	-
Supporting factors	
Integration	The balanced scorecard is the strategic performance measurement system for eBuddy, no integration which other existing systems applies.
Fine tuning and refining	Excel balanced scorecard spreadsheet.
Finalize balanced scorecard plan	Definition of strategy map, measures data sources and database queries.

Table 12: Balanced scorecard implementation roadmap evaluation

Three success factors that are not implemented so far, but are recommendations to management on how the balanced scorecard should be used are updating the measures and linking them with rewards, corporate alignment, and problem solving and action planning.

7 Conclusions and recommendations

This chapter highlights the final conclusions and recommendations of this research. Section 7.1 summarizes the answers of the research questions. Section 7.2 highlights the recommendations from this research to eBuddy management. The research steps taken are evaluated in Section 7.3 and contribution of this research to both eBuddy and the academic world is outlined in Section 7.4. Section 7.5 finalizes this thesis by giving recommendations for future research.

7.1 Answers on research questions

The research questions identified in the research model in 1.3 are all covered in this research. The answers on the research questions are summarized in Table 13.

1)	How can strategic performance measurement be defined and implemented for eBuddy according to literature?
a)	*What is strategic performance measurement?* Strategic performance is the result in day-to-day business of strategic goals set. Strategic performance measurement is measuring the strategic performance. This measurement is done with strategic performance measures. Strategic performance measures are financial and non-financial metrics used to quantify objectives to reflect strategic performance of an organization.
b)	*How can strategic performance measurement be defined and implemented according to literature?* Discussed literature that provides a model to define strategic performance measurement is: - The balanced scorecard by Kaplan & Norton (Kaplan & Norton 1996); - The balanced scorecard model by Maisel (Mailsel 1992); - The performance pyramid by McNair (McNair et al. 1990); - Effective progress and performance measurement by Adams & Roberts (Adams & Roberts 1993). Several other models are developed for measuring performance of an organization but these are not taken into account in the literature selection because their primary focus does not fit this specific research. Discussed literature that provides a best practice roadmap for the definition and implementation of strategic performance measures is Assiri et al.'s roadmap (Assiri et al. 2006). Two additional models that can support the definition and implementation process are Fornell's customer satisfaction model, (Fornell et al. 1996) and Daft's framework for assessing the level of environmental uncertainty, (Daft 2001).
c)	*Which model is selected from literature for application to eBuddy to define and implement strategic performance measurement?* The balanced scorecard of Kaplan & Norton is selected as model for application in this research based on a fit with the research focus and scope, a comprehensive set of guidelines for definition and implementation of strategic performance measurement, the fact that eBuddy management is familiar with the model and the extensive literature attention that supports the model.

d)	*What is a roadmap to define and implement strategic performance measurement by the selected literature model from best practices?* Based on the roadmap identified by Assiri et al. (Assiri et al. 2006), an eBuddy balanced scorecard was identified. The roadmap from Assiri et al. is currently the most comprehensive available in literature researching the best practice experiences from a large number of companies differing in location, sector and size. Furthermore, the research is recently carried out, which indicates that the results are applicable to the current organizational environment. The eBuddy balanced scorecard roadmap consists of 20 success factors which are expected to influence the balanced scorecard identification and implementation. Those factors are divided in three levels, dominant, main and supporting factors. For each factor, specific implementation guidelines are defined. See Section 2.2 for the specific contents of the roadmap. Two additional applied models that support the definition and implementation process defined by this roadmap are Fornell's customer satisfaction model, (Fornell et al. 1996) and Daft's framework for assessing the level of environmental uncertainty, (Daft 2001).
2)	What is eBuddy's strategy?
a)	*What is eBuddy's defined strategy by management?* eBuddy's corporate-level strategy is to "Offer simple to use, reliable products with market unique features that provide instant messaging for everyone everywhere". By applying its corporate-level strategy, eBuddy management wants to build a growing company with a growing company value, to satisfy its shareholders. eBuddy's business-level strategy per each of the five business units is: 1) Product management: design products that offer instant messaging for everyone everywhere that answer a market need in markets with high growth potential; 2) Development: develop the products designed by product management and gain a superior level of knowledge and experience in the fields of instant messaging networks, hardware devices capable of connection to the internet and software developing technologies; 3) Operations: gaining operational excellence, assuring that eBuddy's products ready to use at all time; 4) Sales: maximize the revenue generated from online advertisement publishing within the eBuddy products; 5) Marketing: maximize the level of viral marketing and media coverage on eBuddy as a company and its products.
b)	*What are management's motives and believes behind the strategy?* 1) eBuddy wants to grow company value; a) The determinants of company value for eBuddy are the number of product users, the revenue generated and the amount of media coverage; b) Company value for eBuddy is a combination of the three determinants. 2) eBuddy wants to increase its level of viral marketing to acquire new product users: a) The level of viral marketing can be increased by increasing product user satisfaction; b) Product user satisfaction is defined in a product user satisfaction model by the application of a customer satisfaction model (Fornell et al. 1996). 3) eBuddy's revenue is dependent on: a) The number of product users; b) The level of product usage; c) The amount of advertisements sold. 4) eBuddy is facing a high level of environmental uncertainty.

3	*What is available in-house data for the calculation of strategic performance measures?* 1) eBuddy data warehouse: The data warehouse stores all in-house available data concerning product users and online advertisement publishing. The exact contents of the data warehouse are modelled in an entity relationship diagram in Appendix 5 and summarized in Section 5.2.1. 2) Site compensation report: Excell spreadsheet that provides an overview of the daily generated revenue. 3) Vocus PR information system: Accessible through a website and provides an overview of all worldwide media publications. 4) eBuddy user interface flow chart: Provides an overview of the actions a product user has to take to reach product functionality. 5) Google blog search Service that makes it possible to search worldwide blogs based on keyword. 6) In-house Wiki website Compares that eBuddy product functionalities with that of competitors. 7) eBuddy blog Provides an overview of blog posts by eBuddy employee's and blog comments by product users.
4	*What are strategic performance measures for eBuddy?* 1) eBuddy's organizational strategy, management's visions and motives lead to strategic objectives through the whole organization as defined in the eBuddy strategy map in Figure 11; 2) The different strategic objectives all contribute to the overall organizational strategy by cause-and-effect relationships as defined in the eBuddy strategy map in Figure 11; 3) Based on the eBuddy strategy map and available in-house data for the calculation of strategic performance measures, eBuddy's balanced scorecard is defined in Section 5.7; 4) eBuddy's balanced scorecard identifies a set of 19 strategic performance measures for eBuddy. This strategic performance measurement system provides a complete and founded view on eBuddy's strategic performance and reflects common objectives by being aligned with eBuddy's strategy. Furthermore, it facilitates efficient strategic decision support by providing a small group of measurable, meaningful, and accurate performance measures. The identified measures are currently available from data within eBuddy, corresponding the research preconditions (see 1.2.3). eBuddy's balanced scorecard is not complete. For the employee skills objective, no strategic performance measure could be identified. This missing measure is purely a performance driver, and not also an outcome measure, which makes the impact of this missing measure within the scorecard limited. Because the missing measurement is not crucial for the balanced scorecard to be used, the scorecard will be implemented without a measure for the employee skills objective. Clear recommendations on how eBuddy should cope with this fact are made in Chapter 7.

5	*How can eBuddy implement the defined strategic performance measurement?* Based on the eBuddy balanced scorecard roadmap in Section 2.2 and the steps already taken in the definition component of this research, an implementation roadmap is identified in Section 6.1. This roadmap consists of 12 main and supporting success factors which are expected to influence the balanced scorecard implementation. The steps in the implementation roadmap are carried out, which finalizes the implementation of strategic performance measures for eBuddy within research scope. With the eBuddy balanced scorecard as a starting point, the sources of data are identified, the database queries to gather necessary data from the data warehouse are created and the balanced scorecard is made usable through an Excel spreadsheet which functions as proof of concept. A timeframe for regular reporting is set to one calendar month, which enables benchmarking of the balanced scorecard results. The balanced scorecard spreadsheet can now be used by eBuddy management to asses the company's monthly strategic performance and to benchmark this performance with past results and results of competitors. The final deliverables of this research are eBuddy's strategy map, balanced scorecard, overview of data sources and database queries and proof of concept balanced scorecard spreadsheet. These deliverables answer the research objective by providing eBuddy with strategic performance measures and the means to make these accessible to management.

Table 13: Answers on research questions

The preconditions of this research, short term fulfilment of the need for strategic performance measurement and calculation of measures with data available currently in-house are met. The measures were all identified based on the current availability of data with a focus on identifying the best available measure at this point in time. The strategic performance measures are identified, implemented and usable for management as deliverables of this research. The missing measure of the employee skills objective was not identified as show stopper for the implementation of the balanced scorecard. This missing measure has a limited impact on the total contents of the balanced scorecard, is not critical for the calculation of other measures and therefore it was acceptable to continue implementation without this measure to fulfil the short term need of strategic performance measurement for eBuddy.

7.2 Recommendations

This section highlights the recommendations to eBuddy management from this research. The recommendations are prioritized in Section 7.2.8.

7.2.1 Implement process and assign responsibilities

The first step in the usage of the balanced scorecard should be to implement a necessary regular reporting process and to assign responsibilities among employees who will carry out this process. This process is outlined in Figure 17.

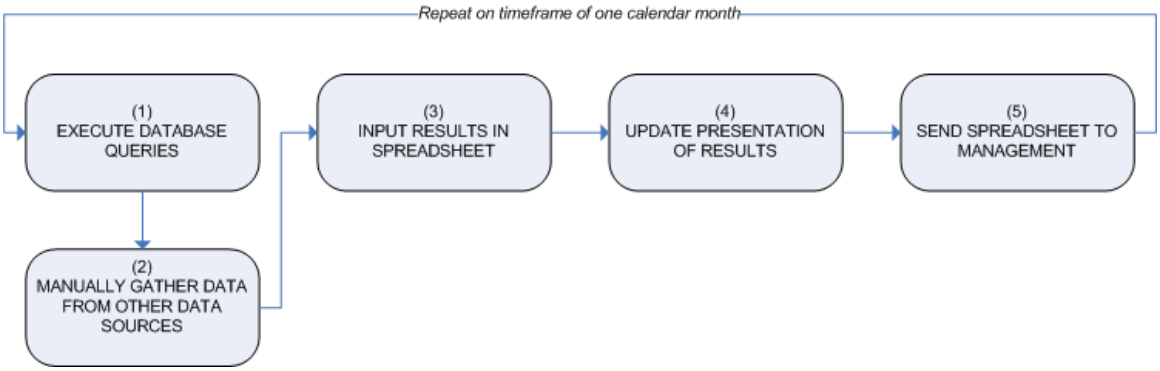


Figure 17: balanced scorecard regular reporting process

As mentioned in Section 6.4, the data for the calculation of the scorecard should be partly manually gathered and database queries have to be initiated and the results gathered. The results have to be added in the balanced scorecard spreadsheet where the strategic performance measures are calculated and presented. In the spreadsheet the presentation of the results has to be updated, before the monthly results of the strategic performance can be sent to management.

Management should assign a responsible employee who will carry out this balanced scorecard regular reporting process on a monthly basis.

7.2.2 Corporate alignment

Management should assess eBuddy's strategic performance from the results of the balanced scorecard measures. These measures provide a complete and founded view on eBuddy's strategic performance and reflect common objectives by being aligned with eBuddy's strategy. Furthermore, they facilitate efficient strategic decision support by providing a small group of measurable, meaningful, and accurate performance measures.

Strategic initiatives should be aligned with strategic objectives identified in the balanced scorecard. The eBuddy strategy map reflects al strategic objectives through the organization and therefore the results strategic initiatives can be measured by the balanced scorecard measures.

7.2.3 Balanced scorecard updating

The eBuddy strategy map, balanced scorecard and strategic performance measures will require updating over time. Management has to expect a number of changes in the measures of each perspective and also the objectives in each perspective might require changes due to sudden changes in internal or external environment. If eBuddy modifies parts of its strategy, objectives and measures have to be updated to fit the new strategy.

eBuddy is facing a high level of environmental uncertainty (see Section 3.3.5). There are a large number of external elements that have a big influence on eBuddy's environment, and these elements change frequently and unpredictable. As a consequence, eBuddy's balanced scorecard requires frequent updating. Assiri et al. highlight that the balanced scorecard measures should be evaluated and reviewed at least once a year (Assiri er al 2006), see Appendix 3.

eBuddy's balanced scorecard should be updated based on three triggers:

1) Any major change in the external or internal environment;
2) Any change in the company's strategy;
3) An evaluation and review at least once a year.

7.2.4 Problem solving and action planning

The balanced scorecard can assist eBuddy in problem solving processes and provide action planning, outlined in Figure 18.

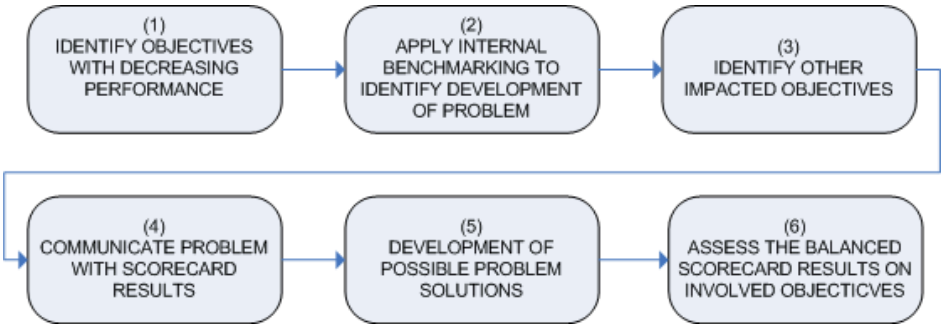


Figure 18: Problem solving and action planning with the balanced scorecard.

Based on the balanced scorecard results, management can identify strategic objectives where performance is decreasing. The balanced scorecard spreadsheet facilitates internal benchmarking since the results per objective can be compared with past results. This internal benchmarking highlights the development of a problem over time on performance. The scorecard can identify other strategic objectives which performance is impacted by a certain problem supported by the cause-and-effect relationships in the eBuddy strategy map.

The balanced scorecard can be used to communicate and develop common understanding of the problem. When there is common understanding of a problem, possible solutions can be developed and applied. The balanced scorecard results can be used to signify that a solution has been found when the performance of the involved objectives is at a desired level again.

Using the balanced scorecard for problem solving and action planning would provide eBuddy with a structured approach and means to communicate a problem. Currently such an approach is not present; therefore eBuddy should use the balanced scorecard for problem solving and action planning.

7.2.5 Define and measure employee skills

Employee skills are the set of different skills among staff. Within eBuddy the staff skills are currently not defined. Without this definition, it is not possible to measure employee skills within eBuddy. As a consequence, eBuddy's balanced scorecard is incomplete.

eBuddy's strategy map (see Section 4.1) identifies employee skills as one of the two objectives in the learning and growth perspective. This employee skills objective has cause-and-effect relationships with all five objectives in the internal business process perspective and a measure for employee skills would therefore be a performance driver.

Objectives in the learning and growth perspective of the balanced scorecard identify the infrastructure that the organization must build to create long-term growth and improvement. Performance drivers are lead indicators that signal to all organization participants what they should be doing today to create value in the future (Kaplan & Norton 1996). This indicates that the eBuddy's performance on the employee skills objective crucial for its long-term growth and improvement. Without defining a measure for employee skills, eBuddy is not measuring one crucial strategic performance measure. Therefore, eBuddy should take the necessary steps to identify such a measure. The recommendations for steps to take are outlined in Figure 19.

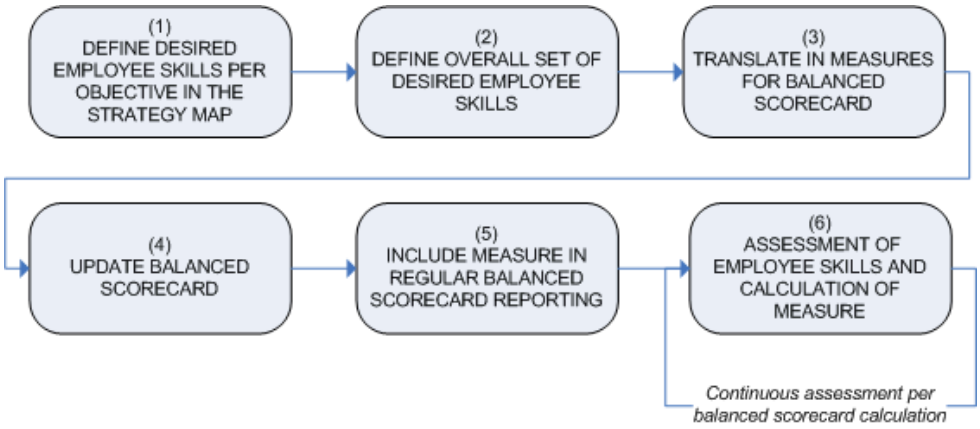


Figure 19: Steps to define and measure employee skills

The first step for this identification is to define a set of overall desired employee skills. eBuddy management has to decide on the of employee skills it needs in-house in order to execute its strategy. The defined eBuddy strategy map can assist in this process. The strategy map highlights the different objectives eBuddy wants to perform on to execute its strategy. Per objective in the strategy map, a set of desired employee skills can be defined. The different sets of skills per each objective together define the total set of desired employee skills.

After the definition of the total set of desired employee skills, this should be translated in measures for eBuddy's balanced scorecard. A possible measure is to count the number of employees that possess a certain skill, for each of the identified skills. The balanced scorecard and balanced scorecard spreadsheet should be updated by adding this new measure.

If the balanced scorecard is updated, the employee skills measure should be included in the regular reporting with the balanced scorecard. The current staff should be individually assessed according to these skills and the employee skills measure has to be calculated. This assessment has to be carried out continuously for every time the balanced scorecard measures are calculated, on the identified timeframe for regular reporting of one calendar month. It will not be necessary to re-assess the skills of each individual employee on a monthly basis, since these skills will not change every month.

Currently new employees are hired within eBuddy in a fast pace, so this assessment should focus on identifying the skills of newly hired employees and their contribution to the total number of skills in-house.

With these steps taken, the eBuddy balanced scorecard and strategic performance measures are complete.

7.2.6 Implementation through organization

Assiri et al. clearly recommend that the balanced scorecard should be implemented through the whole organization in their roadmap (Assiri et al. 2006), see Appendix 3. However, as indicated in Section 2.2.1, eBuddy's company size was not well represented in their research. The value of implementing a balanced scorecard though a whole organization is that it creates a common understanding of strategic objectives and everyone's contribution to the overall company strategy. Furthermore, it facilitates problem solving and action planning, as outlined in Section 7.2.4.

The disadvantage of implementing a balanced scorecard through the whole organization is that it might raise internal confidentiality issues[38]. Within eBuddy, not all employees are for example informed of the company's revenue. Furthermore, not all employees are informed of the exact performance of other business units. Since eBuddy has 30 employees, the performance of a business unit is the responsibility of only a few, or sometimes even one, employee. eBuddy currently does not inform all its employees about the total performance of all business units, since this may create a culture where employees are individually assessing each others performance. Within eBuddy, this is identified as the role of the business unit director and management.

Implementation through the whole organization is currently not recommended for eBuddy, since it raises confidentiality issues and has an undesired impact on the company culture. However, the balanced scorecard can provide added value within eBuddy by creating a common understanding of strategy and facilitating problem solving and action planning, if it is implemented through lower organizational levels than management. eBuddy should implement the balanced scorecard in two phases. In the first phase, the scorecard will be used by management to gain experience with the balanced scorecard strategic performance measurement.

In the second phase, the scorecard should also be introduced to the directors of each of the five business units within eBuddy. Hereby the scorecard can be used to create common understanding of strategy and each contribution to the overall strategy among business units. It can also be used for problem solving and action planning since the business unit directors and management can together review the performance of each strategic objective. By only involving business unit directors, and not all employees, the scorecard can provide optimal added value for eBuddy without raising confidentiality issues[39] and having an undesired effect on the company culture.

Assiri et al.'s roadmap also identifies the linkage of balanced scorecard results with employee rewards as success factor for a balanced scorecard implementation (Assiri et al. 2006), see Appendix 3. Since this would have a great impact on eBuddy's human resource policies, the possibilities and consequences of this are subject of future research. eBuddy management has to decide if it wants to link balanced scorecard results with employee rewards after it gained thorough experience with balanced scorecard usage and the impact of such a decision is analyzed.

[38] This typically holds for any organization, but this can be prevented by defining an organizational balanced scorecard which is cascaded in business unit and departmental scorecards. In the future, as eBuddy grows in organizational size this is an option to solve confidentiality issues. In the current situation this cascading will not be applied.
[39] Currently, the business unit directors are already informed of the performance of other business units.

7.2.7 Development of information system

The balanced scorecard spreadsheet developed in this research is a proof on concept. For the first phase of implementation, where only management uses the scorecard, this spreadsheet is sufficient. For the second phase, a new balanced scorecard information system has to be developed. This information system should be based on the functionality already present in the balanced scorecard spreadsheet. Besides this functionality, the most important criteria for this information system are:

1) Automation of the execution of the database queries, storage of the results and calculation of the measures;
2) Presentation of the balanced scorecard to multiple users at different locations by a web interface. By using a web interface the scorecard is accessible to all involved employees, independent of their location, without the need for software installation.

The possibilities of automation of the gathering from the data sources[40], storage of the results and calculation of the measures should be researched. As mentioned in Section 6.4, this automation creates a direct dependency between the balanced scorecard information system and the presentation of information in these data sources. The research of this automation should focus on the technical possibilities for automation and the impact of this dependency. From the conclusions of this research, management has to decide whether or not to fully automate this data gathering.

7.2.8 Recommendation priorities

The recommendations from this research to eBuddy management are prioritized according Table 14.

Recommendation	Explanation
1) Implement balanced scorecard regular reporting process and assign responsible employee	Without this step, management can not use the identified and implemented strategic performance measures.
2) Corporate alignment	This is the actual usage of the scorecard by management and alignment with strategic initiatives.
3) Balanced scorecard updating	This updating assures that the strategic performance measures remain accurate.
4) Define and measure employee skills	This step completes the strategic performance measures and has to be finished before the scorecard is introduced to the business unit directors. This step is preceded by the three steps necessary to start using the scorecard by management, to fulfil the short term need of strategic performance measurement.
5) Development of information system	Before the balanced scorecard can be introduced through the organization, an information system has to be developed.
6) Implement through organization	The balanced scorecard can now be introduced to the business unit directors, with the new developed information system.
7) Problem solving and action planning	The scorecard can now be used to facilitate problem solving and action planning among management and business unit directors.

Table 14: Priorities of recommendations

[40] The site compensation report, Vocus PR information system, eBuddy user interface flow chart, Google blog search, in-house Wiki website and eBuddy blog

7.3 Research evaluation

This section evaluates the findings from the steps taken in this research. The definition of research objectives, faced scepticism, application of the roadmap and research planning are evaluated.

7.3.1 Definition of research objectives

The motivation behind this research was management's question on how to get more information from the in-house data warehouse. Management was convinced there were possibilities to extract more information to support strategic decision making.

Instead of focussing on the data warehouse and researching the information that could be withdrawn, the choice was made to set the research focus on the information need from eBuddy management. As management itself indicated, it was looking for a way to improve its strategic decision support. A focus on the data warehouse would focus on the information available, instead of on the information that was really needed.

From the definition of the strategic performance measures, only half of the measures could be extracted from the data warehouse. The data warehouse proved to provide insufficient information to assess eBuddy's strategic performance and provide solid and efficient decision support. The focus on the information need provided eBuddy with a complete set of strategic performance measures and recommendations on which information to start gathering that is currently not available in-house.

7.3.2 Balanced scorecard scepticism

Initially, management faced the definition and implementation of the balanced scorecard with a level of scepticism. It questioned the usability of such a performance measurement model on a small internet company like eBuddy. Management underlined the proven value of the scorecard for traditional big multinational companies, but questioned if the model would be too inflexible and its scope to broad to provide real added value for eBuddy, since it is a small company facing a high level of environmental uncertainty (see Section 3.3.5).

Despite the scepticism, the balanced scorecard was still identified as model to define eBuddy's strategic performance measures. Of the available literature, it provided the most comprehensive set of guidelines on how to define measures and no other model was available that was specifically aimed at small companies in the internet sector.

Through this research, the scorecard proved to be applicable to eBuddy. It was capable of identifying a complete set of strategic performance measures, aligned with the company's strategy and different strategic objectives through the organization. Furthermore, the results of the model application indicated shortcomings on eBuddy's information currently available in-house to assess its strategic performance and support strategic decision making solid and efficient.

7.3.3 Application of balanced scorecard roadmap

The balanced scorecard roadmap identified by Assiri et al. was applied in this research (Assiri et al. 2006). The location of eBuddy is well represented in the researched firms, but the company size and sector are not. However, the choice was made to still include the roadmap in this research to utilize the lessons learnt by other companies from balanced scorecard definition and implementation. No other model was available that was specifically aimed at small companies in the internet sector.

The roadmap was very useful during this research, providing a solid set of guidelines on steps to take in the definition process to the final implementation of the balanced scorecard. The only elements of the roadmap that were less applicable on a small organizational size were the success factors that focus on the implementation of the scorecard through all levels of an organization, see Section 2.2. eBuddy is a flat organization with no real different organizational levels, limited to business units and their directors. Therefore, the detailed recommendations of the roadmap on how to cascade the scorecard through various organizational levels and gain employee commitment through each level were not applicable to eBuddy. These recommendations were excluded from the roadmap to define a roadmap specific for eBuddy.

The fact that the internet sector of eBuddy was not well represented in Assiri et al.'s research did not lead to any shortcomings or difficulties for the application of this roadmap. The presented recommendations were designed to be generalizable for organizations in any sector (Assiri et al. 2006). This proved to be the case for this application to eBuddy in an internet sector.

The defined balanced scorecard that was applicable to eBuddy's organizational size and sector consisted of 20 of the original 27 success factors. Hereby, 75% of the Assiri et al.'s roadmap was usable is this research.

7.3.4 Research planning

The time distribution of the main steps taken in this research was divided as follows:

- 50% for the definition of eBuddy's strategy map;
- 20% for the definition of strategic performance measures in eBuddy's balanced scorecard;
- 20% for the analysis of available in-house data and definition of database queries;
- 5% for the creation of a proof of concept Excel spreadsheet;
- 5% for the definition of recommendations.

The most time consuming part of this research was the definition of eBuddy's strategy map. This definition is crucial for the research results, since it impacts all contents of the balanced scorecard and strategic performance measures. To define a complete and solid strategy map, a very clear view on the company's strategy is needed. This view was created by conducting interviews and evaluating the results. More than expected, the process of coming to solid conclusions on eBuddy's strategic objectives was very time consuming. The detailed strategy questions lead to an extensive amount of discussion. Especially since eBuddy is a young company, strategy is not formally defined to a large level of detail. The final definition of strategic objectives through the organization was time consuming, but this is a valuable process for any organization. The process of defining a strategy map stimulates an organization to clearly define its strategy, strategic objectives and relationships between objectives. The relationships between objectives highlight how each part of an organization contributes to the overall strategy, which is very valuable insight for any organization.

Following the strategy map definition, the definition of the balanced scorecard and strategic performance measures was a fairly straightforward process. Once the available in-house data was analyzed, for each objective set in the strategy map measures could be defined by focusing on the best available information at this point in time.

7.4 Research contribution

This section highlights the contribution of this research to eBuddy and the academic value in general.

7.4.1 Contribution to eBuddy

The contribution of this research to eBuddy is that the deliverables provide a strategic performance measurement system, which was not present within eBuddy preceding this research.

The identified strategic performance measures provide a complete and founded view on eBuddy's strategic performance and reflect common objectives by being aligned with eBuddy's strategy. Furthermore, they facilitate efficient strategic decision support by providing a small group of measurable, meaningful, and accurate performance measures.

The identified strategy map provides a clear overview of the important strategic objectives through the organization, the relationships between objectives and indicates how different objectives contribute to the overall organizational strategy. This strategy map is a mean to create a common understanding of strategy and everyone's contribution to the strategy among employees. The strategy map also is a starting point of recommended future research.

The created database queries and proof of concept Excel spreadsheet provide eBuddy management with the means for immediate usage of the strategic performance measures.

The recommendations made in this research provide eBuddy with clear guidelines on which steps to take from now to gain added value from the balanced scorecard implementation. The recommendations also identified shortcomings in the data currently available for the calculation of crucial strategic performance measures and identify the necessary steps to take to overcome these shortcomings.

7.4.2 Academic value

The academic value of this research is two fold. First, it provides a case study of the application of a balanced scorecard to a small company in the internet sector. Second, it provides a case study of the application of Assiri et al.'s balanced scorecard definition and implementation roadmap to a small company in the internet sector.

Preceding this research, the successful application of the balanced scorecard and the roadmap for a small internet company like eBuddy was under question among stakeholders. Both the balanced scorecard and roadmap literature do not provide assurance that the models are applicable for any organization with a small number of employees and presence in the internet sector. Despite the lack of this assurance, the choice was made within this research to still apply both models, with success.

This research provides a case study which can be translated to general recommendations for smalls companies in the internet sector. These companies typically have two characteristics in common:

1) During their first years of existence, most internet companies are of small company size. The internet sector provides the possibilities to start-up a company with a limited amount of resources and employees;
2) Internet companies face a high level of environmental uncertainty.
   The internet sector is known for its continuous, fast and unpredictable development, stimulated by the fast pace developments in the information technology, telecommunications and computer hardware sectors. Furthermore, internet companies immediately face global competition from start-up. Services offered by internet companies are border-spanning; every internet company with a website can offer its services to a worldwide customer base.

Exactly these two characteristics, which also hold for eBuddy, created the question if it would be possible to apply the balanced scorecard model and definition and implementation roadmap in this research (see Section 7.3.2). This research presents a case study in which these two characteristic did not stand in the way of a successful balanced scorecard definition and implementation:

1) Despite the small company size:
   a. No limitations were faced on the definition of the balanced scorecard.
      Every organization, independent of its company size, can be viewed from the four perspectives of the balanced scorecard (Kaplan & Norton 1996).
   b. 75% percent of the Assiri et al. roadmap was useable.
      The other 25% was primarily focused on the implementation through several organizational levels. The main part of this roadmap provided added value for the identification of steps to take for the definition and implementation of a balanced scorecard.
2) Despite the high level of environmental uncertainty:
   a. No limitations were faced on the definition of the balanced scorecard.
      A high level of environmental uncertainty does not impact the definition or implementation of the balanced scorecard, but only the timeframe in which updating of the balanced scorecard might be required. A fast changing and uncertain environment can require a more regular updating of the balanced scorecard if it creates changes in the company's strategic objectives, but does not limit the balanced scorecard usability.
   b. The Assiri et al. roadmap was usable without limitations.
      The only impact of high level of environmental uncertainty on the roadmap is that this fact may require a more regular updating of the balanced scorecard than the mentioned year timeframe.

Two recommendations from this research to small companies in the internet sector are:

1) Define and implement strategic performance measurement;
   Strategic performance measurement provides solid and efficient strategic decision support. Especially for internet companies, facing a high level of environmental uncertainty, it is crucial to response rapidly to the fast changing environment. Strategic performance measurement provides the needed decision making support to realize this fast response. Furthermore, it can offer a problem solving and action planning tool and can be used to create a common understanding of strategy and contribution of different objectives through the organization to the overall strategy.

2) Take the balanced scorecard into account for the selection of a specific strategic performance measurement system;
   The case study provided by this research shows an example of a successful implementation of the balanced scorecard for a small company the internet sector. Both the company size and sector did not provide any limitations to the definition and implementation of the balanced scorecard.
   When the balanced scorecard is selected as specific strategic performance measurement system, use Assiri et al.'s roadmap to define the steps to take for the definition and implementation process (Assiri et al. 2006). This roadmap provides a clear overview of steps to take towards a successful implementation. The case study provided by this research shows an example of a successful application of this roadmap for a small internet company. The major part of this roadmap was usable for a small internet company.

7.5 Recommendations for future research

The section highlights the recommendation for future research from the results of this research.

7.5.1 Correlation of company value determinants

eBuddy's strategy map highlight the determinants of company value for eBuddy; product users, revenue and media attention. The level of contribution of each individual determinant of the final company value is yet unknown. A valuable future research would investigate the correlation between company value and each of these individual determinants. The outcome of the research, the level of contribution of each individual determinant on company value, would assist eBuddy management in the evaluation of its strategic objectives, which is necessary to assure the continued correctness of eBuddy's balanced scorecard.

7.5.2 Possibilities for improved product user interaction

As highlighted in the eBuddy strategy map, product user interaction is an important objective to create the infrastructure that eBuddy must build to create long-term growth and improvement. This product user interaction is currently limited to a blog website were eBuddy employees and product users interact. A valuable future research would investigate other possibilities and opportunities to extend this product user interaction, which would contribute to the overall company strategy.

7.5.3 Evaluation of data warehouse contents

The original starting point of this research was management's question which valuable information could be extracted from the internal data warehouse to support strategic decision support. Of the final 19 identified strategic performance measures, 10 measures can be calculated from data present in the data warehouse (see Section 6.2). The other 9 measures had to be gathered from other sources of data. This fact brings up two questions:

1) Is eBuddy storing a large amount of data in the data warehouse that is not useful?
   Future research should investigate were all data stored in the data warehouse that is not useful for the calculation of the strategic performance measures is used within the organization.
2) Can the data for the calculation of the other 9 measures be included in the data warehouse?
   Future research should investigate if this data can be stored and updated in the data warehouse to become independent of changes in external data sources.

The outcome of this research would be a new design of the data warehouse in which unnecessary data is excluded and where a recommendation is made on the storage and updating of all data for the calculation of the strategic performance measures in the data warehouse.

7.5.4 Case study research for small internet companies

As mentioned in Section 7.4.2, two recommendations from this research to small internet companies are to define and implement a strategic performance measurement and to take the balanced scorecard into account in the selection of a specific system. When implementing the balanced scorecard, Assiri et al.'s roadmap is recommended to support this process. These recommendations are based on the case study presented by this research. However, the complete validity of these recommendations can not be proven by this single case study. Therefore, subject of valuable future research would be to gather case studies of the definition and implementation of strategic performance measurement systems, including the balanced scorecard, in small internet companies. With these case studies, an evaluation of the validity of the recommendations can be made and more extended recommendations on how small internet companies can utilize strategic performance measurement can be defined.

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Appendix 1: eBuddy products

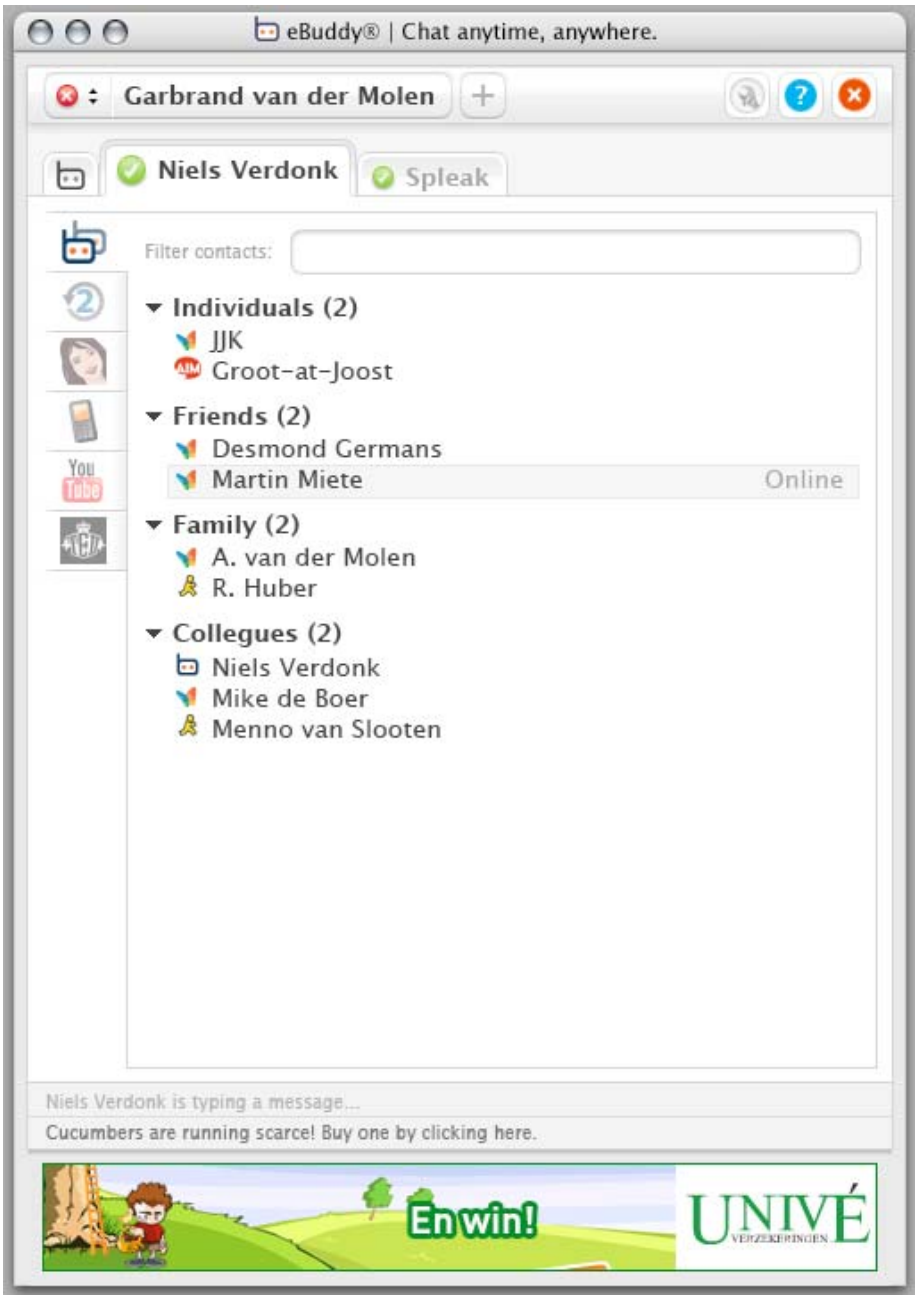


Figure a1-1: eBuddy Web messaging contact list

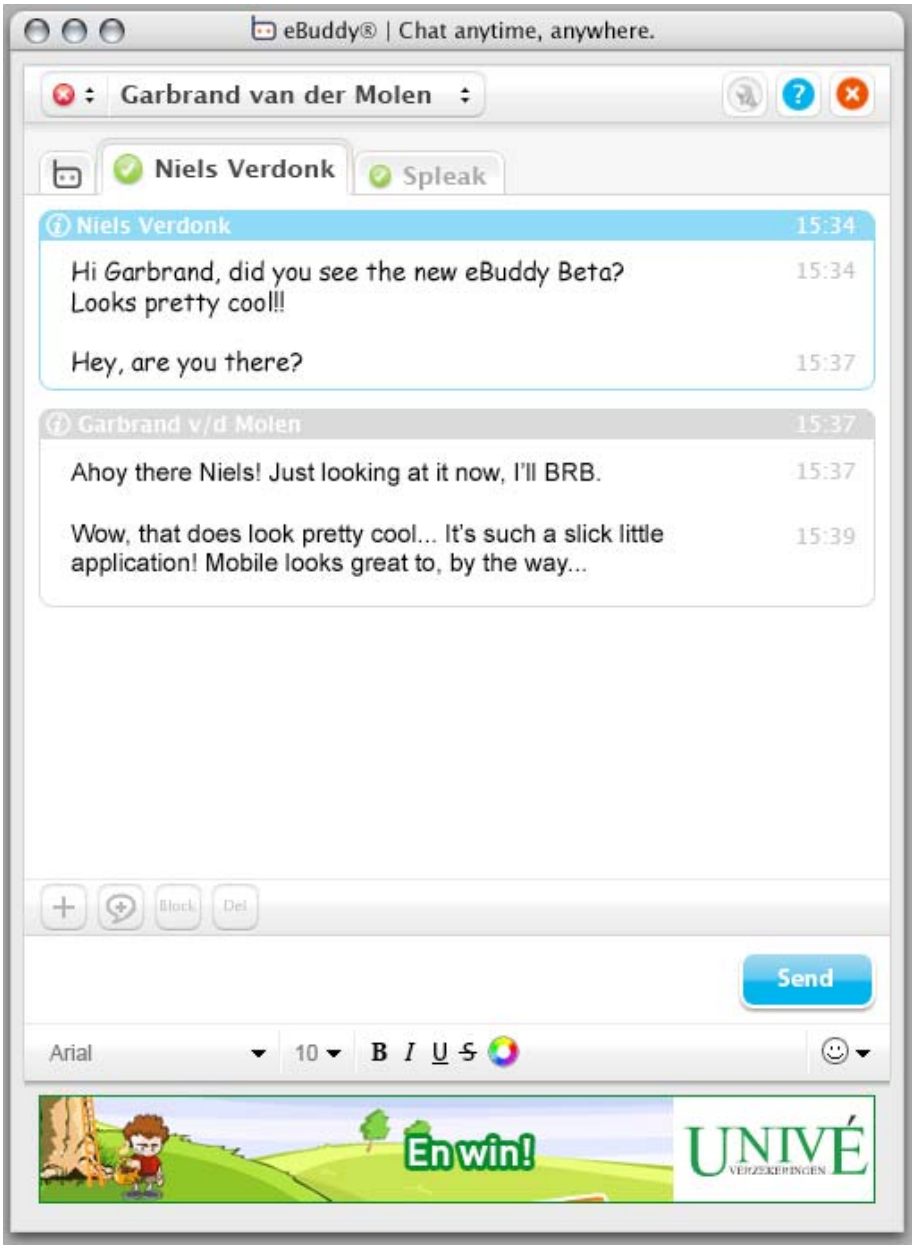


Figure a1-2: eBuddy Web messaging chat

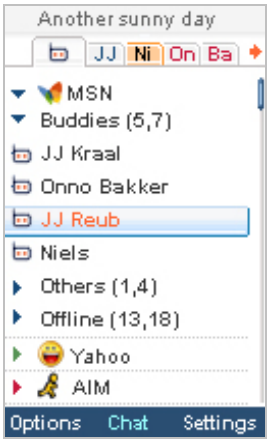


Figure a1-3: eBuddy Mobile messaging contact list

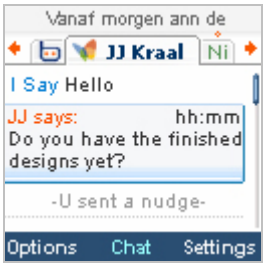


Figure a1-4: eBuddy Mobile messaging chat

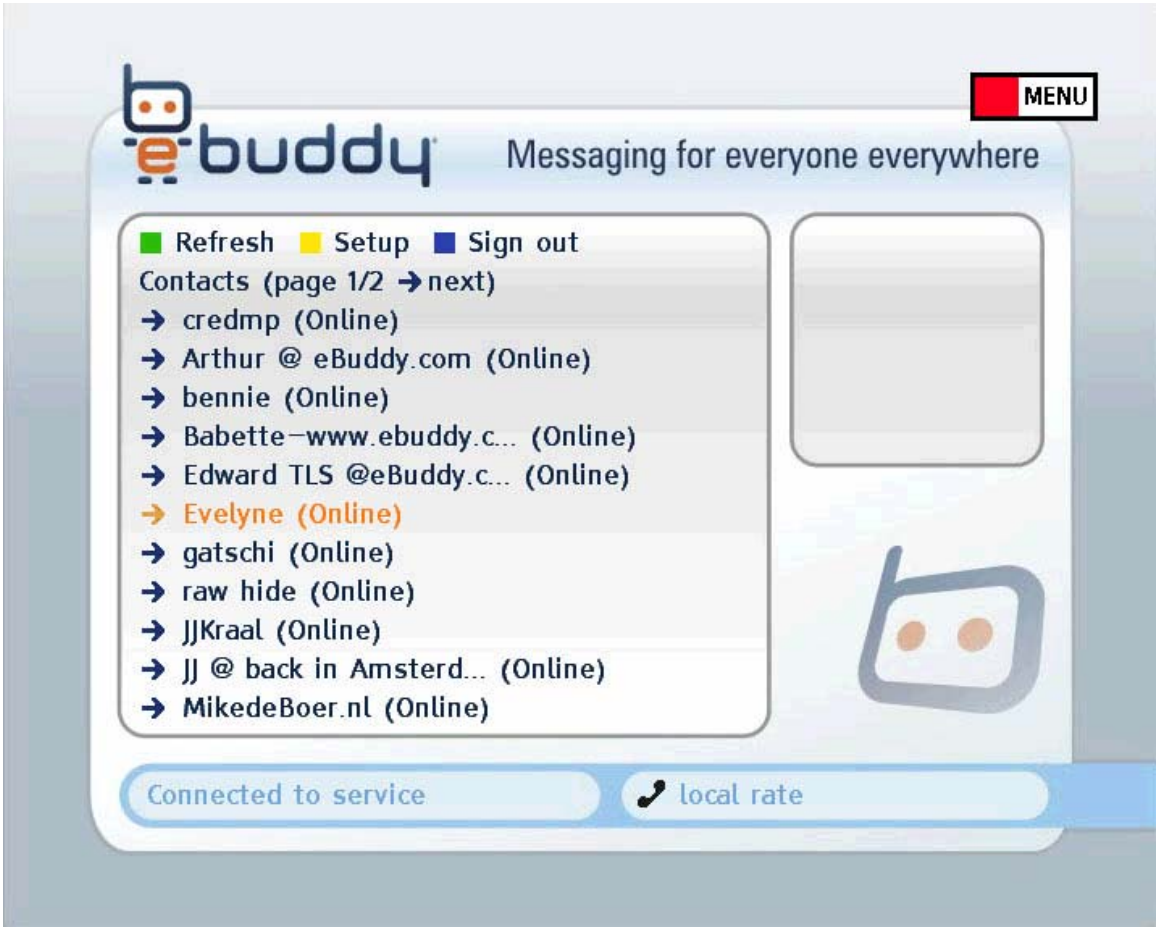
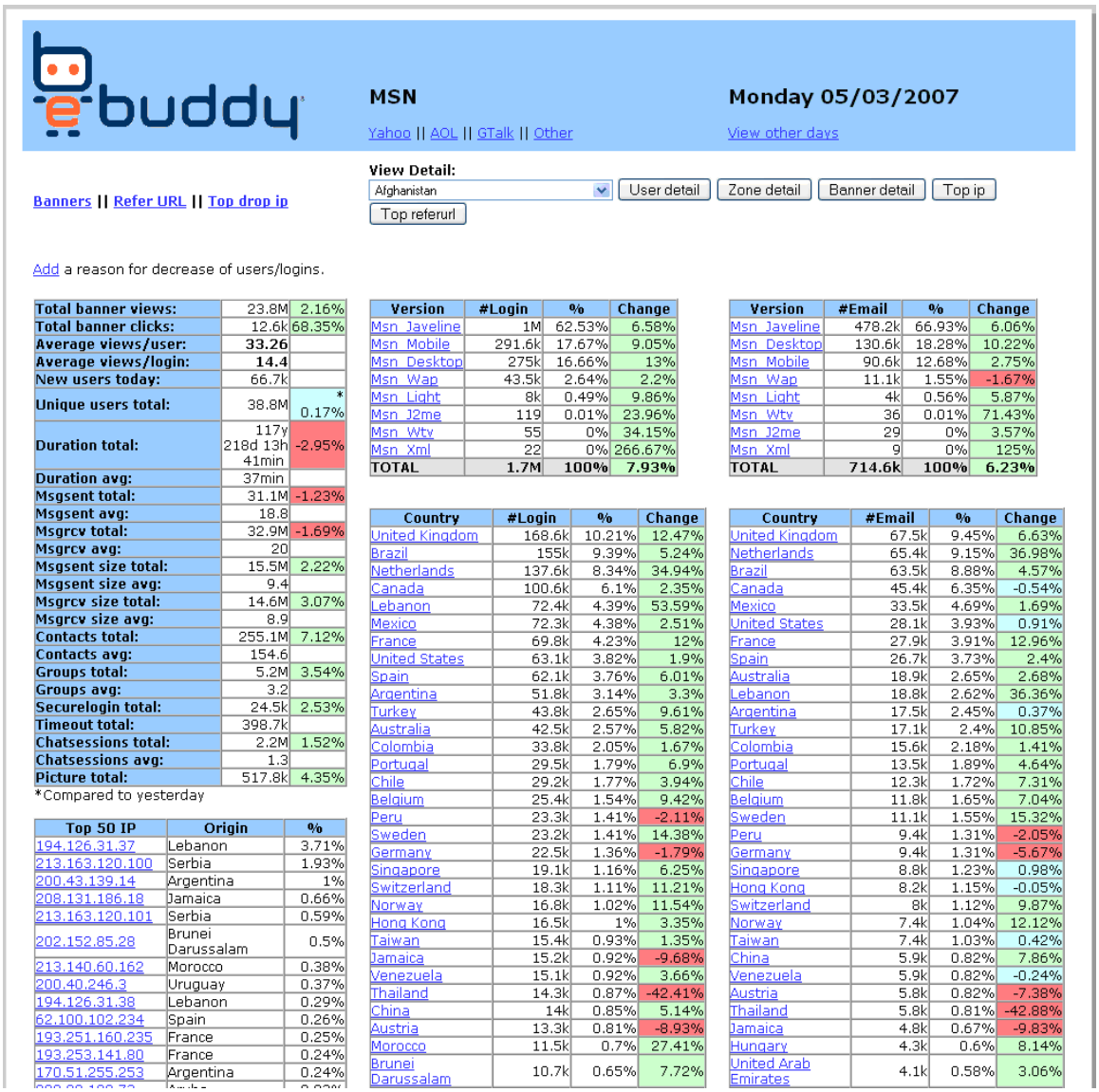


Figure a1-4: eBuddy TV messaging contact list

Appendix 2: Information systems



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Total banner clicks:	12.6k	68.35%
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Average views/login:	14.4	
New users today:	66.7k	
Unique users total:	38.8M	* 0.17%
Duration total:	117y 218d 13h 41min	-2.95%
Duration avg:	37min	
Msgsent total:	31.1M	-1.23%
Msgsent avg:	18.8	
Msgrcv total:	32.9M	-1.69%
Msgrcv avg:	20	
Msgsent size total:	15.5M	2.22%
Msgsent size avg:	9.4	
Msgrcv size total:	14.6M	3.07%
Msgrcv size avg:	8.9	
Contacts total:	255.1M	7.12%
Contacts avg:	154.6	
Groups total:	5.2M	3.54%
Groups avg:	3.2	
Securelogin total:	24.5k	2.53%
Timeout total:	398.7k	
Chatsessions total:	2.2M	1.52%
Chatsessions avg:	1.3	
Picture total:	517.8k	4.35%

*Compared to yesterday

Top 50 IP	Origin	%
194.126.31.37	Lebanon	3.71%
213.163.120.100	Serbia	1.93%
200.43.139.14	Argentina	1%
208.131.186.18	Jamaica	0.66%
213.163.120.101	Serbia	0.59%
202.152.85.28	Brunei Darussalam	0.5%
213.140.60.162	Morocco	0.38%
200.40.246.3	Uruguay	0.37%
194.126.31.38	Lebanon	0.29%
62.100.102.234	Spain	0.26%
193.251.160.235	France	0.25%
193.253.141.80	France	0.24%
170.51.255.253	Argentina	0.24%

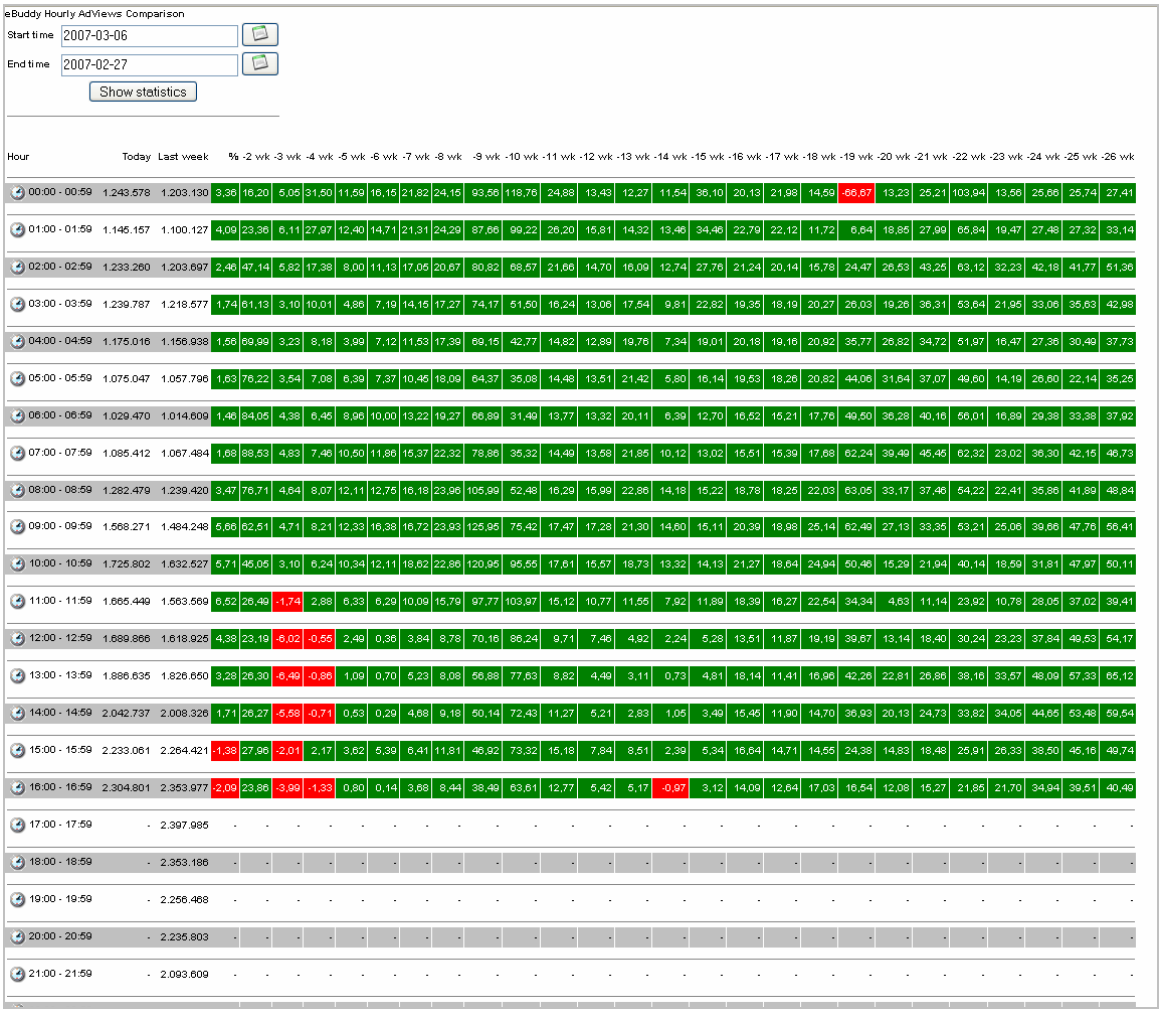
Version	#Login	%	Change
Msn_Javeline	1M	62.53%	6.58%
Msn_Mobile	291.6k	17.67%	9.05%
Msn_Desktop	275k	16.66%	13%
Msn_Wap	43.5k	2.64%	2.2%
Msn_Light	8k	0.49%	9.86%
Msn_J2me	119	0.01%	23.96%
Msn_Wtv	55	0%	34.15%
Msn_Xml	22	0%	266.67%
TOTAL	1.7M	100%	7.93%

Version	#Email	%	Change
Msn_Javeline	478.2k	66.93%	6.06%
Msn_Desktop	130.6k	18.28%	10.22%
Msn_Mobile	90.6k	12.68%	2.75%
Msn_Wap	11.1k	1.55%	-1.67%
Msn_Light	4k	0.56%	5.87%
Msn_Wtv	36	0.01%	71.43%
Msn_J2me	29	0%	3.57%
Msn_Xml	9	0%	125%
TOTAL	714.6k	100%	6.23%

Country	#Login	%	Change
United Kingdom	168.6k	10.21%	12.47%
Brazil	155k	9.39%	5.24%
Netherlands	137.6k	8.34%	34.94%
Canada	100.6k	6.1%	2.35%
Lebanon	72.4k	4.39%	53.59%
Mexico	72.3k	4.38%	2.51%
France	69.8k	4.23%	12%
United States	63.1k	3.82%	1.9%
Spain	62.1k	3.76%	6.01%
Argentina	51.8k	3.14%	3.3%
Turkey	43.8k	2.65%	9.61%
Australia	42.5k	2.57%	5.82%
Colombia	33.8k	2.05%	1.67%
Portugal	29.5k	1.79%	6.9%
Chile	29.2k	1.77%	3.94%
Belgium	25.4k	1.54%	9.42%
Peru	23.3k	1.41%	-2.11%
Sweden	23.2k	1.41%	14.38%
Germany	22.5k	1.36%	-1.79%
Singapore	19.1k	1.16%	6.25%
Switzerland	18.3k	1.11%	11.21%
Norway	16.8k	1.02%	11.54%
Hong Kong	16.5k	1%	3.35%
Taiwan	15.4k	0.93%	1.35%
Jamaica	15.2k	0.92%	-9.68%
Venezuela	15.1k	0.92%	3.66%
Thailand	14.3k	0.87%	-42.41%
China	14k	0.85%	5.14%
Austria	13.3k	0.81%	-8.93%
Morocco	11.5k	0.7%	27.41%
Brunei Darussalam	10.7k	0.65%	7.72%

Country	#Email	%	Change
United Kingdom	67.5k	9.45%	6.63%
Netherlands	65.4k	9.15%	36.98%
Brazil	63.5k	8.88%	4.57%
Canada	45.4k	6.35%	-0.54%
Mexico	33.5k	4.69%	1.69%
United States	28.1k	3.93%	0.91%
France	27.9k	3.91%	12.96%
Spain	26.7k	3.73%	2.4%
Australia	18.9k	2.65%	2.68%
Lebanon	18.8k	2.62%	36.36%
Argentina	17.5k	2.45%	0.37%
Turkey	17.1k	2.4%	10.85%
Colombia	15.6k	2.18%	1.41%
Portugal	13.5k	1.89%	4.64%
Chile	12.3k	1.72%	7.31%
Belgium	11.8k	1.65%	7.04%
Sweden	11.1k	1.55%	15.32%
Peru	9.4k	1.31%	-2.05%
Germany	9.4k	1.31%	-5.67%
Singapore	8.8k	1.23%	0.98%
Hong Kong	8.2k	1.15%	-0.05%
Switzerland	8k	1.12%	9.87%
Norway	7.4k	1.04%	12.12%
Taiwan	7.4k	1.03%	0.42%
China	5.9k	0.82%	7.86%
Venezuela	5.9k	0.82%	-0.24%
Austria	5.8k	0.82%	-7.38%
Thailand	5.8k	0.81%	-42.88%
Jamaica	4.8k	0.67%	-9.83%
Hungary	4.3k	0.6%	8.14%
United Arab Emirates	4.1k	0.58%	3.06%

Figure a2-1: eBuddy Dashboard


eBuddy Hourly AdViews Comparison

Start time 2007-03-06

End time 2007-02-27

Show statistics

Hour	Today	Last week	%	-2 wk	-3 wk	-4 wk	-5 wk	-6 wk	-7 wk	-8 wk	-9 wk	-10 wk	-11 wk	-12 wk	-13 wk	-14 wk	-15 wk	-16 wk	-17 wk	-18 wk	-19 wk	-20 wk	-21 wk	-22 wk	-23 wk	-24 wk	-25 wk	-26 wk
00:00 - 00:59	1.243.578	1.203.130	3,38	16,20	5,05	31,50	11,59	16,15	21,82	24,15	93,56	118,76	24,88	13,43	12,27	11,54	36,10	20,13	21,98	14,59	-66,67	13,23	25,21	103,94	13,56	25,66	25,74	27,41
01:00 - 01:59	1.146.157	1.100.127	4,09	23,36	6,11	27,97	12,40	14,71	21,31	24,29	87,66	99,22	26,20	15,81	14,32	13,46	34,46	22,79	22,12	11,72	6,64	18,85	27,99	65,84	19,47	27,48	27,32	33,14
02:00 - 02:59	1.233.260	1.203.697	2,46	47,14	5,82	17,38	8,00	11,13	17,05	20,67	80,82	68,57	21,66	14,70	16,09	12,74	27,76	21,24	20,14	15,78	24,47	26,53	43,25	63,12	32,23	42,18	41,77	51,36
03:00 - 03:59	1.239.787	1.218.577	1,74	61,13	3,10	10,01	4,86	7,19	14,15	17,27	74,17	51,50	16,24	13,06	17,54	9,81	22,82	19,35	18,19	20,27	26,03	19,26	36,31	53,64	21,95	33,06	35,63	42,98
04:00 - 04:59	1.175.016	1.156.938	1,56	69,89	3,23	8,18	3,99	7,12	11,53	17,39	69,15	42,77	14,82	12,89	19,76	7,34	19,01	20,18	19,16	20,92	35,77	26,82	34,72	51,97	16,47	27,36	30,49	37,73
05:00 - 05:59	1.075.047	1.057.796	1,63	76,22	3,54	7,08	6,39	7,37	10,45	18,09	64,37	35,08	14,48	13,51	21,42	5,80	16,14	19,53	18,26	20,82	44,06	31,64	37,07	49,60	14,19	26,60	22,14	35,25
06:00 - 06:59	1.029.470	1.014.609	1,46	84,05	4,38	6,45	8,96	10,00	13,22	19,27	66,89	31,49	13,77	13,32	20,11	6,39	12,70	16,52	15,21	17,76	49,50	36,28	40,16	56,01	16,89	29,38	33,38	37,92
07:00 - 07:59	1.085.412	1.067.484	1,68	88,53	4,83	7,46	10,50	11,86	15,37	22,32	78,86	35,32	14,49	13,58	21,85	10,12	13,02	15,51	15,39	17,68	62,24	39,49	45,45	62,32	23,02	36,30	42,15	46,73
08:00 - 08:59	1.282.479	1.239.420	3,47	76,71	4,64	8,07	12,11	12,75	16,18	23,96	105,99	52,48	16,29	15,99	22,86	14,18	15,22	18,78	18,25	22,03	63,05	33,17	37,46	54,22	22,41	35,86	41,89	48,84
09:00 - 09:59	1.568.271	1.484.248	5,66	62,51	4,71	8,21	12,33	16,38	16,72	23,93	125,95	75,42	17,47	17,28	21,30	14,60	15,11	20,39	18,98	25,14	62,49	27,13	33,35	53,21	25,06	39,66	47,76	56,41
10:00 - 10:59	1.725.802	1.632.527	5,71	45,05	3,10	6,24	10,34	12,11	18,62	22,86	120,95	95,55	17,61	15,57	18,73	13,32	14,13	21,27	18,64	24,94	50,46	15,29	21,94	40,14	18,59	31,81	47,97	50,11
11:00 - 11:59	1.665.449	1.563.569	6,52	26,49	-1,74	2,88	6,33	6,29	10,09	15,79	97,77	103,97	15,12	10,77	11,55	7,92	11,89	18,39	16,27	22,54	34,34	4,63	11,14	23,92	10,78	28,05	37,02	39,41
12:00 - 12:59	1.889.866	1.618.925	4,38	23,19	-6,02	-0,55	2,49	0,36	3,84	8,78	70,16	88,24	9,71	7,46	4,92	2,24	5,28	13,51	11,87	19,19	39,67	13,14	18,40	30,24	23,23	37,84	49,53	54,17
13:00 - 13:59	1.886.635	1.826.650	3,28	26,30	-6,49	-0,86	1,09	0,70	5,23	8,08	56,88	77,63	8,82	4,49	3,11	0,73	4,81	18,14	11,41	16,96	42,26	22,81	26,86	38,16	33,57	48,09	57,33	65,12
14:00 - 14:59	2.042.737	2.008.326	1,71	26,27	-5,58	-0,71	0,53	0,29	4,68	9,18	50,14	72,43	11,27	5,21	2,83	1,05	3,49	15,45	11,90	14,70	36,93	20,13	24,73	33,82	34,05	44,65	53,48	59,54
15:00 - 15:59	2.233.061	2.264.421	-1,38	27,96	-2,01	2,17	3,62	5,39	6,41	11,81	46,92	73,32	15,18	7,84	8,51	2,39	5,34	16,64	14,71	14,55	24,38	14,83	18,48	25,91	26,33	38,50	45,16	49,74
16:00 - 16:59	2.304.801	2.353.977	-2,09	23,86	-3,99	-1,33	0,80	0,14	3,68	8,44	38,49	63,61	12,77	5,42	5,17	-0,97	3,12	14,09	12,64	17,03	16,54	12,08	15,27	21,85	21,70	34,94	39,51	40,49
17:00 - 17:59	-	2.397.985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18:00 - 18:59	-	2.353.186	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19:00 - 19:59	-	2.256.468	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20:00 - 20:59	-	2.235.803	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21:00 - 21:59	-	2.093.609	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Figure a2-2: eBuddy hourly ad view comparison

Appendix 3: Balanced scorecard roadmap

Dominant, main and supporting success factors of Assiri et al.'s balanced scorecard implementation roadmap (Assiri et al. 2006)

The dominant factors in order of importance are:

1. Identify balanced scorecard perspectives	Choose perspectives that suit the organization's strategy and objectives. Between 3 and 5 perspectives that cover all aspects and activities of the organization. Kaplan & Norton's four perspectives have been found to be appropriate for most companies and industries
2. Create balanced scorecard team	Assign team for implementation consisting of members with various skills, knowledge and are from different departments.
3. Gain executives and seniors managers' commitment	Acquire management commitment and responsibility for implementation. Management must be involved at every step in the implementation and show their commitment.

Table a3-1: Implementation roadmap dominant factors

The main factors per category in order of importance are:

Planning	
4. Communicate balanced scorecard	The balanced scorecard has to be communicated throughout the whole organization from top to low level. Implementing a new system or project such as the balanced scorecard may bring a significant change in the way employees view their job, therefore it is important to ensure that everyone is involved at every level of the organization.
5. Initial plan	Before implementation, sources of performance data should be identified.
6. Stimulate culture	Culture is a crucial element to be prepared before implementing any new system in an organization. All organizational levels have to be prepared prior to introducing the balanced scorecard, starting at the top and permeating throughout the whole organization. Organizations need to create a culture where all employees can participate and be involved in the balanced scorecard implementation.
Development	
7. Mission, values, vision, strategy	A clear mission, values, vision and strategy should be in place before identifying the balanced scorecard. The balanced scorecard concerns the implementation of already planned strategies.
8. Training	The balanced scorecard is essentially a new approach for organization. It is about adopting new perspectives and processes, and about innovation and change. Consequently, employees' training and education initiatives help facilitate this change by providing employees with the knowledge and skills they require to adapt to and lead to this change process.
9. Set objectives and measures	All objectives in the balanced scorecard have to be derived from the organization's strategy.
10. KPI's	Key performance indicators should be defined by the balanced scorecard. They measure performance-linked corporate goals by tracking performance across the balanced scorecard perspectives. By demonstrating the cause-and-effect relationships between key performance indicators, the balanced scorecard provides managers with an obvious understanding of how their decisions impact not only their area of responsibility, but also other departments and the overall organization strategy.
11. Cause-and-effect linkage	Establish relationships and linkages between KPI's, which is supported by the balanced scorecard definition of cause-and-effect relationships in the strategy map.

Implementation	
12. Rolling out implementation plan	Develop an implementation plan for the implementation of the balanced scorecard through the organization top-down. Assign responsibilities per department for implementation.
13. Cascading the balanced scorecard	The balanced scorecard objectives and measures have to be cascaded from top to the bottom of the organization. The organization starts its balanced scorecard by identifying the strategic objectives in the upper level of the organization and then cascading to the lower departments to determine their achievements and contributions to overall goals. This cascading is translated in the balanced scorecard within the definition of the strategy map.
14. Information system design	An information system that presents and communicates the balanced scorecard through the organization should be developed.
Sustainability	
15. Automating the balanced scorecard	Automation is crucial for balanced scorecard implementation success. Automation enables a quicker culture change, provides visibility to the balanced scorecard process and facilitates participation by a wider audience. Therefore, organizations should automate their balanced scorecard and choose the most appropriate software.
16. Updating balanced scorecard measures and linking them with rewards	Kaplan and Norton believe that the rewards of executives and managers have to be tied with the results of the balanced scorecard measures (Kaplan & Norton 1996). The balanced scorecard team has to expect a number of changes in the measures of each perspective. Even the organizational strategy may require to be changed, due to sudden changes in internal or external circumstances. Therefore, performance measures have to be updated according to new circumstances. Despite changes of circumstances, the measures should be evaluated and reviewed at least once a year in conjunction with the organization planning.
17. Corporate alignment	The balanced scorecard measures should work in congruence with organization's strategic objectives. Strategic initiatives should be aligned with strategic objectives identified in the balanced scorecard.
18. Benchmarking[41]	Benchmarking is considered as one of the critical success factors of balanced scorecard implementation. A company can compare its own performance on a particular strategy, identified by the balanced scorecard measures, with that of others. The balanced scorecard can use benchmarking information to set targets.
Benefits realization	
19. Regular reporting	One potential benefit of balanced scorecard implementation is a clear system for regular reporting. The balanced scorecard can also enable organizations to integrate all aspects of the management information system and it can have a consequence on how managers think about their business and how they invest their time and resources.
20. Measurements assessment	The strategic performance measures must be assesses according the balanced scorecard.
21. Problem solving and action planning	The balanced scorecard can help to solve various problems and provide the organization with action planning. Balanced scorecard measures can enhance problem-solving and team-communication processes in numerous ways, including development of common understanding of the problem, signifying that a solution has been found and testing potential solutions. The balanced scorecard enables an organization to focus on its efforts on those critical processes.

[41] Benchmarking is an ongoing process of measuring and improving products, services and practices against the best that can be identified worldwide (McGaughey 2002).

Learning and innovation	
22. Learning and innovation	A performance appraisal system encourages learning and innovation. The existing of a learning environment encourages people to innovate and share best practices and knowledge.

Table a3-2: Implementation roadmap main factors

The supporting factors in order of importance are:

23. Integration	The balanced scorecard should be integrated in the strategic management system.
24. Self-assessment[42]	Combining the balanced scorecard and self assessment models (such as the European Foundation for Quality Management model) may increase the ability of an organization.
25. Finalize measures	The balanced scorecard team has to narrow the set of identified strategic performance measures and choose those that help the organization to execute its strategy. In general, an organization has to be aware of the number of measures chosen. The key to determine the organizations balanced scorecard measures is assuring an adequate description of the organizations strategy through its balanced scorecard perspectives.
26. Fine tuning and refining	The balanced scorecard has to be communicated to every level of the organization and should compare current performance with past results.
27. Finalize balanced scorecard plan	The balanced scorecard measures must have a direct link to strategy, by identifying the measures according the strategy map. The organization has to specify precise meanings of its strategic performance measures.

Table a3-3: Implementation roadmap supporting factors

[42] Self-assessment refers to a comprehensive, systematic and regular review of an organization's activities and results referenced against the EFQM Excellence Model. The Self-Assessment process allows the organization to discern clearly its strengths and areas in which improvements can be made and culminates in planned improvement actions which are then monitored for progress (Wikipedia self assessment 2007.

Appendix 4: Viral marketing messages

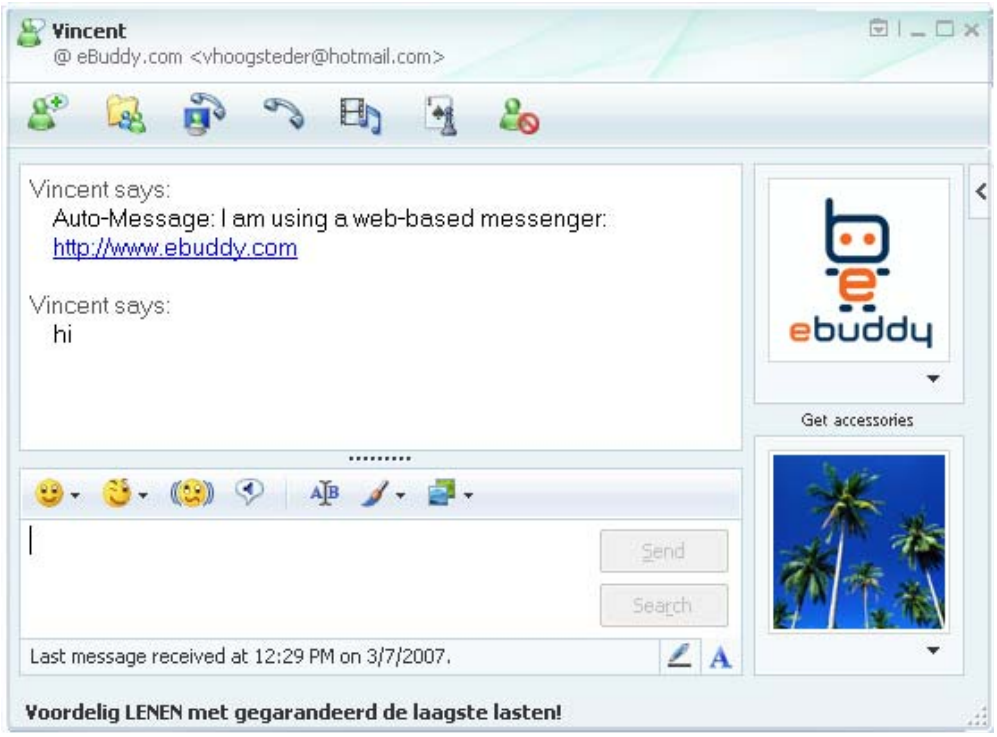


Figure a4-1: eBuddy viral marketing message on chat conversations

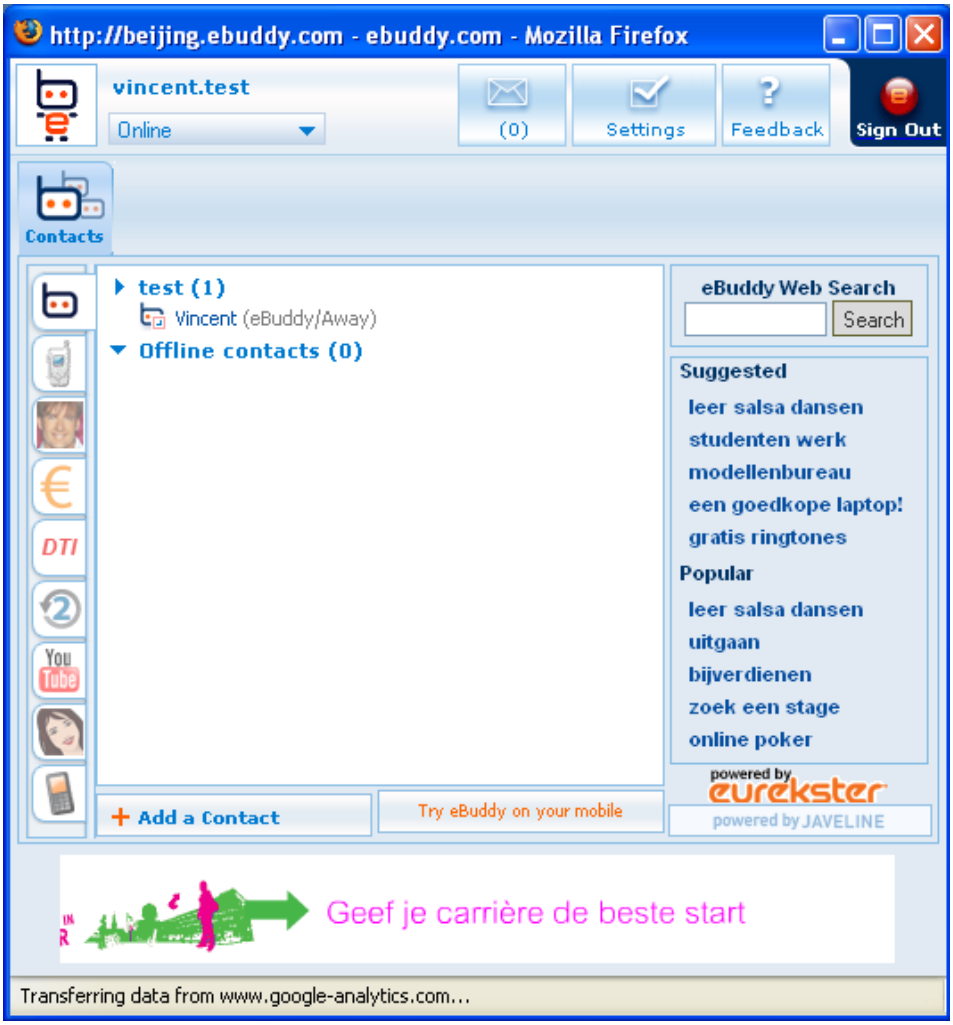


Figure a4-2: eBuddy viral marketing message on contact list status message

Appendix 5: eBuddy data warehouse

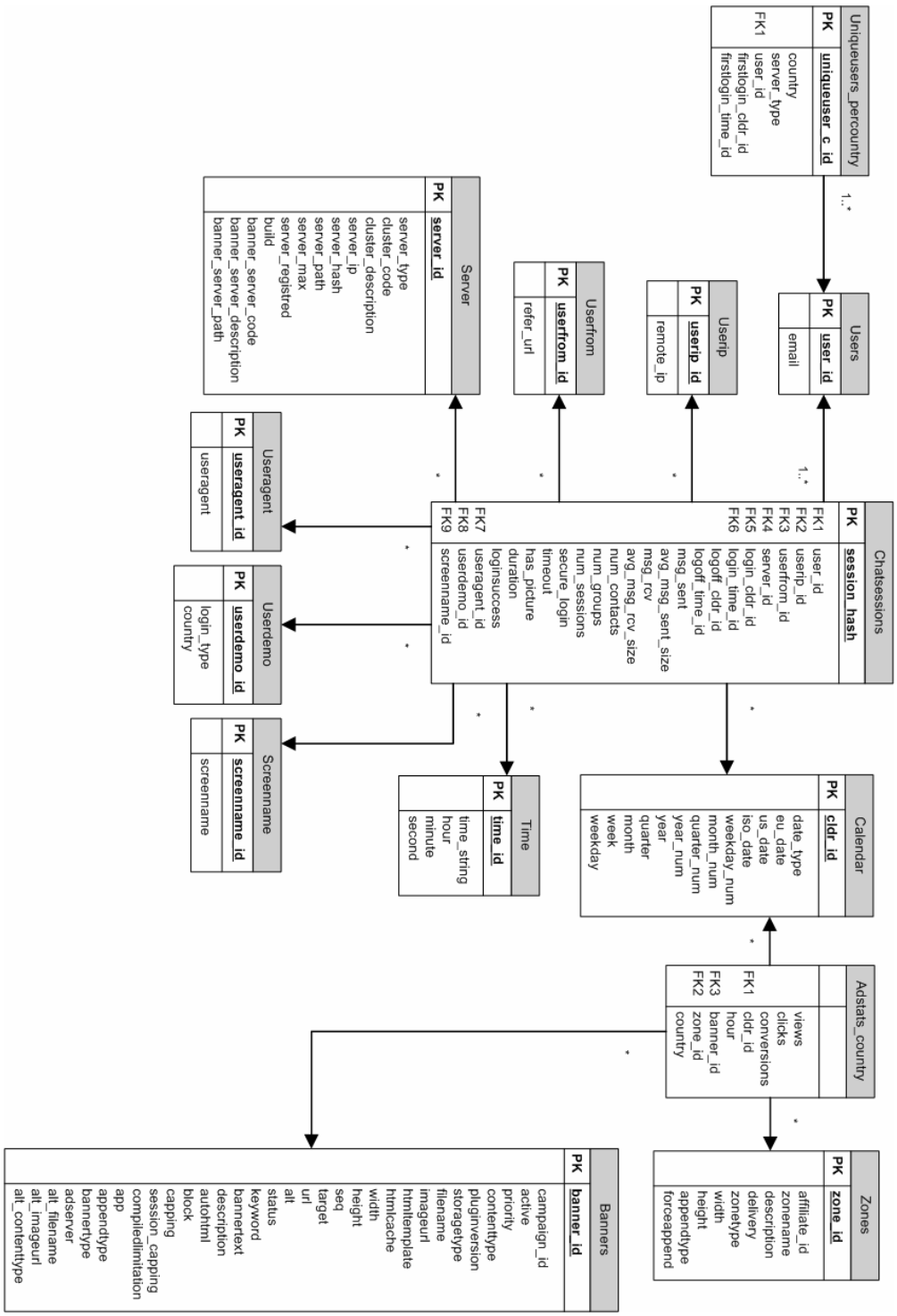


Figure a5: Entity relationship diagram of eBuddy's data warehouse[43]

[43] The abbreviation PK in this Figure stands for primary key, which uniquely identifies each instance of an entity type. FK stands for foreign key, which refers to a primary key of a related entity type. The relative cardinality '*' stands for any number equal or greater than zero.

Entity type	Attribute	Description
Users	user_id	unique identification of a product user
	email	email address of user
Chatsessions	session_hash	unique identification of a product usage
	user_id	refers to a unique instance of Users
	userip_id	refers to a unique instance of Userip
	userfrom_id	refers to a unique instance of Userfrom
	login_cldr_id	the date of the chat session, refers to a unique instance of Calendar
	login_time_id	the time of the chat session, refers to a unique instance of Time
	logoff_cldr_id	the date of the end of the product usage, refers to a unique instance of Calendar
	logoff_time_id	the time of the end of the product usage, refers to a unique instance of Time
	msg_sent	the number of chat messages sent
	avg_msg_sent_size	the average number of characters in the chat messages sent
	msg_rcv	the number of chat messages received
	avg_msg_rcv_size	the average number of characters in the chat messages received
	num_contacts	the number of contacts in the contact list
	num_groups	the number of groups in the contact list
	num_sessions	the number of chat conversations conducted
	secure_login	boolean that indicates if the chat session was conducted over the secure product version
	timeout	boolean that indicates if there was a timeout in the product usage, which means the session was ended by eBuddy
	has_picture	boolean that indicates if a personal picture was used in the product usage
	duration	the duration of the product usage in seconds
	loginsuccess	boolean that indicates if the product usage was successfully started
	useragent_id	refers to a unique instance of Useragent
	userdemo_id	refers to a unique instance of Userdemo
	screenname_id	refers to a unique instance of Screenname
Uniqueusers_percountry	uniqueuser_c_id	unique identification of a product user in a specific country
	country	country code
	server_type	one of eBuddy's specific products
	user_id	refers to a unique instance of Users
	firstlogin_cldr_id	the date of the first product usage, refers to a unique instance of Calendar
	firstlogin_time_id	the time of the first product usage, refers to a unique instance of Time
Userip	userip_id	unique identification of an ip address
	remote_ip	the ip address of a computer, mobile phone, mobile gaming device or television
Userfrom	userfrom_id	unique identification of an website
	refer_url	the url of a website which refers product users to the eBuddy website
Server	server_id	unique identification of an eBuddy production server
	server_type	one of eBuddy's specific products

Useragent	useragent_id	unique identification of a user agent
	useragent	the useragent of a computer, mobile phone, mobile gaming device or television. Typically includes information such as the operating system and language.
Userdemo	userdemo_id	unique identification of specific product – country combination
	login_type	one of eBuddy's specific products
	country	a country code
Screenname	screenname_id	unique identification of a screen name
	screenname	a screen name of a product user during a chat session. A screen name is a pseudonyms used for chatting.
Time	time_id	unique identification of time
	time_string	a time, accurate by second
	hour	a hour of the day
	minute	a minute of an hour
	second	a second of a minute
Calendar	calendar_id	unique identification of a date
	eu_date	a date in D/M/Y format
	us_date	a date in M/D/Y format
	iso_date	a date in Y/M/D format
	weekday_num	a numbered day of the week
	week_num	a week number
	month_num	a month number
	quarter_num	a quarter number
	year_num	a year number
Adstats_country	views	a number of advertisements published
	clicks	a number of clicks on advertisements
	cldr_id	refers to a unique instance of Calendar
	hour	a hour of the day
	banner id	refers to a unique instance of Banners
	zone_id	refers to a unique instance of Zones
	country	a country code
Banners	banner_id	unique identification of a banner
	campign_id	an advertisement campaign
Zones	zone_id	unique identification of a zone
	zonename	a name of a specific location of advertisement publishing within eBuddy's products

Table a5: Description of attributes in the ERD of eBuddy's data warehouse[44]

[44] Excluded from this description are attributes that are purely aimed at internal product variables.

Appendix 6: eBuddy blog references

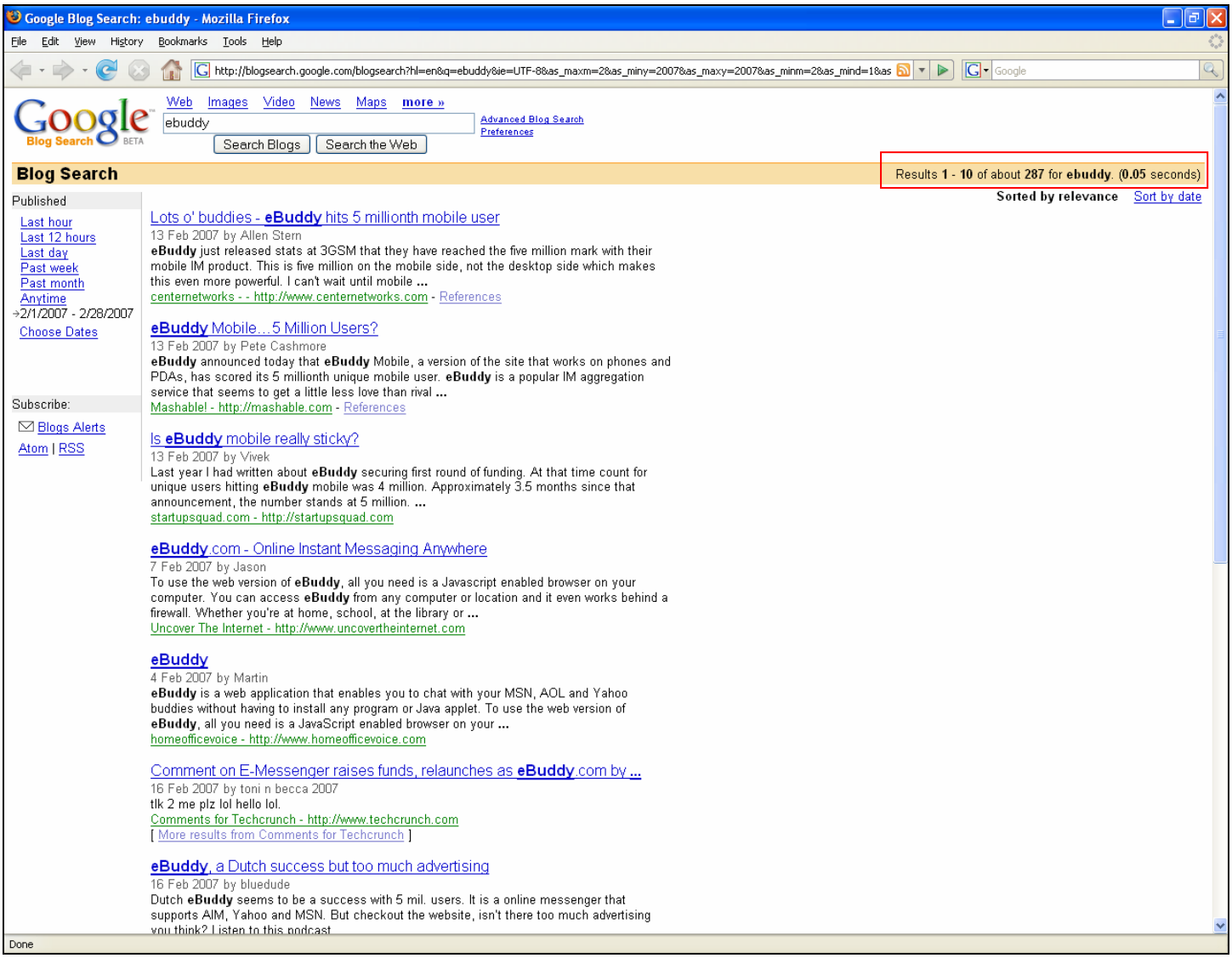


Figure a6: eBuddy blog references in one month according Google Blog Search, http://blogsearch.google.com

Appendix 7: eBuddy user interface flow chart

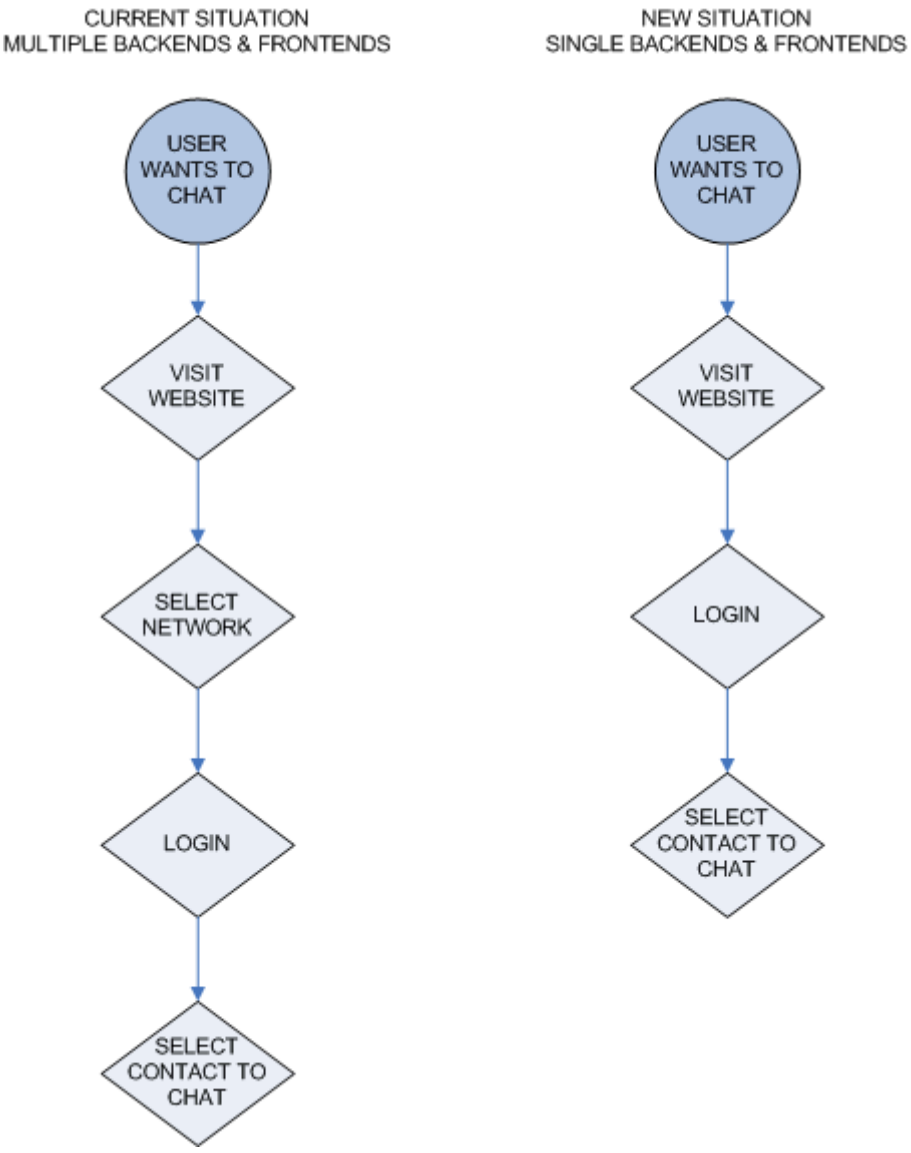


Figure a7: eBuddy user interface flow chart

Appendix 8: eBuddy competitive Wiki

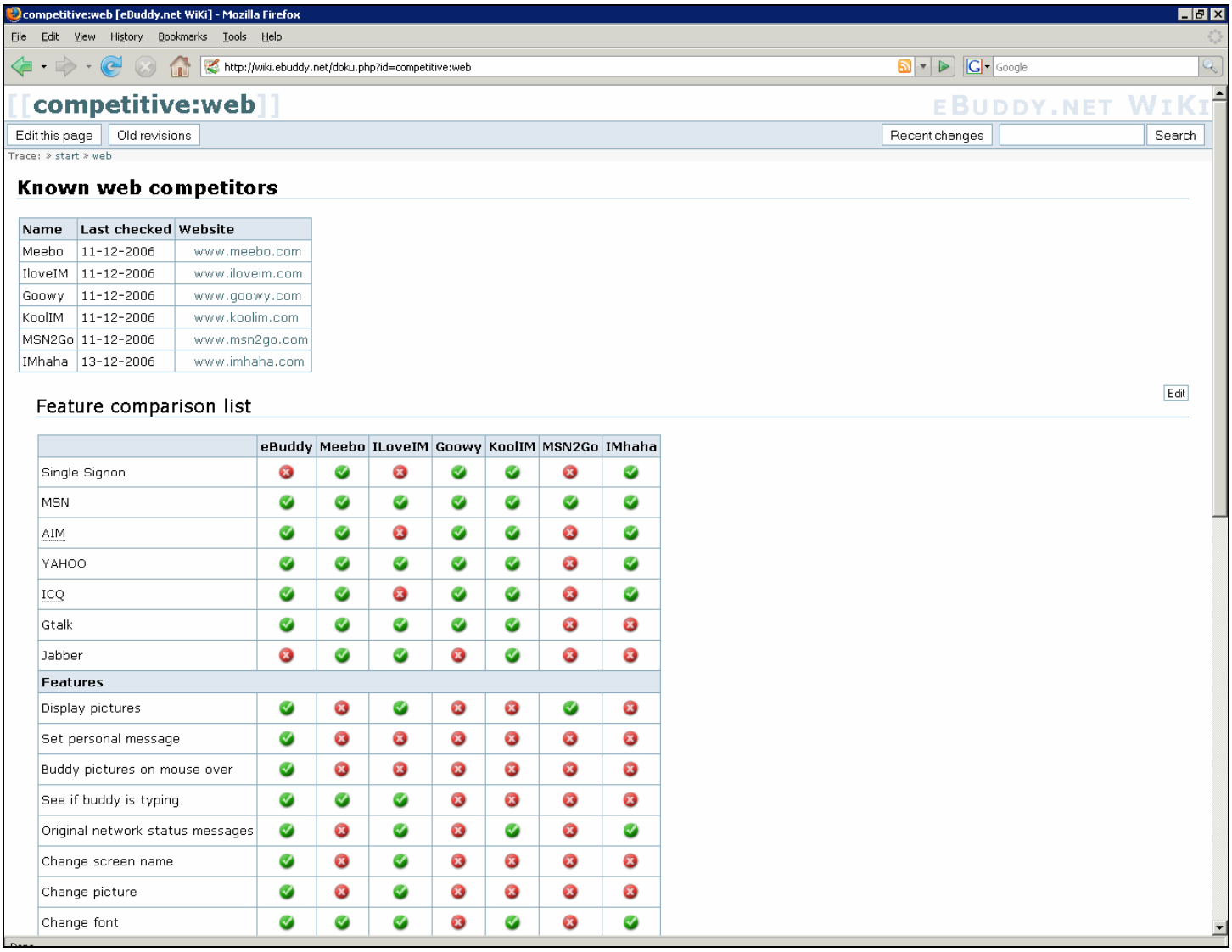
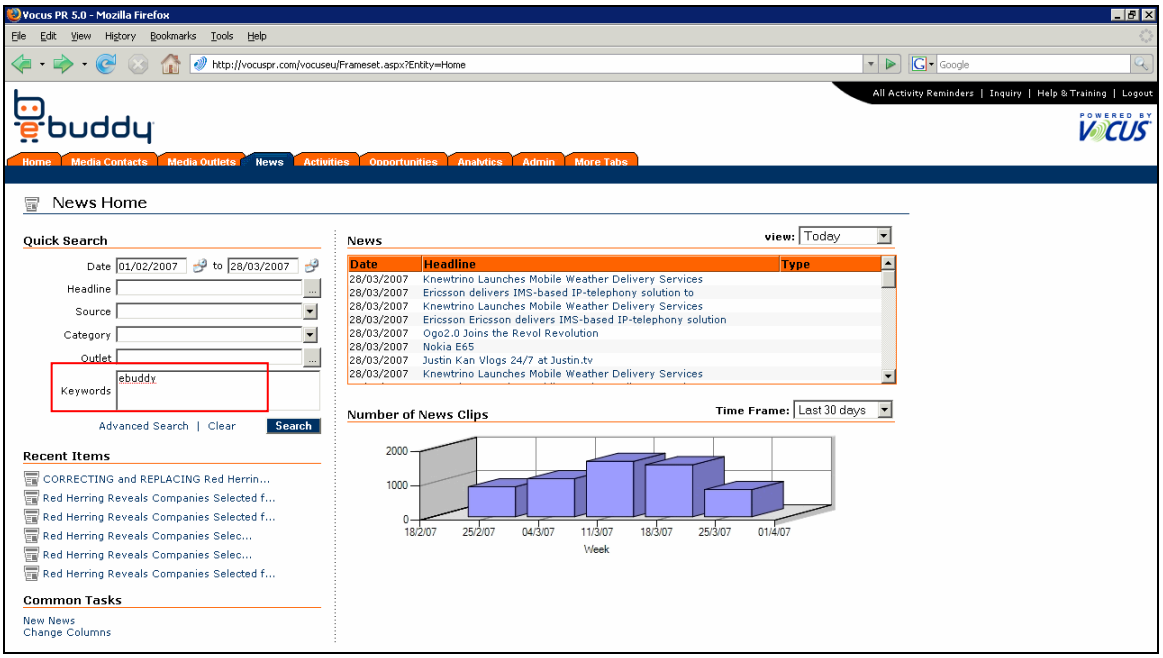


Figure a8: eBuddy competitive internal Wiki website

Appendix 9: eBuddy media coverage



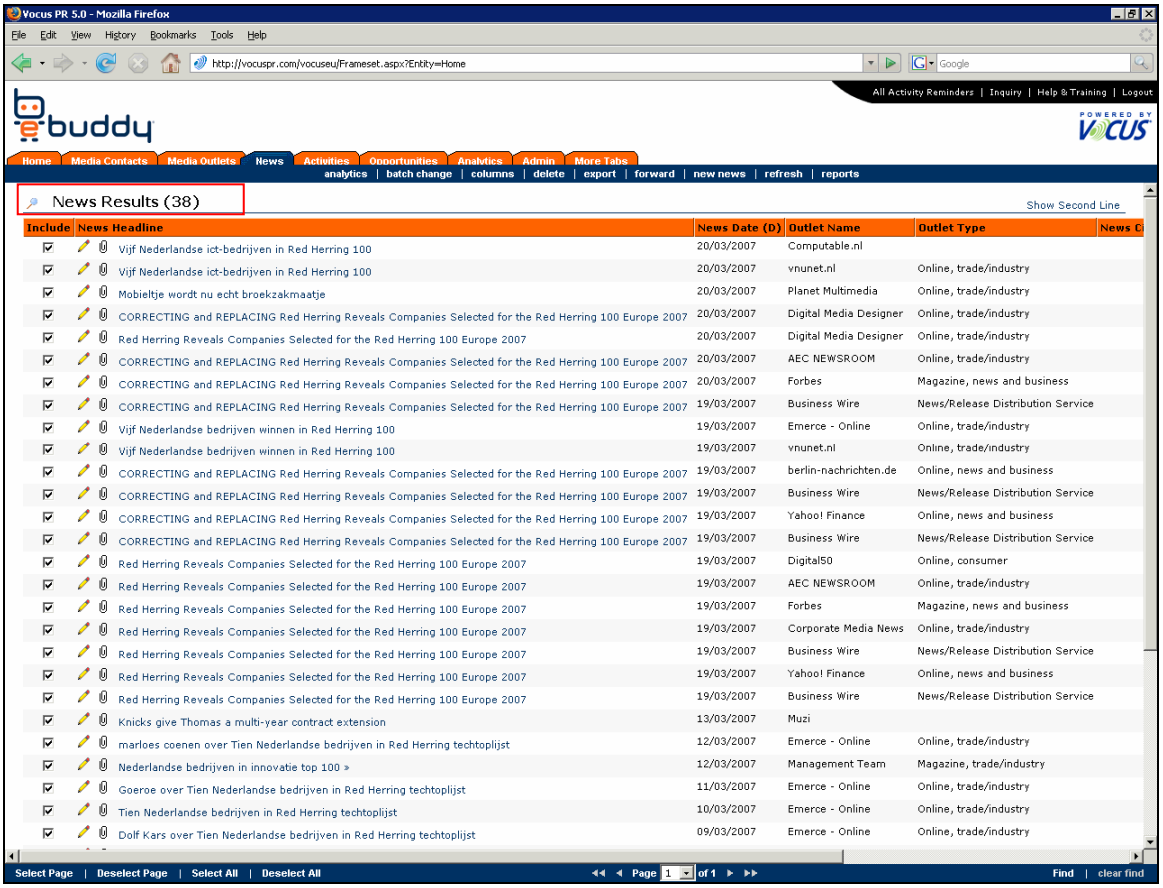


Figure a9: The Vocus information system providing an overview of worldwide media coverage on eBuddy

Appendix 10: eBuddy blog

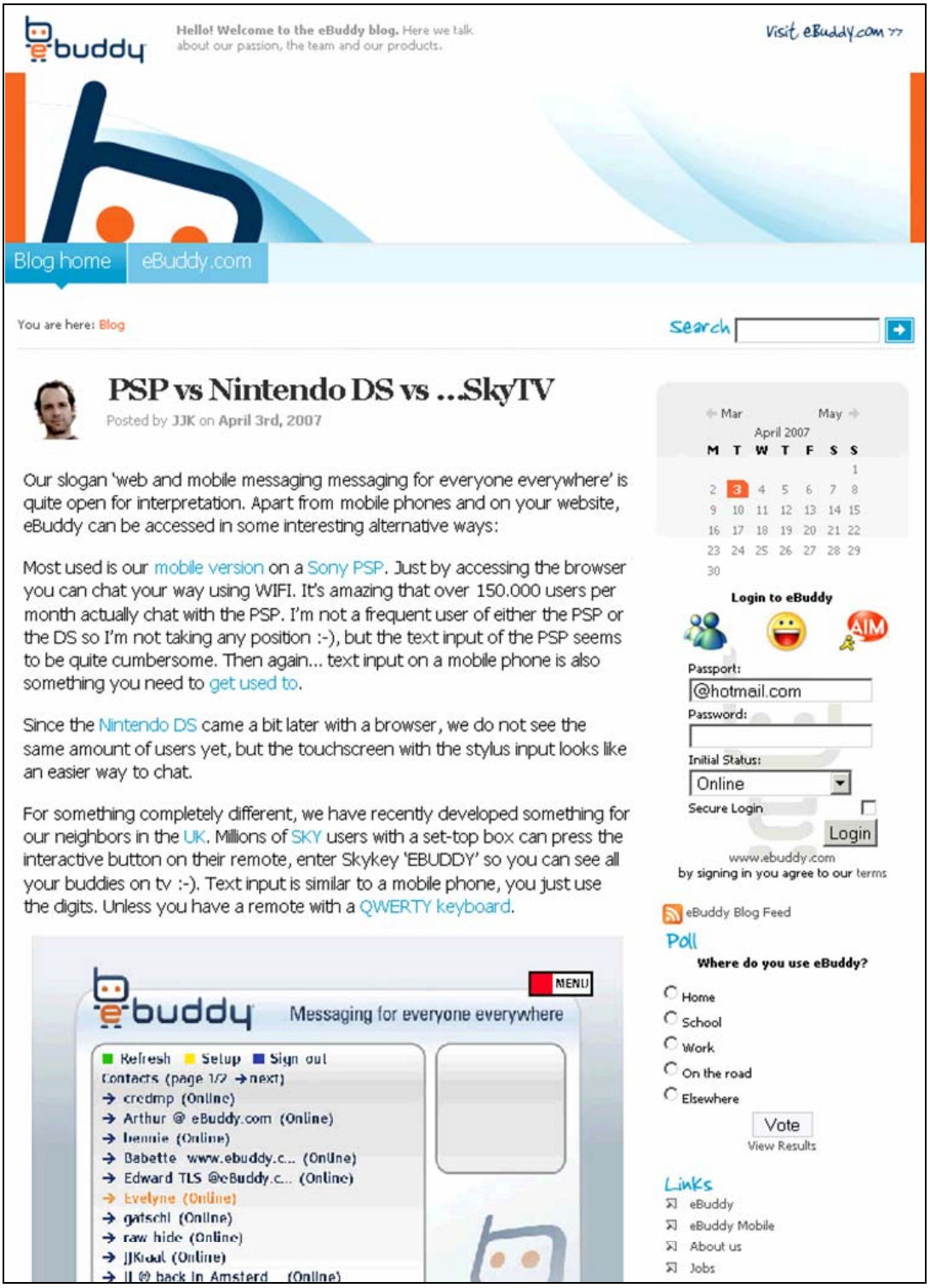


Figure a10: The eBuddy blog with posts and comments from product users, http://blog.ebuddy.com