Tilburg University

Financial behaviour on the internet

van Meer, G.J.L.

Citation for published version (APA):
van Meer, G. J. L. (2006). *Financial behaviour on the internet*. Haveka.

Financial Behaviour on the Internet
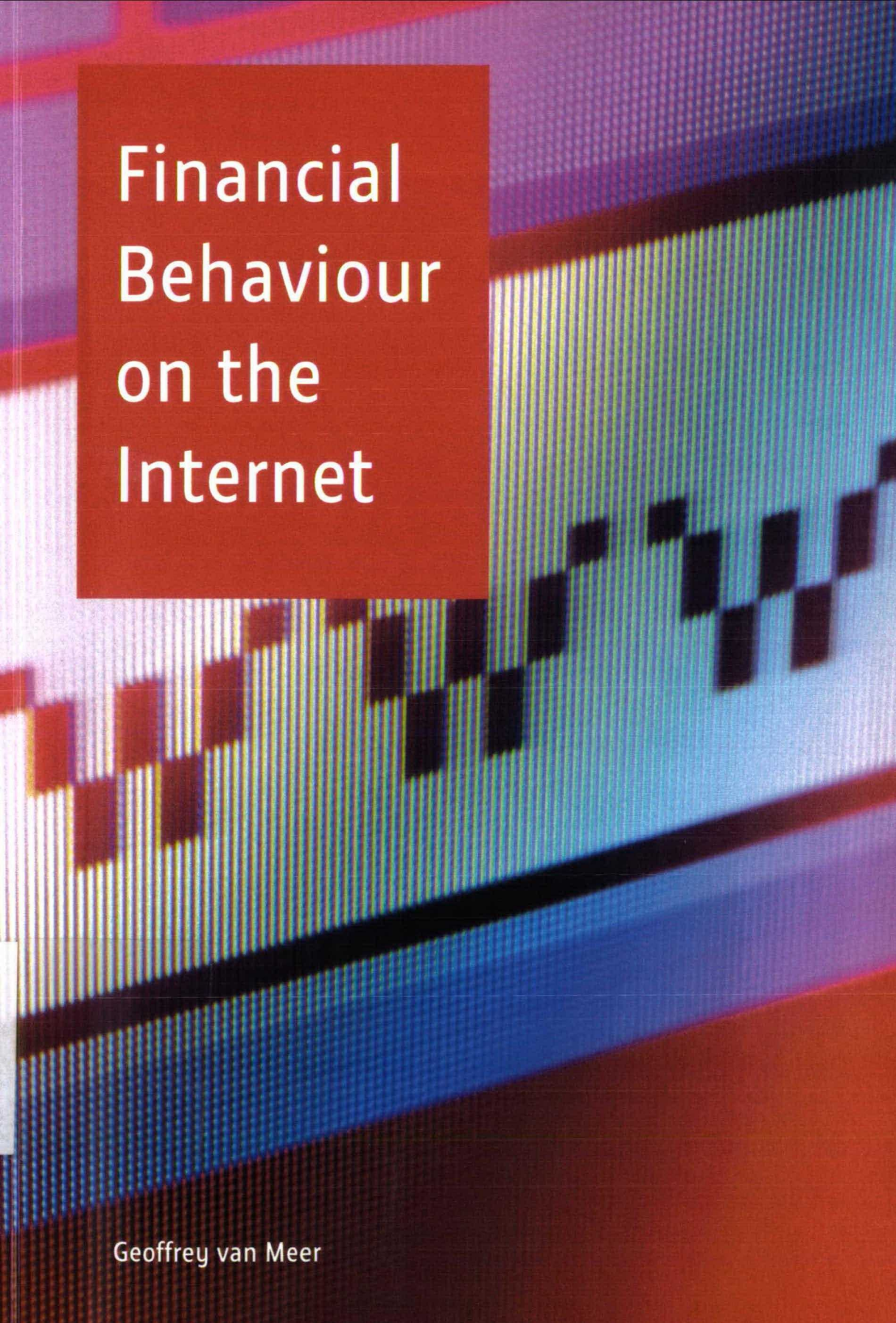
Geoffrey van Meer

FINANCIAL BEHAVIOUR ON THE INTERNET

Financial Behaviour on the Internet

PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Universiteit van Tilburg,
op gezag van de rector magnificus, prof. dr. F. A. van der Duyn Schouten,
in het openbaar te verdedigen ten overstaan van
een door het college voor promoties aangewezen commissie
in de aula van de Universiteit op vrijdag 27 oktober 2006 om 16:15 uur

door

Geoffrey John Louisa van Meer
geboren op 24 oktober 1974 te Roosendaal

Promotor: Prof. dr. W. F. van Raaij

Table of contents

Chapter 4

Clickstream analyses of customer behaviour on a web-banking site

Chapter 5

Clickstream analyses of customer development and retention on a web-banking site

Chapter 6

Market research on customer satisfaction, loyalty and profitability on a web-banking site

Chapter 7

Prologue

Dutch banks have successfully pushed customers to self-service channels for simple transactions: 94% of Dutch consumers use ATMs each month and 44% use online banking. But with only 17% of customers visiting a branch each month - the lowest rate in Europe - Dutch banks are losing touch with their customers. Dutch banks should take advantage of the Netherlands' 55% broadband penetration to deploy techniques that help to create a personal touch with online customers and thus boost product sales (Forrester Research, 2005).

Technological developments are changing our world rapidly. Newspapers are reporting about the growing popularity of new technologies but also about the risks regarding privacy. Although consumer expectations have increased significantly, not all are pleased with the latest technological developments. The start of the 21st century has been accompanied by more concern about the growing impact of technology on consumer experiences. One of the noteworthy changes in the past century has been the growing impact of technology (Van Raaij & Poiesz, 2003; Davis & Meyer, 1998). Also, the financial services sector is dealing with technological developments. With the arrival of the Internet and the introduction of Internet banking for efficiency reasons, customers are more and more dependent on self-serving channels. It is interesting to study the influence of these technological innovations on consumer behaviour, and the way in which Internet banking should be integrated in the marketing strategy of a retail bank.

Another change in today's society manifests itself in an increased trend towards individualism. Individualization is becoming the social structure of the modern society (Beck & Beck-Gernsheim, 2002). Beck observes (1997) "to adapt Jean-Paul Sartre phrase: people are condemned to individualization... whatever a man or woman was and is, whatever he or she thinks or does, constitutes the individuality of that particular person". However, the past years the growing individualization of society is not in a hedonistic context, but in a communicative one. New networks and communication technologies enable people to build relations with other individuals. Information and services appropriate to each individual can be instantaneously selected, sorted, and discretely delivered to each individual. The individualization of information and services is important, because it satisfies a latent human need better than the generic mass medium can. In line with the increased individualization of today's society consumers demand a more personal approach. In addition, there is a growing

1

need to have products and services adapted to their own characteristics and preferences (Van Raaij & Poiesz, 2003). Firms are facing a trend towards customer individualization. Explanations may be found in the growing number of single households, an orientation towards design and, most importantly, a new awareness of quality and functionality which demands durable and reliable products corresponding exactly to the specific needs of the purchaser (Zuboff & Maxmin 2003; Prahalad & Ramaswamy, 2004). In particular, consumers with large purchasing power are increasingly attempting to express their personality by means of an individual product choice. As a consequence of the employment of new interactive media, companies are better able to offer their products and services to the personalised needs of the customer. Also, the financial services sector is dealing with the increased trend towards individualism. After years of closing down branch offices due to costs saving, there is a reverse trend of opening branch offices again. The need for individualized services forces banks and other financial institutions to re-establish the personal contact. Therefore it is necessary to have precise understanding of financial behaviour at an individual level, and subsequently to deliver the proper treatment.

In response to customer individualization the authorities have introduced new legislation about new conducts of order to protect the privacy of the customer. Companies must follow standards of qualities, like reliability and professionalism, regarding their customers. It is probably a lasting struggle between the increasing individualization on one hand and a more tightened legislation on the other hand.

Marketing scholars and practitioners have shown increasing attention to describing concepts as new technologies and consumer behaviour to increase business efficiency. They are actively engaged in studying and exploring the foundations of these concepts and are developing various new sub-disciplines, such as services marketing, advertising, e-commerce and so forth. However, to the best of our knowledge, not so many scholars have intensively studied the combination of online financial behaviour and customer relationships on the Internet.

In this dissertation, I try to generate practical and useful insights into the impact of Internet banking on customer relationships in the financial services sector, and in particular into the behavioural aspects of customers towards online behaviour. Several real-world applications are provided.

Chapter 1   Introduction and problem specification

Abstract

In recent years, the growth of the Internet has had a significant impact on the way consumers behave and interact with financial services providers. Internet banking has changed financial behaviour of consumers, and the relationship between banks and customers as well. The detailed records of web usage behaviour provide researchers and practitioners with the opportunity to understand online behaviour. However, financial services providers are still dealing with the challenge how to analyse online banking behaviour. And despite the many opportunities, they experience difficulties to undertake proper marketing actions to create and maintain relationships with customers through the Internet.

In this chapter, the background and the domain of this dissertation are described. The research problem and the accompanying research issues are briefly introduced. At the end of this chapter the outline of this dissertation is provided.

1.1   Background to the dissertation

In recent years, the growth of the Internet has had a significant impact on the way consumers interact with financial services providers. This is evidenced by the growing popularity of the Internet and Internet banking, and more recently the increase in websites offering financial advice, as well as the growth in online purchasing of financial products. The Internet has changed financial behaviour of consumers, and also the relationship between banks and customers. Before describing the impact of Internet banking on customer relationships in the financial services sector in sections 1.2 and 1.3, there is a short introduction of studies describing consumer behaviour.

1.1.1   Consumer behaviour

An important reason for studying consumer behaviour is the significant role it plays in our daily lives. Much of our time is spent on buying activities, and a large amount of additional time is spent thinking about products and services, talking to others and seeing or hearing advertisements about these. Consumer behaviour is about how people make decisions, how they buy, what they buy, and why they buy. It studies characteristics of individual consumers

such as demographics, psychographics, and behavioural variables in an attempt to understand people's needs.

The history of consumer behaviour is as old as the hills although historically it was not called consumer behaviour. Adam was the first consumer when he ate the apple offered to him by Eve (Antonides & Van Raaij, 1998). Consumer behaviour is important from a number of different points of views. From the perspective of science, the study of consumer behaviour is a rich domain in which to test economic, cognitive, economic-psychological and social-psychological theories (Antonides & Van Raaij, 1998). Consumer economics is the science that develops knowledge and understanding of the economic behaviour of consumers and places this knowledge at the consumer's service for making purchases decisions more effective (Maynes, 1976). Behavioural economists apply scientific research on human and social cognitive and emotional biases to better understand economic decisions and how they affect market prices, returns and the allocation of resources. In sociology, social behaviour is specifically directed at other people. The acceptability of behaviour is evaluated relative to social norms and regulated by various means of social control.

Psychology differs from sociology, anthropology, economics, and political science, in part, by studying the behaviour of individuals, individual or in groups, rather than the behaviour of the groups or aggregates themselves. The actual psychology behind consumer behaviour is based on several factors: ego involvement, loyalty, commitment, family decision-making, influence of friends and relatives and novelty seeking (Crotts & Van Raaij, 1994). All of these factors have been studied by psychologists to better understand the forces behind these behaviours. In general, consumer behaviour contains different factors (Kotler, 2003):

♦   cultural factors (culture, subculture, social class etc.)

♦   social factors (membership and reference groups, family, role and status, lifestyle etc.)

♦   personal factors (personality, interests, education, income etc.)

♦   psychological factors (motivation, perception, learning, belief and attitude etc.)

There is also a difference between consumer attitudes or traits and consumer behavioural outcomes. Attitudes or traits can be defined as the distinguishing features of an individual's state of mind or disposition, whilst behaviour is the observable action or response an individual makes to any given situation. It can be argued that (along with many other factors) an individual's attitudes or attitudinal traits drive their subsequent behaviour. In reverse, it can also be argued that an individual's attitude is created as a consequence of the self-perception of his or her own behaviour. It is clear that consumer behaviour is driven by as well as a

consequence of the combined forces of the other dimensions, such as personal triggers, socio-demographic background and external environment.

An integrated approach is needed to explain buyer behaviour focussing on how behavioural and psychological concepts can be used to develop and evaluate marketing strategies (Antonides & Van Raaij, 1999). This dissertation describes consumer behaviour and the psychological factors, attitudinal aspects in specific, in relation to the Internet.

From the perspective of marketing, the study of consumer behaviour is important in helping to forecast and to understand consumer demand for products as well as brand preferences (Antonides & Van Raaij, 1998). An understanding of buyer behaviour principles is important for the marketing manager to make effective decisions that take into consideration how buyers are likely to respond to the actions of the firm. It is becoming increasingly recognised that, in order for firms to successfully develop the products and services that will fulfil the needs and wants of the individuals in the marketplace, a sound knowledge of buyer behaviour is necessary. Buyer behaviour research provides ideas for market segmentation and for marketing activities. Consumer behaviour is a sphere of interest of marketing that blends elements from psychology, marketing, and economics. It gives ideas about how marketing strategy should be formulated and implemented (Van Raaij et al., 1988).

When do we refer to consumers and when to customers? The difference between a consumer and a customer is that a customer is defined in terms of a specific firm while a consumer is not (Loudon & Della Bitta, 1993). The term "customer" is typically used to refer to someone regularly purchases from a particular store of company. A consumer is an individual who uses the products, goods, or services of some organization. The difference between consumer and customer is further explained with regard to type of relationship in section 2.2.

Consumer behaviour and/or customer behaviour is changing as a consequence of technological developments resulting in an increasing consumption through the Internet. There is a growing number of e-companies, for example 'Amazon.com' which sells consumer products such as CDs, DVDs, videos etcetera, only through the web. In figure 1.1.1 the growth of e-commerce in the Netherlands (population older than 13 years) from 2001 to 2005 is shown.

Figure 1.1.1   *E-commerce in the Netherlands (population older than 13 years)*
              from 2001 to 2005 (source: TNS NIPO)
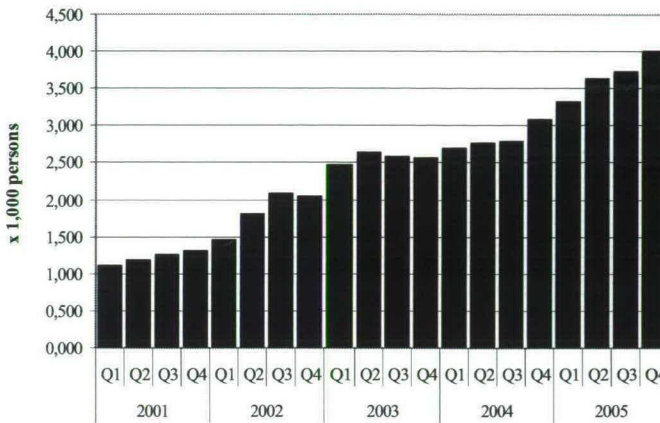
Over the past five years the consumption through the Internet increased. With the development of new interactive media, consumers have acquired even more power. With the Internet, consumers can take the initiative to communicate, retrieve the information they want and where they want it, and then, if they choose, order various products and services (Antonides & Van Raaij, 1998). They are able to orientate themselves much quicker and more efficiently onto the offerings, as well as the alternatives as well as the characteristics of the products and services (Van Raaij, 2000). The Internet is for consumers an "open bazaar", because they are choosing the sellers to satisfy their needs (Comer et al., 1999). Markets become more transparent to them. There is a large number of independent websites comparing similar product offerings from different suppliers, like 'CheapTickets.nl' or 'HotelComparison.com'. Customers are able to orientate and choose the best offer for them. Not only business-to-consumers (BtoC) websites but also websites functioning as marketplaces for trading (buy or sell) goods by a diverse community of individuals (CtoC) are popular, like the world largest online marketplace 'eBay.com'. At the same time, in a competitive environment, like the Internet, firms have to attract and retain prospects appropriately. Online capabilities could be extremely helpful in acquiring and retaining customers. Despite the abundant opportunities, they do not know how to undertake proper marketing actions to create and maintain relationships with customers through the Internet.

1.2   Internet banking and direct marketing

When in history was the 'marketing concept' prioritised in the business strategy of a company? In the fifties of the last century companies started to centralise customers' needs in

its sales strategy (Hoekstra, 1994). The customer's needs and wishes were treated at an aggregated level, the so-called target group. This implied the introduction of the marketing concept. Subsequently, the concept of the marketing mix and the Four Ps of marketing - product, price, place and promotion - entered the marketing textbooks (McCarthy, 1960). The most widely accepted definition of marketing comes from the Chartered Institute of Marketing (CIM) in the UK. The definition claims marketing to be the "management process of anticipating, identifying and satisfying customer requirements profitably". This definition implies that marketing is focussed on responding to specific needs of customers and at the same time realizing a certain level of profitability (Kuijlen, 1993). The attention towards customer's needs and wishes was summarized in the definition of marketing by Philip Kotler (2003) as: "Marketing is the social process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others". Put in other terms, this means that the customer's needs and wants always have to be put first.

The concept of 'customer relationship' was introduced in the 1960s. Subsequently, the aspect of a long-term relationship started to become important in marketing. Another important development is that companies found cheap and efficient ways to communicate with their customers and prospects. Companies were able to interact directly, not only by mail, but also by telephone - and later on through the Internet. With the use of alternative channels, companies started to find efficient ways to select and contact the target group. That facilitated the 'direct-marketing concept':

Direct marketing is a form of marketing with a specific application of marketing techniques and instruments, which is orientated on creating and maintaining structural and direct relations between suppliers and buyers (Hoekstra, 1994).

This definition implies that direct marketing is focussed on establishing and maintaining a relationship by using direct contact with the customer, without the mediation of an intermediary or an agent. The difference between Marketing and Direct Marketing is more or less the technique of interaction. Direct marketing uses only direct channels, like mail, telephone and/or Internet, to contact their customers. As a bank has more than one product to offer to their customers, it has also more than one channel to communicate with them. Customers and banks are able to interact with each other through different channels. Figure 1.2.1 shows the combinations of type of customers (who are less well off and who are better off), type of product (simple and complex) and type of channel and/or interaction

7

(middleman, telephone, mail or Internet). Affluent customers are offered a personal advisor by the bank; the less affluent customers are requested to communicate with their bank through direct channels like the telephone or the Internet. Complex financial products are, for example, mortgages and life insurances; simple financial products are, for example, savings and travel insurances.

Figure 1.2.1   Combinations of type of customer, type of product
and type of channel and/or interaction
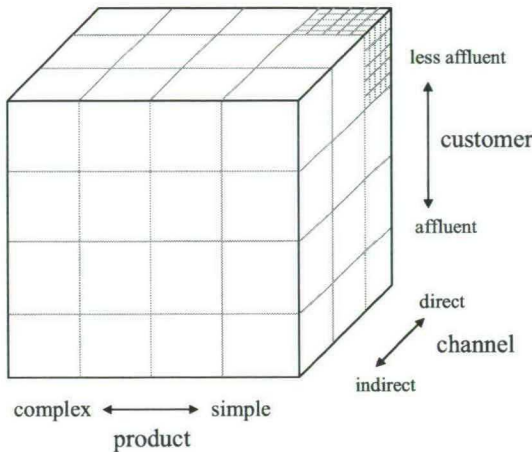
Figure 1.2.1 shows that if a customer needs a specific financial product (complex or simple), he or she is able to choose a suitable communication channel (indirect or direct). They want to decide which communication channels they want to use in order to interact with a service provider (Körner & Zimmerman, 2000). Banks should align their marketing strategies with the customer financial needs, and offer an array of attractive products through different channels. For example, if a customer would like to buy a complex product, a life insurance, the best way to buy it is to ask an intermediary specific financial advice. If a customer would like to buy a simple product, a two-week traveller insurance, the best way to buy it is by telephone or through the Internet (see shaded box in figure 1.2.1). Figure 1.2.1 also shows that the Internet and Internet banking is a suitable self-serving channel for those who want to do simple transactions or who want to buy relatively simple financial products in which no personal advice is needed. This dissertation only describes financial behaviour on the Internet.

Internet banking

There are several company objectives. The most important goal of a company is significant revenue and profit growth. Other important goals are for example continuity, increasing market share, shareholder value, and customer satisfaction. The ultimate goal of a company is customer satisfaction and well-being (Antonides & Van Raaij, 1998). More about the relationship between customer satisfaction and customer profit in chapter 6. The concept of Internet banking entails banks using the Internet as another channel for services and transactions. Internet banking, also called online banking or web-banking, implicates access to an online application from a browser to find information about financial products, and to perform transactions such as bill payment or fund transfer. According to Plasmeijer, Hoekstra and Van Raaij (1999) the Internet has its influence on consumer financial behaviour for the following reasons:

- In the financial services sector adoption and implementation of new technologies, such as the Internet, are common. Financial service products are non-tangible and digitally stored, resulting in a relatively low entrance barrier for the financial services sector to distribute their products at low costs through the Internet.

- Most consumers have already bought financial service products, resulting in a high penetration of financial services among consumers. The high penetration rate of financial services results in a high potential penetration rate of distribution of financial services through the Internet.

With the advent of the Internet, and the tremendous growth in communications technology, retail banks have found it attractive to offer online banking services (Prasad & Harker, 2000). There is also a growing number of direct banks with a strong online presence, like 'INGDirect.com', 'CharlesSwab.com', or 'Egg.com'. In figure 1.2.2 the penetration of Internet banking in the Dutch households from 2000 to 2005 is shown. In 2005 there were about seven million households in the Netherlands.

Figure 1.2.2   Penetration of Internet banking in the Dutch households (source: TNS NIPO)
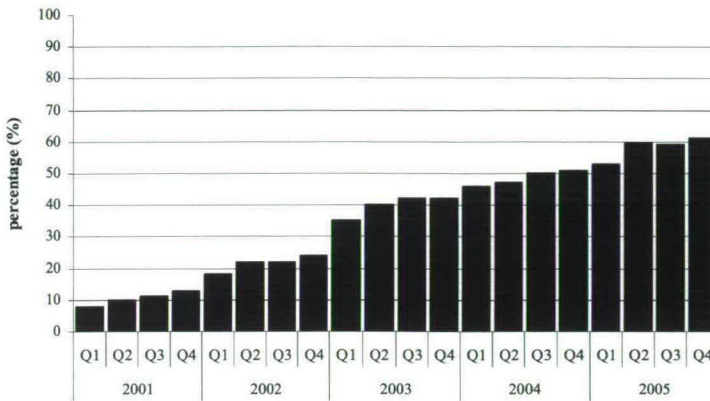
Over the past five years the number of households using Internet banking has increased enormously.

Financial services providers, in general, have established an Internet presence with various objectives. Electronic banking will soon mature into an offensive business strategy rather than a passive 'must have' (Hirst, 1999). While the increased convenience of Internet banking has driven customers' demand, banks find it profitable to offer online banking services for other seasons as well. First, there is a significant saving on transaction costs: online transactions costs are a fraction of branch transactions. Further, the use of online bill payment options by customers decreases check processing and telephone call processing costs. A bank also sees great opportunity with a website, because the bank has one single consolidated delivery channel, which if properly used can provide many advantages in terms of marketing. The web allows the financial services sector to offer all its products to the customer, increasing the possibilities of cross-selling. Diniz (1998) describes other motives why financial institutions are using the web to reach opportunities for their marketing strategy:

+   market information,
+   deliver banking products and services, and
+   improve customer relationship.

Seitz and Stickel (1998) reported that the financial services sector is facing two important challenges using the Internet as a 'strategic weapon':

+   there may be contacts from each place of earth at any time of the day or night, and
+   complex products may be offered in an equivalent quality with lower costs to more potential customers.

On the contrary, as a result of Internet banking, customers' cash management has increased: an Internet savings account with a higher interest rate probably convinces customers to better cash management. Through the use of Internet banking customers easily transfer money from one account to another. Banks start to realize that this development is threatening their revenues. The explanation is that money on a payment account delivers high revenue, whereas for money on a savings account they must pay customers an interest rate. Additionally, legislators require different capital provisioning for savings accounts making them even less profitable. A better understanding of customer online banking behaviour might help to undertake proper marketing actions to keep the savings at the bank instead of going to competitors. Despite the many opportunities, banks and financial institutions are inexperienced in creating and maintaining structural relationships with their customers through the Internet. Their marketing strategies are not based on a well-considered theoretic framework. Banks still hardly see the business benefit of increased sales opportunities and customer retention, and lower costs, however, until the Internet becomes a more widely accepted consumer transaction medium and banks align their Internet spending with structured business strategies (Gartner, 1999).

1.3   Domains of the dissertation

There are basically two domains of research that are relevant for this dissertation. These are 'customer relationships' and 'online financial behaviour'.

1.3.1   Customer relationships

Relationships are important in every kind of human endeavour. It has always been a very human activity based on a series of interrelationships among people who play the roles of buyers and sellers. Consumers and customers have different rights and receive different information from a supplier. A consumer is an individual with whom the company has at least some relationship or communication. Essentially, a consumer is an individual about whom you have some information but with whom you do not yet have an established ongoing account relationship. A customer is a step beyond a consumer. A customer is a person who actually has a continuing relationship with a company. Van Raaij and Poiesz (2003) identify four different phases that point to different stages in the development of customer relationships varying from stage 1, as there is no relationship between the product/service provider and the customer, to stage 4 in which the company strives for a relationship that covers a life-time. The marketing concept has always been synonymous with having a

customer relationship. Marketing started to embrace the concept of 'customer relationship' in the 1960s. Since then there are many definitions of relationship marketing, most of them stressing the development and maintenance of long term relationships with customers and sometimes with other stakeholders (Christopher et al. 1991; Morgan & Hunt 1994; Grönroos 1997, 2000). There are at least three aspects unique to relationship marketing:

♦ It is a one-to-one relationship between the marketer and the customer. In other words, relationship cannot be at an aggregate level; it has to be at an individual-entity level.

♦ It is a value-added activity through mutual interdependence and collaboration between suppliers and customers. This is very obvious in the services sector where the customer must cooperate and collaborate whether it is a doctor, accountant, lawyer or a teacher. With Internet commerce, it is also becoming prevalent for traditional product offerings (Sheth & Parvatiya, 2002).

Relationship marketing is an interactive process and not a transaction exchange. This is a fundamental distinction, because marketing is founded on the principle of exchange and transactions (see also about the development of the concept of marketing in section 1.3). Relationship marketing, however, is all about *interaction* and *activities*. Gummesson (2002) suggested that relationship marketing is the core of marketing practices. It is as "an integrated effort to identify, maintain, and build up a network with individual consumers and to continuously strengthen the network for the mutual benefit of both sides, through interactive, individualized and value-added contacts over a long period of time (Shani & Chalasani, 1992)". Today many companies present themselves as customer oriented. The role of the customer relationship is also specified in the 'customer equity model' (Rust et al., 2000). 'Relationship equity' is, besides 'brand equity' and 'value equity', an important factor of the customer equity model. It reflects a group of variables which influences the relationship between the company and the customer, for example loyalty programs and community building programs (Verhoef, 2004).

To meet everyone's wishes companies must strive to optimise their services. Quality of service has been studied in the area of business management for many years because the market is more competitive and marketing management has transferred its focus from internal performance such as production to external interests such as satisfaction and customers' perception of service quality (Grönroos, 1992). Customers actively and increasingly formulate their individual wishes and demands for a service level in a way that is comfortable for them. They want to decide which communication channels they want to use in order to interact with a service provider (Körner & Zimmerman, 2000). Technological innovations might help to

improve the quality of the customer relationship. With each new advance in technology more of the relationship is being managed electronically. The Internet is a useful marketing instrument that enables a dialogue between suppliers and customers which is required for developing and maintaining satisfying buyer-seller relationships (Plasmeijer, 1999). The Internet functions as a catalyst for mutual communication and brings buyers and sellers closer to each other.

Also the financial services sector must challenge the possibilities of new technology in order to optimise their communication. The web allows them to offer products low-priced to the customer and the interactive format could help to create and improve customer relationships. A customer relationship can be established by direct contact, such as opening a deposit account or filing an application for a loan, which the bank approved. One benefit of a customer relationship is the information about the individual held within the bank and the ongoing relationship status. The profitability of the customer relationship is depending on the level of customer information. The Internet provides the opportunity to learn more about customer and to intensify their relationship.

The financial services sector faces an uphill struggle to integrate the Internet in their marketing strategy. Despite the many opportunities, banks and other financial institutions are still inexperienced in undertaking proper marketing actions to create and maintain relationships with customers through the Internet. Some e-marketers are lacking customer focus. Is this management conservatism or do they lack a conceptual framework to understand online banking behaviour? An appropriate framework might be helpful to financial services providers to improve their customer relationships.

1.3.2 Online financial behaviour

On the one hand money is necessary to satisfy some basic needs as drinks, food, shelter and medical treatment. This is the instrumental value of money. On the other hand money has an intrinsic emotional side, for example money is perceived as freedom, safety, power, luxury and so on. This is the symbolic value of money. Everybody finds out what is the personal value of money throughout their lives. These values start to develop from childhood. Not everybody is born in a family where budgeting and saving is a normal financial behaviour. In some families debts are inevitable and are a natural habitual behaviour. Children must develop financial values and capabilities until they have reached adulthood and become financially independent.

In modern times, individuals are being required to make more and more financial decisions, many of which were previously taken for us, for example health insurances or pensions. But against this increasing requirement for financial capability, the capability of those who need to make financial decisions is too often inadequate with respect to specific financial knowledge. A large part of customer behaviour is explained by non-rational behaviour. It is important for marketers and policymakers to understand how customers cope with the alternatives in the marketplace which might affect their financial behaviour. The implication is especially severe in financial services, such as for a customer who is required to plan his/her own savings. Consumer behaviour is influenced by emotional and psychological biases, for example fear, greed, risk seeking, aversion and peer group pressures. It is interesting to study the effect of very large choice sets as well as methods for structuring financial information on consumer behaviour.

The role of technological innovations towards financial behaviour might be worthwhile. The arrival of the Internet and the introduction of Internet banking, with its expected influence on consumer behaviour, is also relevant to the financial services sector. In the next section the role of the Internet in the financial services sector is described.

1.4   Problem definition and research questions

The rationale as described in the previous section makes clear that financial services providers have difficulties with analysing and understanding online behaviour in order to develop strong relationships with their customers. As a result, on a tactical level marketers and policy makers are dealing with the business issue: "How to integrate Internet banking in the direct-marketing strategy"? From the author's perspective there are three main reasons why banks and other financial services providers have difficulties using the Internet in the direct-marketing strategy. The most important reasons are:

a) In 2005 about 12% of all Dutch households bought a financial product through the Internet (TNS/NIPO, 2005). Most banks and other financial services providers utilise the Internet as a self-service channel and a delivery channel for simple transactions or products. However, banking relationships are tenuous – consumers feel satisfied with their primary bank, but they do not necessarily plan to grow the relationship beyond a current account (Forrester, 2006a). Financial services providers do not benefit the Internet as a marketing instrument to interact with their customers in order to build customer relationships.

b) Nearly half of Europe's Internet users bank online. The other half have tried online banking and given up or never banked online. Banks are losing online banking users due to

a mix of poor service design, security fears and satisfaction with existing channels (Forrester, 2006b). In order to improve their services most banks are trying to acquire an integral picture of customer behaviour at an individual level. However, they often do not have access to data about customer behaviour on the Internet.

c) Most banks and other financial services providers use Online Analytical Processing (OLAP) for reporting on the number of page requests and on the number of visitors' sessions of a website (= site traffic). However, they lack understanding of customer online banking behaviour at an individual level.

In order to find a solution, the above issues are translated into research problem. The research problem addressed in this dissertation is as follows:

How to analyse online banking behaviour in order to understand customer relationships through the Internet?

The research problem is specified into five questions, which are described as follows:

Q1.   In a hyper-competitive environment, like the Internet, financial services providers have to service customers and prospects appropriately. In accordance with their direct-marketing strategy, banks should create and maintain relationships with their customers to be able to deliver the requested services. In direct marketing there are two important aspects, these are creating and maintaining a direct and structural relationship between buyers and sellers. The first aspect refers to identifying potential customers and developing relationships with them. The second aspect is maintaining a relationship, which refers to 'customer retention'. Financial institutions are failing to undertake proper marketing actions through the Internet to create and maintain relationships with their customers. The reason is that there is a lack of a conceptual framework to understand the dynamics of online banking behaviour. With the insight into customer online banking behaviour, banks will know how to guide new customers and how to intervene in undesired routine behaviour or pending inactivity. From this perspective the first question is formulated:

Question 1:   What is an appropriate conceptual framework to understand longitudinal online banking behaviour?

In chapter 2 the concept of customer life cycle, as an appropriate conceptual framework is introduced. The customer life cycle starts with reaching potential customers and progresses

towards established loyal customers. Several examples of marketing interactions to create and maintain relationships between banks and their (loyal) customers through the Internet are provided.

Q2.   Every year the financial services sector invests a lot of money in market research. The outcomes of market research contribute to the development and the optimisation of products and services of banks. Market research asks customers what they think, need or wish. Unfortunately, there is a gap between what people say and what they actually do.

Since the inception of the Internet, the ability to track the behaviour of their visitors has been considered one of the most promising facets of the new medium. The detailed records of web usage behaviour provide researchers and practitioners with the opportunity to study how users browse or navigate websites and to assess the performance of these sites in a variety of ways (Bucklin & Sismeiro, 2002). A web server logs each and every mouse-click. The data reflect visitors' behaviour on the site at a microscopic level. Although expensive market research projects are conducted, the free clickstream data of visitor's behaviour on the website are still hardly analyzed. The development of websites is based on ICT-knowledge and outcomes from market research, but is generally lacking clear insight into visitors' online behaviour at an individual level. Analyzing longitudinal customer online behaviour is still a challenge for the financial services sector. The Internet is being perceived as a black box. Banks and other financial institutions need an appropriate research methodology to be able to analyse and monitor customer online behaviour at an individual level. Referring to the importance of understanding customer behaviour, it is important to find out what type of research methodology is appropriate for analyzing online behaviour. Therefore the second research question is formulated:

Question 2:   What is an appropriate research methodology to analyse online banking behaviour?

In chapter 3 clickstream analyses as an appropriate research methodology for analyzing online banking behaviour is introduced. Several benefits of clickstream analyses are described in chapter 3.

Q3.   In order to have a clear insight into customer online behaviour at an individual level it is necessary to analyse clickstream data. It might be interesting to find out what applications

of clickstream analyses are possible in the financial services sector. In addition, what types of research techniques can be used for analyzing clickstream data in order to have a better understanding of customer behaviour on a web-banking site? Therefore the following question is formulated:

Question 3:   How to analyse customer behaviour on a web-banking site?

Based on the selected research methodology in chapter 3, clickstream analyses, chapter 4 shows several examples of statistical techniques how to analyse customer online behaviour. It proves that clickstream analysis can be used as a tool for optimising the website as well as directing customers through the website. Chapter 4 reports on a real-world application of analyzing clickstream data from a financial institution in The Netherlands.

Q4.   Customers are using Internet banking and other self-service channels to do simple transactions. To get closer to the customer companies are trying to create a one-to-one relationship with their customers (Peppers et al., 1999), considering their personal needs. If banks want to satisfy customers' needs and create a one-to-one relationship, they must align their product and service offerings with the customer life cycle. The customer life cycle shows that customers' financial behaviour change over time and that these changes are clues to the future. The basic idea is to analyse customers' value to obtain the insight necessary to plan profitable interactions. The conceptual framework of the customer life cycle is in our perspective valid for identifying different types of customers' behaviour over time on a website. Some visitors like the website and might become loyal customers; others do not like the website and might run-away. It is important to monitor and evaluate online behaviour at an individual level. Clickstream analysis is an appropriate research methodology to differentiate usage behaviour on a web-banking site throughout the customer life cycle. Financial services providers need to know how to identify customer development and retention on a web-banking site in order to direct potential loyal and profitable customers. Therefore the following research question is formulated:

Question 4:   How to analyse customer development and retention on a web-banking site?

Based on the conceptual framework in chapter 2 and the selected research methodology in chapter 3, different types of online banking behaviour over time are analyzed in chapter 5. Chapter 5 reports on a real-world application of customer development and retention on a

web-banking site with the use of clickstream data from a financial institution in The Netherlands.

Q5.   In the financial services sector it is well known that the duration of a customer relationship with the bank has a positive effect on customer profitability. Establishment of stable relationships is becoming a key target of marketing efforts. Unfortunately, not all customers with a long-lasting relationship are profitable. Normally, customers are highly loyal with their financial services providers. However, this is probably not true on the Internet, where the opportunities for customer loss may occur at any second. Therefore the following question is formulated:

Question 5:   Is there a relationship between customer satisfaction, loyalty and profitability on a web-banking site?

Chapter 6 reports a real-world application of customer loyalty to a web-banking site of a financial institution in The Netherlands.

What is the contribution of this study to the field of Economic and Social Psychology? Economic and Social Psychology is interested in the economic thinking and behaviour of consumers. This might causes an area of tension, for example, two visitors show the same clicking pattern on a web-banking site, but they both might have different intentions - or the other way round. With several examples from practice this study shows that detailed records of web usage behaviour provide researchers with the opportunity to have a precise understanding of consumer preferences (research question 3 and 4). Beside this, following the CLC, this study tries to link customer online behaviour with customer attitude (satisfaction and loyalty) in order to measure the impact of Internet banking on customer profitability (research question 5).

1.5   Limitations of the dissertation

The research problem addressed in this dissertation is only regarding the relationship between financial institutions and private customers. Suggestions in this dissertation might also be applicable for business-to-business relationships, but this is not examined nor described. In addition, clickstream analyses are not only applicable for online financial behaviour, but of course for any other kind of online behaviour as well.

This dissertation is not a process description of several information systems in the back office. There are no IT-solutions provided how to integrate a web-banking application in the daily marketing practice. This dissertation is neither an ultimate remedy for all the marketing problems with Internet banking in the financial services sector. It provides the insight to the financial service sector to have a better understanding of online financial behaviour and customer relationships. This dissertation hopefully initiates discussion of some important concepts that marketers need to be aware of in integrating Internet banking in the direct-marketing strategy.

1.6 Outline

The flow of the dissertation is summarized in the outline in figure 1.6.

Figure 1.6   *Outline of the dissertation*

```
┌─────────────────────────────────────────────┐
│  Chapter 1                                    │
│    Introduction and problem specification     │
└─────────────────────────────────────────────┘
```

Theoretical background

```
┌──────────────────────────┐  ┌──────────────────────────┐
│  Chapter 2               │  │  Chapter 3               │
│    A suitable conceptual │  │    A suitable research   │
│    framework to understand│ │    methodology to analyse│
│    longitudinal online   │  │    online banking        │
│    banking behaviour     │  │    behaviour             │
└──────────────────────────┘  └──────────────────────────┘
```

Research methodology

Confirmatory research I

```
┌─────────────────────────────────────────────┐
│  Chapter 4                                    │
│    Clickstream analyses of customer behaviour on │
│    a web-banking site                         │
└─────────────────────────────────────────────┘
```

Confirmatory research II

```
┌─────────────────────────────────────────────┐
│  Chapter 5                                    │
│    Clickstream analyses of customer development │
│    and retention on a web-banking site        │
└─────────────────────────────────────────────┘
```

Confirmatory research III

```
┌─────────────────────────────────────────────┐
│  Chapter 6                                    │
│    Market research to customer satisfaction, loyalty │
│    and profitability on a web-banking site    │
└─────────────────────────────────────────────┘
```

Synthesis

```
┌─────────────────────────────────────────────┐
│  Chapter 7                                    │
│    Epilogue: conclusions, recommendations for │
│    future research and managerial implications │
└─────────────────────────────────────────────┘
```

After specifying the problem (chapter 1) an appropriate conceptual framework (chapter 2) and an appropriate research methodology (chapter 3) are described. Subsequently, three confirmatory research studies (chapter 4, 5 and 6) with several real-world applications are provided. Finally, conclusions are drawn and recommendations are made (chapter 7).

Chapter 2   An appropriate conceptual framework to understand longitudinal online banking behaviour

Abstract

Despite abundant opportunities, financial services providers still experience difficulties to undertake proper marketing actions to create and maintain relationships with their customers through the Internet. With the insight into customer online behaviour, banks and other financial institutions might know how to guide new customers and how to intervene in undesired routine behaviour or pending inactivity. A conceptual framework to understand online banking behaviour is suggested. Within this framework there are myriad possibilities to direct customer behaviour and to optimise the profit of the website.

2.1   Introduction

The technological innovations are changing our world rapidly. The Internet creates reversed markets in which customers seek vendors, and play them off against one another, rather than as in the traditional approach (Hagel & Armstrong, 1997; Van Raaij, 1998; Godin, 1998). The Internet has changed the retail environment; the balance of power has shifted (Walsh & Godfrey, 2000). For the first time in the history of modern business, it is now cost-effective for companies to establish relationships with each and every customer who wants the company to know him (Seybold, 2001). The financial services sector too is dealing with these developments. The so-called 'customer-empowerment' licenses financial services providers to supply their products and services through a direct channel as the Internet. Nowadays customers are able to arrange their financial household more and more independently and without specialised help. In line with the increased individualization of today's society customers ask for a more personal approach (Molenaar, 1997). With the Internet as interactive media the financial services sector is able to personalise sites, and create opportunities for customisation and provide added value (Walsh & Godfrey, 2000). In a competitive environment like the Internet, financial institutions have to service customers and prospects appropriately. Despite the many opportunities, most banks and other financial institutions are still unable to undertake proper marketing actions to create and maintain relationships through the Internet. A conceptual framework with favourable conditions for banks to integrate Internet banking in their marketing strategy is suggested. Within this framework there are a myriad of possibilities to direct customers' behaviour and to optimise the profit of the website.

In this chapter, a conceptual framework to understand online banking behaviour is suggested. The link between 'direct marketing' and the 'customer life cycle' is described (see § 2.2). In addition, the role of Internet banking (see § 2.3), customer online behaviour (see § 2.4) and customer loyalty (see § 2.5) in the financial services sector is expounded.

2.2   Customer life cycle (CLC)

The life cycle framework is the standard way that economists think about the intertemporal allocation of time, effort and money. The Dictionary of Demography (Wilson, 1985) defines the term 'life cycle' as 'the sequence of stages through which individuals' pass beginning with birth and ending in death'. The idea of non-reversible stages through which progression is made with age is not new. Shakespeare used the idea of the seven ages of a man: infant, schoolboy, lover, soldier, justice, pantaloon and second childhood (Murphy & Staples, 1979). Many different typologies of the life cycles based on different personal characteristics are described. The family-cycle hypothesis was originally formulated by Rowntree (1902). Franco Modigliani won the 1985 Nobel Prize for economics with his contribution to the 'Life Cycle' - an analysis of the behaviour of household savers. Modigliani's model demonstrates how stages in life affect a person's financial decisions. Peoples' financial needs change through their lives. Changes in family life cycle stages give rise to differences in financial service needs (Modigliani & Abel, 1980; Yeagal, 1987; Javalgi & Dion, 1999). Another life cycle is described by Cutler and Sterne (2000), and it understands that a customer's behaviour changes over time. The 'customer life cycle' by Cutler and Sterne describes the progression of phases (reach, acquisition, conversion and retention) a customer goes through when considering, purchasing, using, and maintaining loyalty to a product or service. Of course, along the way, many individual customer life cycles are cut short by attrition (Cutler & Sterne, 2000). Customer attrition implies that customers go out of business, move, build relationships with other companies, switch to a competitor, and or even find the product and or service inadequate for their needs (= a lack of satisfaction). A customer-centric measure related to the phases a customer goes through is the 'customer life-time value (CLV)'. The CLV reflects the desire to leverage customer acquisition investments by building up long-term customer relationships (Peppers & Rogers, 2005; 1999). The CLV is the present value of a customer over the entire history of that customer's relationship with a company (Berger & Nasr, 1998). Referring to the definition of direct marketing (see section 1.3), creating and maintaining a structural and direct relationship is important and necessary from a business point of view. Looking at customer behaviour over time, the dynamics of starting and having

a relationship with a company of institution is reflected in the customer life cycle. This study suggests the customer life cycle, henceforth CLC, as an appropriate conceptual framework to understand customer behaviour on the Internet (see figure 2.2.1). The proposed framework underlines the importance of the progression of phases a customer goes through, and also integrates two important aspects of direct marketing: creating and maintaining customer relationships. Also the importance of customer value over time is integrated in the proposed conceptual framework. In figure 2.2.1 the Y-axe reflects the customer value during the CLC. The basic idea behind CLC is: analyse what is the customers' value throughout their CLC so that a company have the insight necessary to plan profitable interactions. It is applicable to a customer's behaviour at various stages of the relationship with a company. The concept of customer relationship is described in section 1.2. The terms creating and maintaining, extracted from the direct marketing definition (see section 1.3), are inserted into the CLC (see figure 2.2.1).

Figure 2.2.1   The proposed customer life cycle (CLC)
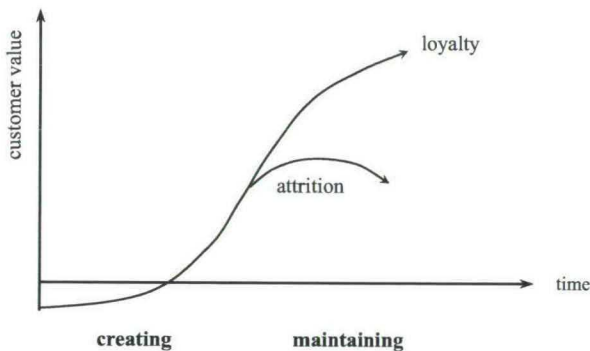
The CLC describes the continuum where a company:
+   Acquires the person as a registered and/or paying customer;
+   Reinforces the customer relationship by cross-selling products and/or services
+   Keeps him or her as a loyal customer; and
+   Turns the customer into an ambassador. This means that the customer recommends the product and/or the company to other customers.

The first two bullets are related to creating and developing a relationship with a customer, whereas the latter two bullets are related to maintaining the relationship (= retention). This study does not describe the aspects of reaching and acquiring potential customers, but focuses

on customer relationships on the Internet, and in particular into the behavioural aspects of customers towards Internet banking.

What is the impact of the Internet on the CLC? The speed or rate of behaviour change is incredibly important to modelling interactive behaviour, much more important than in offline models. Small changes over time are to be expected; rapid and accelerating changes are much more significant and a signal for action (Novo, 2004). It is interesting to study changes in customer online behaviour over time.

In terms of direct marketing there are two stages of customer behaviour on a website throughout the CLC. The first stage is 'customer online development' and the second stage is 'customer online retention'. Customer development is focussed on increasing the number and variety of services (cross-selling) and on increasing the level of customer usage for specific services (deep-selling). The second stage of customer online behaviour throughout the CLC is 'customer retention'. In the off-line world, the prosperity of companies depends on their repeat customers. This is also true on the World Wide Web, where users are just a click away from competing sites (Agrawal et al., 2001). Once a customer has found a particular company or institution on the web, it is important that everything necessary is done to retain that customer. Electronic migration has made customer retention, or more specifically customer erosion, a major concern of financial institutions.

The CLC starts with creating relationships and progresses towards established loyal customers. Customers have specific expectations and wishes in each phase of the life cycle. A starter needs a different approach than an experienced customer (with a high mature level). Behaviour may evolve over time, especially in a changing environment like the Internet (Moe & Fader, 2002). In section 4.2 the CLC is further described to illustrate how to analyse customer online banking behaviour in order to understand customer relationships through the Internet.

Interactivity

A structural and direct relation can only be created and maintained if there is sufficient interaction between a supplier and a buyer. Holder (1998) positioned the aspect of interaction in direct marketing. Holder regards four cornerstones of direct marketing. These are illustrated in figure 2.2.2.

Figure 2.2.2   Cornerstones of direct marketing according to Holder (1998)
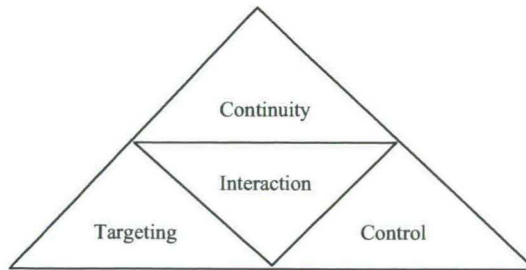
At the top of the pyramid is the concept of continuity. In direct marketing, the goal is to use customer information to develop an ongoing continuous relationship with each individual. Direct marketing activity is also characterized by a unique ability to target customers with relevant communications. With all the information companies have in their database, when used properly, it is possible to target customers with increasingly relevant marketing offers. Database information can thus be used to ensure that customers receive relevant product information at the appropriate point in time. Direct marketing is also characterized by control. It is possible to develop and send a mailing to a small representative sample of the database. The pattern of response can be assessed and the most effective version of the mailing rolled out to the remainder of the customer-database. Not only does this allow an organization to select the most appropriate mailing, it also allows it to predict with a high degree of accuracy the performance of the overall campaign. Finally, at the base of direct marketing is the concept of interaction. Direct channels afford marketers numerous opportunities to engage the customer, with creative opportunities far superior to those that would be available through traditional channels. Technological innovations are conducive to interactivity in our communication between each other, for example the Internet.

What is 'interactivity'? While intuitively appealing, interactivity is a complex and nebulous concept that is not well-understood (Heeter 1989; Steuer 1992; Anderson, 1995; Haeckel, 1998; Ruyter, 2000). Interactivity is more than a simple choice, like click or no-click. Rafaeli (1988) defines interactivity as "an expression of the extent that in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions". The essence of the interactive format is whether it 'dramatically enhances the customer's experience (Spalter, 1995; Ruyter, 2000)'.

De Ruyter (2000) described the following principles of interactivity:

+ Access on demand: users have the possibility to interact everywhere and anytime.

+ Synchronicity: brief response intervals of multiple bi-directional information exchanges.

+ Constructive and control: users can exert control over the form and contents of products and services.

+ Timeliness: real-time and up-to-date response. Interactivity refers to a short feedback interval (Van Raaij, 1998), which recalls the memory of an earlier contact.

+ Self-optimisation: as users interact with the content, a cycle of success can be created wherein content attracts users, users create more content and new content enhances the value.

These are the antecedents of the interactive format of a product and/or service that is electronically offered by suppliers to consumers. However, products and services are not always developed in line with customer needs and wants. At a point of company-customer interaction, customers sometimes want to engage very differently than companies do (Prahalad & Ramaswami, 2004). The way consumers think is associated with for example expectations, privacy, needs and lifestyles, and the way companies think is associated with distribution, sales, procurement, technology platform and so on. Value is not created by the firm unilaterally, value is created only at the point of intersection or interaction of the consumer and the company takes place (Prahalad & Ramaswami, 2004). The interaction might not be a single reaction but a structural and ongoing process between the supplier and an individual.

Kierzkowski et al. (1996) studied the role of interactive marketing in the services section. He put in one model the influence of new developments on type and shape of the product or service and the extent of distribution. He formulated two dimensions: (a) the need of interaction and (b) the potential of a customer. The co-ordinated system has four different quadrants. In figure 2.2.3 the influence of the Internet on type and shape of the product offer, the product concept and the distribution concept is positioned.

Figure 2.2.3   Categories suitable for digital marketing by Kierzkowski et al. (1996)

high	News	Insurance	Financial services
	Software	Music	
Selected groceries		Books	
	Interactive games		
		Real estate brokerage	Travel services
Fit with interactive media			
	Sporting goods	Toys Autos	
		White goods	Medical services
	Convenience stores	High-end apparel	Consumer electronics
	Gasoline	Fine jewelry	Baby products

low   *Potential for relationship*   high

The upper right quadrant - where both potential for relationship and need for interaction are high – contains emotion-based products that require some interaction during the buying process. This is also the domain in which the Internet firstly was accepted (Molenaar, 1999).

Is there a relationship between the level of interactivity of a website and the attitude towards the website? McMillan (2000) conducted a research to develop the construct 'Attitude toward the Website', which is an important measure of Website effectiveness. The study found that perceived interactivity can explain a large portion of the variance in attitude toward the website. Thus, a strong positive reaction to the site as a whole may be motivated, at least in part, by a strong sense that the user is able to interact with the site (McMillan, 2000).

2.3   Customer online banking behaviour

How can Internet banking contribute to a stronger customer relationship? The financial services sector needs to have a better understanding of customer online behaviour. Looking at the CLC (figure 2.2.1) in combination with the definition of direct marketing (see section 1.3), there are two important aspects described, these are *creating* and *maintaining* a structural relationship with customers. These two aspects are described in relation to Internet banking.

2.3.1 Creating relationships

If a company wants to use the Internet as a communication and distribution channel, it is important to build a website that suits customers' needs. Customers must experience the interactive opportunities of Internet banking by offering them the products they need at the right moment. Looking at the fourth cornerstone of direct marketing (Holder, 1998), the essence of the interactive format is whether it 'dramatically enhances the customer's experience' (Spalter, 1995, Ruyter, 2000). Technological innovations are conducive to the interaction between banks and customers. Interactivity might be the key to integrate Internet banking in the direct-marketing strategy. If there is no interaction between a bank and a customer, the customer's value will probably not change. Banks should check if their web-banking application succeeds the criteria of an interactive format as described by De Ruyter (2000): access on demand, synchronicity, constructive and control, timeliness and self-optimisation. Compared with traditional channels banks have to benefit from the interactive features of Internet banking. The interactive format of Internet banking helps to create and grow customer relationships by identifying cross-sell and deep-sell opportunities. Relationship marketing focuses upon the interaction between suppliers and customers. Relationship marketing should also focus upon another type of interaction: the one between customers and products (Paas et al., 2005).

Several interesting offers of financial products can be shown on the web-banking site of the bank. Three examples of how banks should use data on customers' purchasing habits from the marketing database (= offline) for sales opportunities on the web (= online) are provided:

- Based on information in the database that a customer has taken a (new) mortgage, he or she probably wants to insure the house against fire and theft. The next time when the customer visits the website he or she sees a pop-up or a banner by which the bank actively promotes an insurance.
- Based on information in the database the bank knows that a customer suddenly transfers money to a (savings) account outside the bank at the end of the month. The next time the customer visits the website he or she sees a pop-up or a banner by which the bank actively promotes a saving account with an alluring interest.
- Based on information in the database the bank knows that a customer trades stocks by telephone. This customer is allocated in the cost-control segment. The next time the customer visits the website he or she sees a pop-up or a banner by which the bank promotes the varied advantages of trading stocks through Internet banking.

Another type of data is customer behaviour on the website. Walsh & Godfrey (2000) mentioned that the Internet offers a number of advantages to collect and analyse an extensive amount of customer information continuously, in a very short time and at relatively low costs. The paradox of the Internet is that it seems an impersonal, anonymous environment, but in fact it is easier to track customers' preferences in an electronic environment than it is through traditional channels. A web server logs each and every mouse-click. The data reflect visitors' behaviour on the site at a microscopic level. Every bank or financial institution should be aware which customers, when, and how often visit the website and what exactly they do when they are visiting the website. Analyzing customer online behaviour might help marketers to discover customers' needs. Each visit to the website presents a unique opportunity to maximize the customer value. Three examples how banks should use information of customer online behaviour for sales opportunities on the web (= online) are provided:

♦ Based on navigation data the bank knows that a customer visits the pages with information about credit cards. The next time the customer visits the web-banking site he or she sees a pop-up or a banner by which the bank actively promotes the ease and comfort of a credit card.

♦ Based on analyzing customer online behaviour the bank knows what previous pages customers visited before they entered the website of the bank. The bank might be able to place banners on these pages (with a hyperlink) referring to a specific financial product.

♦ Customers that search are worth twice as much as customers that do not search (Kohavi & Parekh, 2003). The bank must record every searched keyword and identify high-spending customers.

It should be possible to identify several online sales opportunities. Several online companies recommend products to consumers through the Internet. Ansari et al. (2000) examined the merits and provided and overview of methods of recommendation systems.

Data about online behaviour is very sensitive to every change in customer behaviour. Chapter 5 shows online development between visitors and registered customers during the first weeks on a web-banking site. It illustrates what type of customers banks must identify and interact with to create a relationship with potentially loyal customers.

2.3.2 *Maintaining relationships*

The problem of most banks is the lack of differentiation in customer development on the web. In what way is it possible to detect a change in customers' behaviour that is correlated with inactivity? If banks strive to enhance customer retention, they must lock customers into a

process that is not easily duplicated, replicated and when performed well, not easily abandoned (Nemzow, 1999). Retention of existing customers has culminated in the reuse of stickiness, a recycled marketing expression, as the mechanism for assessing and boosting customer retention. Nemzow (1999) differentiates affinity, short-term stickiness and long-term stickiness. Affinity is useful for initial direct marketing efforts to drive visitors to a site or select from possible advertising venues, but it does not address the stickiness issue directly on retaining customers (Nemzow, 1999). Stickiness is a way to describe a sustainable barrier to competitive market entry or erosion of the customer base, a strategically e-commerce target with permanent and dominant value. The difference between short-term and long-term stickiness is that the former is created at e-commerce websites through brand equity and useful site functions, and it is easily replicated by competitors. The latter needs to grow even stickier over time, creating a financial hurdle that discourage customers from switching to competitors. It requires too much effort, time and money to cancel a banking or savings account and open a new one somewhere else. A website must be a part of the business processes so that a customer must return to the website (Nemzow, 1999). Long-term stickiness enforces customer retention. This type of customer retention is the key to integrate Internet banking in the direct-marketing strategy. Three examples how Internet banking contributes to maintaining relationships are provided. These examples are based on website features that can be used to increase customer retention described by Wiegran and Koth (1999).

♦ The bank should let the customer herself consciously tailor the web-banking site to her own personal needs and preferences. For example, a customer only wants to see an entry on the homepage to his own block of shares. If the customer takes advantage of this 'personalization' feature, there is a high probability that he will be loyal to that site (Wiegran & Koth, 1999).

♦ The web gives the bank the unique opportunity to make individual customer comments accessible to all customers. For example, if a website displays a 'negative' customer comment about the interest of a saving account that only doubles in case of no withdraws, someone else may choose that type of interest for that very reason. When someone sees a lot of comments from other customers displayed, he feels better knowing that others are also using this website. User-generated content is one of the most powerful tools for increased customer retention (Wiegran & Koth, 1999).

♦ A loyalty program with incentives is a way of influencing and changing a customer's buying behaviour. For example, if a customer deposits his annual bonus on his Internet savings account, he receives one percent interest extra for two months. It can be very helpful for banks to inform the customer of a loyalty program: knowing that he has attained a certain status with a bank and that he may therefore be accorded valuable privileges and exclusive treatments can be a very powerful incentive for a customer to be loyal to a website (Wiegran & Koth, 1999).

Data about online behaviour is very sensitive to every change in customer behaviour. With analyzing online behaviour it should be possible to differentiate between potentially loyal behaviour and customer behaviour that is correlated with inactivity. Chapter 5 shows an application of customer online retention on a web-banking site. It illustrates what type of customers banks must identify and interact to maintain the relationship.

A different, but no less promising, approach to a better understanding of the impact of retention on the customer profitability can be seen in the differentiation of types of loyalty according to psychological state, e.g. the customer's involvement (Bloemer & Poiesz, 1989) or actual behaviour. The final stage of the CLC (figure 2.2.1) is customer loyalty. In the next section the concept of customer loyalty is described. In chapter 6 the relationship between customer behaviour, satisfaction and loyalty on a web-banking site is analyzed and described.

2.3.3 Customer Loyalty

An important factor in determining the likelihood of success and profits in an organization is customer satisfaction. As stated by Oliver (1997), "satisfaction is a judgement that a product or service provides a pleasurable level of consumption-related fulfilment". In less technical terms, customer satisfaction is whether a product or service meets their need or expectations. It is possible to distinguish the following types of customers (Oliver, 1997):

♦ Dissatisfied customer. This type of customers is looking for someone else to provide product or service. Dissatisfied customers are a dangerous group, because they tell others by word of mouth about their dissatisfaction.

♦ Satisfied customer. This type of customers is open to offer the next better opportunity. There has been less research on satisfied customers to determine what it takes for a satisfied customer to change.

♦ Loyal customer. This type of customers returns despite offers by the competition. The first denotation of loyalty is that the customer prefers to do business with a company more

than with other companies. Loyal customers don't leave even for an attractive offer elsewhere.

Loyalty is originally a psychological term, a 'state of mind' of the customer, which is not easy to define and to measure. Loyalty can be measured in terms of actual behaviour, for example repeated purchases, share of wallet or profitability. O'Malley (1998) stresses that loyalty must be viewed as 'biased repeat purchase behaviour' or 'repeat patronage accompanied by a favourable attitude'. Uncles (1994) states there are three main types of loyalty and non-loyalty behaviour:

♦ Switching behaviour, the customer either stays loyal and returns or switches;

♦ Promiscuous behaviour, the customer makes many purchases and either always stays and is loyal or is promiscuous and uses a selection of alternatives; and

♦ Polygamous behaviour, the customer makes many purchases but loyalty is divided between many products. Customers may be loyal more or less to any brand. However, most consumers prefer to 'mix and match' their products based on their needs (Kandampully & Duddy 1999), as most businesses are incapable of fully meeting customer needs (Egan, 2001).

Relationship marketers speak of the "relationship ladder of customer loyalty". It groups types of customers according to their level of loyalty. The ladder's first rung consists of "prospects", that is, people that have not purchased yet but are likely to in the future. This is followed by the successive rungs of customer, client, supporter, advocate, and partner. The relationship marketer's objective is to "help" customers get as high up the ladder as possible. This usually involves providing more personalized service and by providing service quality that exceeds expectations at each step (Buchanan & Gilles, 1990).

Relationship marketing suggests that a customer's level of satisfaction with the service provider substantially affects his or her loyalty to the company. Many studies reinforce this notion that customer satisfaction leads to greater customer loyalty (Anderson & Sullivan, 1993; Bolton & Drew, 1991; Bearden & Teel, 1983), which in turn has a positive impact on profitability (Homburg et al., 2005; Reichheld & Teal, 1996). Building strong customer relationships has been suggested as a means for achieving a competitive advantage (McKenna, 1991; Reichheld, 1993). The fundamental assumption of all loyalty models is that keeping existing customers is less expensive than acquiring new ones. The development of loyalty is the result of well-managed customer retention programs. Customers who are targeted by a retention program demonstrate higher loyalty to a business after a certain period

of time. According to Ravald and Grönroos (1996), relationship marketing is used to 'create customer loyalty so that a stable, mutually profitable and long-term relationship is enhanced'.

However, not every satisfied customer is loyal and profitable. What can make customers loyal, which types of customers are more loyal than others and what can make them disloyal? Loyalty does not always occur from satisfaction and dissatisfaction and does not always result in less retention or loyalty (O'Malley, 1998). Lack of alternatives and other factors may lead to false loyalty (Dick & Basu, 1994). Storbacka et al. (1994) stated that 'customer loyalty is not always based on positive attitude, and long-term relationships do not necessarily require positive commitment from customers. The distinction is important because it challenges the idea that customer satisfaction (the attitude) leads to long-lasting relationships (the behaviour)'. In all circumstances it is important to have a clear understanding of the relationship between customer satisfaction and loyalty.

Customer loyalty seems like a quaint notion in the Internet age, when customers can search out lower prices and defect to competitors with a mouse-click (Reichheld, 2003). To create web loyalty is to assume that every Internet customer is constantly at risk of defection and act accordingly (Griffin, 2002). Reichheld and Schefter (2000) first used the term 'e-loyalty'. Sohn and Lee (2002) noted "e-loyalty indicates customers' behaviour to visit and revisit the specific website and make transactions comfortably". Once a customer has found a particular company or institution on the web, it is important that everything necessary is done to retain that customer (Agrawal et al., 2001). For that matter customer loyalty with a website is another synonym used interchangeably with stickiness or website affinity (Nemzow, 1999).

Are customers also loyal to their web-banking site? Normally, customers are highly loyal with their financial services providers. This is probably not true on the Internet, where the opportunities for customer loss can occur at any second. The fact is, e-commerce has trained customers in how to be less loyal because of easy entry, easy exit, higher expectations and competitive pricing. Dissatisfied customers will tell others about their dissatisfaction, and with the availability of the web some are telling much more. Although banks have introduced Internet banking for several reasons, for example cost-reducing, they also take the risk of losing customers and revenue. The increased competitive environment in the financial services market has led to increased pressure to reinforce customers' loyalty. It is within this rapidly changing environment that customer trust and loyalty is commanding the attention of all banking institutions. To what extent customers are loyal to a web-banking site, but they behave differently? Research by Davis, Bagozzi and Warshaw (1989) used a technology acceptance model (TAM) based upon principles originally articulated by Fishbein and Azjen

(1975), as the theory of reasoned action (TRA). The TAM model proposes that behaviour is determined by intention to perform the behaviour, and the intention is determined by attitude toward the behaviour. The intention and the actual behaviour have been found to be highly correlated. Lederer et al. (2000) presented a clear overview of the relevant research about the TAM. However, some visitors are showing the same clicking pattern, but they might have different intentions. Dishaw and Strong (1999) evaluated the TAM and reported that it provides excellent explanation of intention to use but it is much weaker for actual use of the technology, for example a web-banking site. In chapter 6 the relationship between customer online behaviour and customer attitude (satisfaction and loyalty) towards a web-banking site is described.

2.4   From the CLC to an appropriate conceptual framework

Referring to the first research question (see section 1.4) banks and other financial institutions need a conceptual framework to be able to understand longitudinal online behaviour. There are two valid reasons to suggest the customer life cycle (CLC) is an appropriate conceptual framework:

- In order to create and maintain relationship between customers and financial services providers, customer behaviour might not be perceived as single actions but as a pattern of developing behaviour over time. The interaction between customers and financial services providers might not be a single reaction but a structural and ongoing process. The CLC understands that a customer's financial behaviour changes over time, especially in a changing environment like the Internet. The basic idea is to analyse what customers' value throughout their CLC so that you have the insight necessary to plan profitable interactions (see for real-world applications section 5.2). The proposed framework concerns (actual) behaviour of customers. Non-intentional behaviour is not included in this framework nor it is described in this study.

- Financial services providers need to know how to identify visitors who will develop over time and become established loyal and profitable customers. Customer loyalty is the final stage during the CLC model. Chapter 5 shows some real-world applications of online development of visitors and registered customers during the first weeks on a web-banking site. It illustrates what type of customers banks must identify and interact to create a relationship with potential loyal customers. Chapter 6 reports a real-world application of customer loyalty to a web-banking site.

2.5   Some conclusions

In a competitive environment, like the Internet, financial services providers have to service customers and prospects appropriately. In line with their direct-marketing strategy, banks should be able to deliver the requested services in order to create and maintain relationships with their customers. Four aspects must explore this strategy: continuity, control, target and interaction. Especially, the latter is important for integrating Internet banking in the direct-marketing strategy of a bank. The interactive format of Internet banking helps to create and grow customer relationships by identifying cross-sell and up-sell opportunities. Several marketing (inter-)actions are necessary to create relationships between banks and their customers through the Internet. A web-banking site must be a part of the business processes so that a customer automatically comes back. It needs to grow over time, creating a financial hurdle that discourages customers from switching to competitors (Nemzow, 1999).

The dynamics of customer *online* behaviour is reflected in the customer life cycle (CLC). The CLC describes the progression of phases a customer goes through when considering, purchasing, using, and maintaining loyalty to a product or service. It is a framework which presents customers' online value over time. Banks must analyse and monitor customers' online behaviour value throughout the CLC to be able to plan profitable interactions. Within this framework there are a myriad of possibilities to direct customer behaviour to optimise customer online profitability. To add concepts of direct marketing, such as creating and maintaining a relationship, to the CLC banks and other financial institutions might have a better understanding of customer development and retention on a web-banking site. With the CLC as an appropriate framework banks will know how to guide new customers and how to intervene in undesired behaviour or pending inactivity. This framework is an important key to integrate Internet banking in the direct-marketing strategy.

Chapter 3   An appropriate research methodology to analyse online banking behaviour

Abstract

Since the inception of the Internet, the ability of websites to track the behaviour of their visitors has been considered one of the most promising facets of the new medium. However, many financial services providers perceive the Internet as a 'black box' in which little insight is provided into individual-level online behaviour. Clickstream analyses open up the black box and illuminate online banking behaviour. This chapter describes the benefits of clickstream analyses, which is an appropriate research methodology for integrating the Internet in the direct-marketing strategy of a bank.

3.1   Introduction

Since the inception of the Internet, the ability of websites to track the behaviour of their visitors has been considered one of the most promising facets of the new medium. The detailed records of web usage behaviour provide researchers and practitioners with the opportunity to study how users browse or navigate websites and to assess the performance of these sites in a variety of ways (Bucklin & Sismeiro, 2002). Walsh and Godfrey (2000) mentioned that the Internet offers a number of advantages. They reported that e-tailors are able to collect and analyse an extensive amount of information continuously, in a very short time and at relatively low costs. Many online retailers monitor visitor traffic as a measure of their stores' success. However, summary measures, such as the total number of visits per month, provide little insight about individual-level shopping behaviour. As a consequence they are unable to integrate the Internet in their direct-marketing strategy. Walsh & Godfrey (2000) mentioned three types of data:

(1) personal information provided on registration or via self-completion questionnaires

(2) purchasing habits

(3) clickstream or site navigation

This study is focussed on the third type of data: data from clickstream navigation. Kimball and Merz (2000) see the clickstream as a new and exiting data source: "the clickstream contains a record for every page request from each visitor to our site; in many ways, can imagine that the clickstream is a record for every gesture each visitor makes, and we are beginning to realize that these gestures add up to descriptions of behaviour we have never

been able to see before". Clickstream analyses have a few important benefits in analysing online banking behaviour.

In this chapter, clickstream analyses is introduced as an appropriate research methodology for analyzing online banking behaviour. The benefits of clickstream analyses are described. Based on our experiences over the past years these benefits are elaborated in this chapter. In chapter 4 several examples of statistical techniques are shown how to analyse customer online banking behaviour.

3.2 Clickstream data

In what way is it possible to analyse visitors' clicking pattern? The collection of data from clickstream or site navigation is needed. A webserver logs each and every mouse-click. The term 'click-stream' denotes the path a visitor takes through a website. This pathway reflects a series of choices made within a website. The experimental studies in this dissertation are based on experiences with clickstream data from an Application Server Provider (ASP). An ASP is a third party 'observer' that collects clickstream data from a website. A pixel gif is a small snippet of HTML code that is inserted into every page the bank wishes to be tracked. Each requested page sends a signal to the ASP. The ASP logs each interaction between the visitors and the website. A file with clickstream data is like a maritime log: a detailed description of all the peregrinations on the site. In the clickstream data other type of user info, for example screen resolution, browser plug-ins and other type of technical information can be inserted. Also additional custom analytic variables (e.g. search strings) can be inserted into the pixel gif. Moreover, ASP generates a single data file to import for analyses. There are different levels of granularity of clickstream data. What types of components are logged depends on the configuration of the server. The following types of components are most essential: ip-address, date and time, transfer log, referral log and type of browser etcetera. Table 3.2 shows an example of clickstream data.

Table 3.2   *Example of clickstream data*

ip address_cookie	date_time	method	referral	status	ip	browser
62.166.17.62.290501067645290136	[01/Nov/2003:00:08:10	GET	/clickin?portal=zon&banid=1480&soort	200	http://www.internetmortgage.nl/14	Windows2000
62.166.17.62.290501067645290136	[01/Nov/2003:00:10:01	GET	/14/doc/home.html?	200	http://www.internetmortgageauctio	Windows2000
62.166.17.62.290501067645290136	[01/Nov/2003:00:11:25	GET	/doc/howdoesitwork.html?	200	http://www.internetmortgageauctio	Windows2000
80.61.213.100.16011106764619055	[01/Nov/2003:00:23:10	GET	/clickin?portal=pi&banid=nb&soort=txt	200	http://www.internetmortgage.nl/ho	Windows2000
80.61.213.100.16011106764619055	[01/Nov/2003:00:25:50	GET	/home/	200	http://www.internetmortgage.nl/ste	Windows2000
81.59.3.97.280701067185542568	[01/Nov/2003:00:37:07	GET	/clickin?portal=pi&banid=nb&soort=txt	200	http://www.internetmortgage.nl/ho	Windows2000
62.59.144.37.57291067647027141	[01/Nov/2003:00:37:17	GET	/clickin?portal=zon&banid=1480&soort	200	http://www.internetmortgage.nl/14	Windows2000
62.59.144.37.57291067647027141	[01/Nov/2003:00:38:09	GET	/14/doc/example.html?	200	http://www.internetmortgageauctio	Windows2000
80.61.105.112.14449106447406642	[01/Nov/2003:00:38:17	GET	/clickin?portal=zon&banid=1480&soor	200	http://www.internetmortgage.nl/16	Windows2000
80.61.105.112.14449106447406642	[01/Nov/2003:00:38:41	GET	/16/doc/home/html?	200	http://www.internetmortgagecalcula	Windows2000
62.59.144.37.57291067647027141	[01/Nov/2003:00:38:42	GET	/doc/howdoesitwork.html?	200	http://www.internetmortgageauctio	Windows2000
80.61.105.112.14449106447406642	[01/Nov/2003:00:38:52	GET	/doc/example.html?	200	http://www.internetmortgagecalcula	Windows2000
213.17.23.97.281271067647132199	[01/Nov/2003:00:39:19	GET	/clickin?portal=zon&banid=1480&soor	200	http://www.internetmortgage.nl/16	Windows2000

For a more detailed description of different types of log components and types of collecting clickstream data see Linoff & Berry (2002); Kimball & Merz (2000); Mattison (1999); and Mena (1999).

3.2.1   Pre-processing clickstream data

To guarantee the reliability of research findings, data files have to be of high quality. The quality of 'raw clickstream data' is most of the time poor, because there are sessions with only one page request (more later a out web spiders) and/or page requests are unrecognizable. Depending on the granularity of the data in the imported file, data preparation is therefore necessary and worthwhile. Pre-processing consists of converting usage information contained in the various data sources into the data abstractions necessary for pattern discovery. The extraction, transformation, and loading (ETL) mechanism is appropriate to get data from where it is created to the data warehouse where it will be used. Data extraction is concerned with extraction from the data sources on an ongoing basis. The transformation programs do basic translations such as character set conversion or translating codes into human-readable equivalents. The loading process involves that new or changed dimension data must be processed before data can be loaded into the data webhouse (Sweiger et al., 2002). Analyzing activity at the lowest level of granularity, the page hit, is useful for generating site traffic statistics and calculating many different metrics associated with site administration. But most businesses analyses use activity from a page or session perspective, requiring two new aggregate tables at the page activity and session activity levels (Sweiger et al., 2002).

The treatment of outliers, errors and incomplete data that can easily occur due to reasons inherent to web browsing (Batista & Silva, 2001), is a relevant part of data pre-processing. A few difficulties with collecting and analyzing clickstream data to evaluate users' navigation behaviour are discussed. The first problem is caching. Web clients save previous visited pages in the cache to reduce the traffic on the server and the costs. As a result, when a person hits the Back button in the browser there is no contact with the server to tell it that the user went back to an earlier page. The page will be loaded from the browser's cache unless the site makes an explicit effort to prevent caching (Sweiger et al., 2002). Based on all this caching, one can see why counting pages in the web server logs could significantly underreport site traffic. Only HTTP transactions that make it to the web server are logged and therefore trackable in the clickstream data warehouse. Because of browser-level web page caching or upstream content caching at user proxies like ISP's, many HTTP requests never make it to the web server (Sweiger et al., 2002). Cooley et al. (1999) use knowledge of the structure of the site to solve the problem of caching: if two pages are not connected but directly visited after each other, this means that a cache-page connected to both pages is revisited.

The second problem with collecting clickstream data is proxy servers. In the web server log all requests potentially represent more than one user. Proxy servers provide an intermediate level and create even more problems with identifying site usage (Cooley, 1999). Also, due to proxy server level caching, a single request from the server could actually be viewed by multiple users throughout an extended period of time (Cooley, 1999).

Other impediments to collecting reliable usage data are web spiders. Web spiders are searching the site, but do not understand the site. Web spiders are robots and they leave non-human tracks behind that are thus misleading for understanding visitors' navigation behaviour (Spiliopoulou, 2000).

Aside from counting visitors to your website, other important information you want to obtain is the number of unique sessions, determined by the different and unique IP addresses in your access log file (Mena, 1999). However, this can be misleading due to the fact that dial-up users are assigned a 'dynamic' IP address by their Internet Service Provider (ISP) from a reserved lot. And, corporate users typically connect through proxy servers, which means, that groups of individuals use the same address. This means that it is very difficult to identify an individual with a unique IP address. This fact leads to two conclusions: (1) sessions are more important than individual addresses, and (2) tracking by other means is necessary whether by cookies or forms (Mena 1999). Cookies are small text files created by servers on visiting

browsers' hard disk that contain an identification code. They are passed by servers to browsers so that each time a website visitor returns to a server that passed the cookie, it can recognize it and read what it wrote before, such as what pages were visited during the prior session. Internet users with a broadband connection have a fixed and unique IP address.

The problem is that visitors of public sites are invisible without clear definitions of a user. People come to the site, leave footprints and move on. However, those footprints are merely an indication that they were there and tell you nothing about the people who made those marks (Cutler & Sterne, 2000). Nowadays, banks have a web-banking application, where customers are able to perform transactions such as fund transfer or bill payment. Each customer has a unique identification number, for example an account number or relation number to gain access to the online application. With web-banking sites it is necessary to log a unique user identification key of the visitors in the clickstream data to recognize online customer behaviour at an individual level.

Standard definitions of core measurements must be determined. It is important that companies have a good grasp on the basic concepts of hits and/or page views. However, there is more discussion about a standard definition of a session. Ideally each user session gives an extract accounting of who accessed the website, which pages were requested and in which order, and how long each page was viewed (Mobasher et al., 2000). This study follows previous research and assumes that a page request starts a new session if it requested after an idle period of at least 30 minutes (Catledge & Pitkow, 1995).

3.3   Analyzing clickstream data

Information that reflects online banking behaviour can be extracted from a file with clickstream data by applying data mining techniques. Data mining can be defined as the iterative process of detecting and extracting these patterns from large databases: it is a kind of pattern recognition. Data mining lets us identify "signatures" hidden in large databases (Mena, 1999). Mining clickstream data is also defined as the process of applying data mining techniques to the discovery of usage patterns from web logs data, to identify web users' behaviour (Batista and Silva, 2001). The concept of applying data mining techniques to web server logs was first proposed by Mannila and Toivonen (1996); Yan et al., (1996); Chen et al., (1998) and Cooley et al. (1999). Since then many studies were conducted in this field, but not so many in the field of financial services.

By analyzing clickstream data of a visitor's session it is possible to have a clear insight into the visitor's online behaviour in detail. Not only descriptive analyses, but also exploratory analyses on clickstream data are possible to get a better understanding of customers' online behaviour. This dissertation suggests that clickstream analysis operates as a tool for:

1) Optimising the website. Below and in chapter 4 the following applications of website optimisation are described: website usage, and online banking behaviour.

2) Directing customers. In chapter 5 the following applications of directing customers are described: customer online development and retention.

Most financial services providers perceive the Internet as a 'black box' in which little insight is provided into customer online behaviour. Clickstream analysis is an appropriate research methodology to understand online banking behaviour at an individual level.

3.3.1   Website usage

It is necessary for e-marketers to monitor the usage of the site. Monitoring means following and evaluating actual number of page views, sessions and visitors. Therefore, time series are needed to visualise the site's usage per month, per day or even per second. Clickstream analyses can function as an early warning system for the performance of a site. When the number of page requests suddenly drops or the number of errors generated by the server increases, this signals that the website faces performance difficulties. With the result that customers cannot enter the website. Clickstream analyses may not only contribute to commercial, but also to operational benefits.

Clickstream analyses may function as a barometer. Whatever happens is registered very precisely. Time series are very sensitive for any small change in website usage. With the proper infrastructure, monitoring website usage is possible from day-to-day or even in real time.

3.3.2   Online banking behaviour

You cannot manage what you do not measure, and you cannot measure what you do not define (Cutler & Sterne, 2000). There are many different types of behaviour on a website. How precisely is online banking behaviour defined? Depending on the strategy of the website, only a limited number of visitors' actions is desirable. These actions are measured by 'key performance indicators (KPIs)'. KPIs are important determinants of a successful website, and basically follow from the business process that is being supported by the site. It is possible to specify different types of desirable online banking behaviour, i.e. KPIs. E-marketers, together

with researchers, must make a list with KPIs for each website. KPIs should be monitored continuously. Down here are a few examples of KPIs listed.

KPIs of a corporate website:
- number of visitors' sessions
- number of page requests with the actual saving rates
- number of page requests for a mortgage quotation
- number of 'click-throughs' to the web-banking site
- number of clicks on banners of commercial campaigns
- number of information requests for insurance, or loans
- number of requests for the small business newspaper
- number of helpdesk requests

KPIs of a web-banking site:
- number of online subscribers
- number of visitors' sessions
- number of 'active users'
- number of online payments and savings
- average online stock deposits
- number of helpdesk requests

Perhaps from exploratory clickstream analyses also other useful and interesting KPIs can be found. Again, it is necessary for e-marketers to monitor KPIs of the site. Therefore time series of the specified KPIs are needed to visualize the site's usage in a time perspective. With the help of clickstream analyses a possible decline may already be discovered in an early stage. E-marketers and content managers should find out what caused the decline and stop it.

Based on this type of information marketers are capable to follow the KPIs at a detailed level. It is important to monitor the key performance indicators of a website. Time series are suitable to visualise the usage of a website, and the different types of online banking behaviour on a website. Time series are ideal evaluation tools. E-marketers must set themselves explicit targets for the KPIs. Alterations in the design of the website are also measured. With the proper infrastructure, time series could be reported automatically and displayed in every desired format for the end-users.

Relationship between visitors' surfing behaviour and KPIs
Every company strives to reach the KPI targets. How can a bank improve and adjust the website to reach the targets? An analysis how the design of the website contributes to realize the KPI targets is needed. Detailed analyses of visitors' surfing behaviour detect which parts

of the website are more or less useful or absolutely important for the KPIs. With this type of analysis previously unknown relationships are extracted.

Clickstream analyses offer ideas for new content. The consequences of the various alternations on the websites are evaluated. Clickstream analyses function as a monitor for a system of KPIs as well as a tool for optimising the structure and content of a website.

Segmentation of visitors' sessions

To gain insight into visitors' behaviour on a website researchers need to analyse what groups of pages are requested within a session. If there are distinct clusters of pages, segmentation of surfing behaviour of visitors is also possible. It is assumed that a visitor begins a session with a specific need for information. The design of the website should match visitors' needs. If a customer wants something from his or her bank, it is just one mouse-click away on the Internet. Therefore a segmentation of visitors' sessions - different types of information needs - is necessary for optimising the website. The segmentation is based on different typologies of sessions. Typology of sessions helps to differentiate in communication with different types of visitors. A proper segmentation provides the right information about how to steer customers directly to the KPIs. It is clear that this information helps content managers to decide which part of the website needs more development and what part does not. Clickstream analysis operates here as a tool for optimising the website as well as directing customers through the website.

3.4   From clickstream analyses to an appropriate research methodology

Referring to the second research question (see section 1.4) banks and other financial institutions need an appropriate research methodology to be able to analyse and monitor customer online behaviour at an individual level. There are two steps defined in the suggested research methodology:

Step 1: Finding important relationships between certain types of behaviour and KPIs using 'exploratory statistical techniques' on the clickstream data. In section 3.3 some real-world applications of statistical exploratory techniques are described. These techniques allow the researcher to play with the clickstream data. Perhaps unknown important factors are extracted from the data. Section 4.2.3 shows a real-world application of analysing the relationship between visitors' surfing behaviour and a KPI on a web-banking site.

Step 2: Monitoring the KPIs and other important factors using clickstream data. In section 3.3 some real-world applications of tracking 'online behaviour' using time series on the clickstream data are described. Time series show the sensitivity of the clickstream data. This step is also defined as Statistical Process Control (SPC). The essence of SPC is to adjust and closely monitor the process at each stage (Sheth & Sisodia, 2002). SPC uses structured statistical analysis to determine if a process is in control and capable to produce the product or service that satisfies customers. Section 4.2.2 shows a real-world application of monitoring a KPI on a web-banking site.

3.5   Clickstream analyses versus market research

Most banks and other financial institutions use Online Analytical Processing (OLAP) tools for reporting on traffic on their websites, for example the number of visitors' sessions. The basic difference between OLAP and exploratory statistical analyses is that the latter operates 'bottom up' and as 'need-to-discover' on the data.

Besides OLAP tools companies also invest a lot of resources in market research. The outcomes of market research contribute to the development and the optimisation of products, services and websites of a company. For this purpose market research is an appropriate research methodology. However, market research asks customers what they think, need or wish. There is a gap between what people say and what they actually do. Comparing with market research clickstream analysis has the following advantages: (i) clickstream data are collected unobtrusively and based on observed behaviour, (ii) there are no perversions due to researcher interaction, and (iii) time pattern and order of activity is recorded. Although expensive market research projects are conducted, the free clickstream data of visitor's behaviour on the website are still hardly analyzed.

3.6   Some conclusions

Many financial services providers consider the Internet as a 'black box'. Summary measures of site traffic, such as the total number of visits per month, delivered by OLAP-tools, provide little insight into online behaviour at the individual level. Consequently, they are unable to analyse and interpret customer online behaviour at an individual level. Clickstream analyses open up the black box and illuminate online banking behaviour of customers. The detailed records of web usage behaviour provide researchers and practitioners with the opportunity to

study how users browse or navigate websites and to assess the performance of these sites in a variety of ways.

The opportunities for clickstream analyses are far-reaching. The following applications of clickstream analyses in order to understand online banking behaviour were described:

♦ Website usage: time series are accurate and easily show trends in visitors' behaviour. Monitoring website usage with basic statistics foster decision-making to counteract on a possible decrease of total number of sessions. As a result clickstream analyses integrate client focus into the daily operation. Section 4.2.1 shows a real-world application of website usage.

♦ Online banking behaviour: depending on the strategy of the website, only a limited number of visitors' actions is profitable. These actions are defined and measured by 'key performance indicators (KPI)'. KPIs are important determinants of a successful website. KPIs should be measured continuously with time series. Based on the past figures marketers or managers may put future targets. Clickstream analyses may help to optimise the profit of a website. Section 4.2.2 shows a real-world application of monitoring a KPI on a web-banking site.

♦ Relationship between visitors' surfing behaviour and KPIs: banks face problems in a lack of knowledge how to construct a website to optimise KPIs. How can content managers improve and adjust the website to reach or even exceed the KPI targets? Exploratory analyses of what types of page visits are related to the KPI show which pages are increasing the probability of reaching the KPI target. Clickstream analyses function as a tool for optimizing the structure and content of a website. Section 4.2.3 shows a real-world application of analysing the relationship between visitors' surfing behaviour and a KPI on a web-banking site.

♦ Segmentation of visitors' sessions: the design of the website should match visitors' needs. The author assumes that a visitor begins a session with a specific need for information. If a customer wants something from his or her bank, it is just one mouse-click away on the Internet. Therefore a segmentation of visitors' sessions is absolutely necessary for optimising the website. Section 4.2.4 shows a real-world application of a segmentation of visitors' sessions on a web-banking site.

These applications show that clickstream analyses functions as (1) a monitor for a system of KPIs as well as (2) a tool for improving the structure and content of a website. Analyzing customer online behaviour at an individual level proved to be an appropriate way to optimize

the website. Based on experiences with clickstream analyses the benefits, in contrast to other tools, are:

♦ Clickstream analyses operate as need-to-discover on the clickstream data. Perhaps unknown important factors are extracted. Hidden relationships between certain types of surfing behaviour and KPIs may be found. Clickstream analyses are able to explain the mechanism of the measured behaviour at the individual level.

♦ Clickstream data are collected unobtrusively and based on observed behaviour, and time pattern is recorded. Clickstream data displays customers' online behaviour in detail. This type of data source can be enriched with customer information from the back office. Thus, not only online customer behaviour can be viewed, but also customer behaviour through multi-channels like mail or telephone.

Just the presence of a new data source is not necessarily sufficient to call for a new program of research (Bucklin et al., 2002). Existing research techniques to analyze and to understand financial behaviour on the Internet were used. Future research should find out whether or not online banking behaviour is any different from offline banking behaviour. If it is not, then researchers already have a suitable research paradigm and a wide range of research techniques for analyzing online behaviour.

Chapter 4 Clickstream analyses of customer behaviour on a web-banking site

Abstract

Clickstream analysis is an appropriate research methodology to analyse and to interpret online banking behaviour at an individual level. There is a wide range of statistical research techniques for analyzing clickstream data. Several examples are provided to show what types of techniques can be used to analyse online banking behaviour. These research activities show that analyzing clickstream data is an appropriate research methodology to understand online banking behaviour and to optimise the website.

4.1 Introduction

By analysing clickstream data it is possible to have a clear insight into visitor's behaviour in detail. Information that reflects online banking behaviour at an individual level can be extracted from a file with clickstream data by applying exploratory statistical techniques. What types of techniques can be used to analyse online banking behaviour? Not only descriptive analyses, but also exploratory analyses on clickstream data are possible to get a better understanding of customers' online behaviour. Several statistical techniques, that are suitable for this purpose, are described in this chapter. These research activities show that several techniques for analyzing clickstream data are appropriate in order to optimize the web-banking site.

This chapter reports on a real-world application of customer behaviour on a Dutch web-banking site using clickstream d ta from financial institutions in The Netherlands. Based on our experiences over the past years a number of benefits of clickstream analyses are elaborated with examples from practice.

4.2 Empirical study: Customer online behaviour on 'Mortgages Online'

The website involved is a web-banking site that will be called 'Mortgages Online (MO)'. In appendix 1 a screen-dump of the homepage of MO (in Dutch) is provided. MO is a website, specific for mortgages, where visitors could find background information about mortgages, calculation tools (for example 'maximum mortgage' or 'net month pay'), modules to compare different types of mortgages, and submit an online request for a free advice about a mortgage from someone from the bank.

Clickstream data of MO during the period July 2002 to June 2003 was analyzed. During this period, 1.3 million pages on the website were requested, which made up about 230,000 sessions. Sessions with two and more page requests were selected.

As mentioned before, visitors could find and submit an online request for a free advice about a mortgage from someone from the bank. Unfortunately the clickstream data contained no 'unique user key' so there was no data if customers actually bought a mortgage at the end or not. The more visitors complete the application form the better. This is key performance indicator of the website, because that is the most important commercial gain of MO. However, MO lacked the insight into customer online behaviour on MO and wanted to optimise the design of the website in order to receive more completed forms. Several statistical techniques that are suitable for this purpose, are described in this chapter. These research activities show that analyzing clickstream data is an appropriate research methodology for optimising the web-banking site.

4.2.1 Website usage of MO

Due to proxy servers being used it is difficult to identify online behaviour of an individual based on their ip-address. Assigning cookies to a visitor's session is necessary to avoid this problem. However, a cookie is not always a unique visitor, because more than one person in a household may be using the same computer to access the website. During the analysis period about 210,000 cookies were assigned. In the table 4.2.1 percentages of the number of cookies are shown.

Table 4.2.1   Percentage of the number of cookies

number of sessions	perc. %	perc. cum %
1	89.93	89.9
2	7.43	97.4
3	1.51	98.9
4	0.52	99.4
5	0.24	99.6

It appeared that almost 90% of the cookies on MO had only one session. About 7 % of the visitors with an assigned cookie return to MO for a second session.

What is the development of website usage over time? It is necessary for e-marketers to monitor the usage of the site. Time series are needed to visualise the site's usage per month,

per day or even per second. Because mortgages are relatively high involvement products (compared to, for example, savings), it is decided to plot customer activity per day. Figure 4.2.1 shows the number of sessions per day on MO from July 2002 to April 2003.

Figure 4.2.1   Total number of sessions per day on MO from July 2002 to April 2003
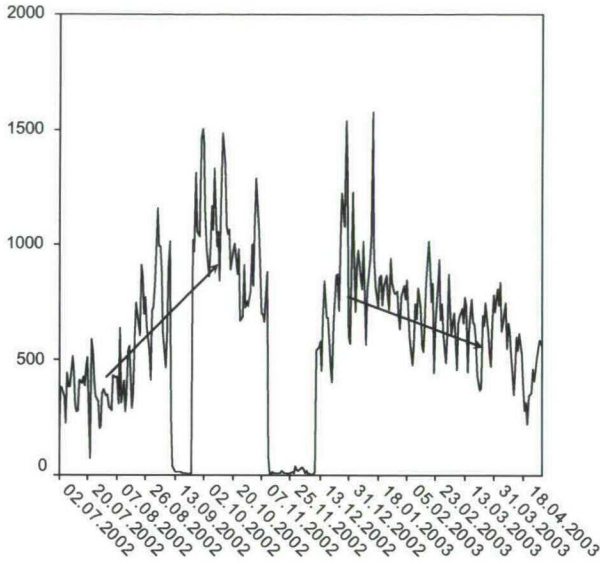
It appeared that during the months July until September there was a growth in the number of sessions. And, during the months January until April there was decline in the number of sessions. There are also a couple of peaks in the figure, for example at the beginning of May 2003. This sudden increase of website usage is caused by an advertising campaign.

It is also clear from the figure that during two periods in 2002, September and November/December, there was unfortunately no data collection of MO. The reason is a modification of the configuration of the web server during these periods.

4.2.2   Online banking behaviour on MO

Only a limited number of visitors' actions are beneficial to the bank. These actions are measured by 'key performance indicators (KPIs)'. KPIs are important determinants of the success of MO. The most important KPI of MO is that visitors could complete an online application form for a free advice conversation with someone from the bank. Time series are needed to visualise the site's usage per month or per day. Figure 4.2.2 shows a time series of

the total number of sessions (= activity), and the total number of requests for a form for a free advice conversation (KPI), per day in the period January 2003 to May 2003.

Figure 4.2.2   Time series of total number of sessions and total number of requests for a free conversation (KPI)
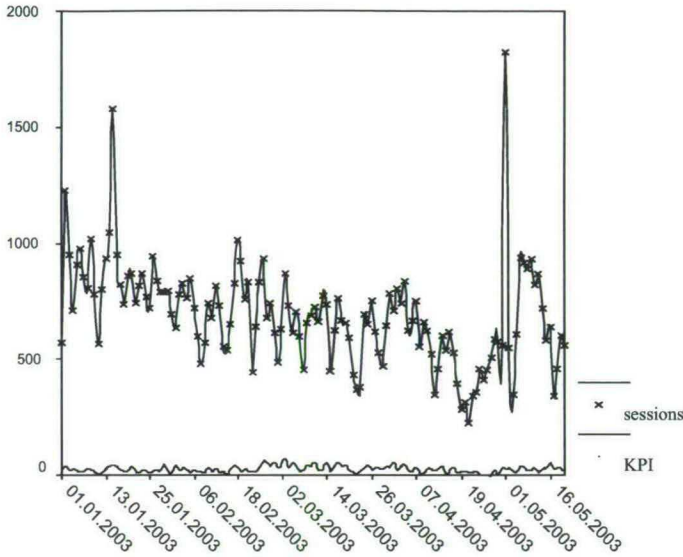
Due to a direct marketing (offline) campaign there is an enormous rise of sessions (online) in May 2003. Unfortunately, the traffic on the website had no proportional effect on the number of submitted forms (= KPI). It shows clearly that time series are very sensitive for any small change in website usage. Researchers and e-marketers must find out what might be the explanation. With the help of clickstream analyses a decline may already be discovered in an early stage. Based on these findings they should consider proper actions to counteract on this adverse behaviour and to stimulate desirable behaviour on the website.

4.2.3   Relationship between visitors' surfing behaviour on MO and a KPI

Visitors could find and an online application form for free advice from someone from the bank; this is a KPI. The more visitors complete the application form the better. In order to reach the KPI targets MO had to improve the website to reach the targets. Therefore detailed analyses of visitors' surfing behaviour detect which parts of the website are more or less useful or absolutely important for the KPIs. The relation between visitors' surfing behaviour and a KPI is analysed on MO. On this website visitors could also find different types of calculation tools: type of mortgage; maximum mortgage per month, net month pay; existing

house; and new house. Figure 4.2.3.1 shows a time series of total number of sessions using a calculation tool on MO in the period January 2003 to May 2003. In the legend the calculation tools are sorted in sequence of popularity.

Figure 4.2.3.1   *Time series total number of sessions per calculation*
tool on MO from January 2003 to May 2003
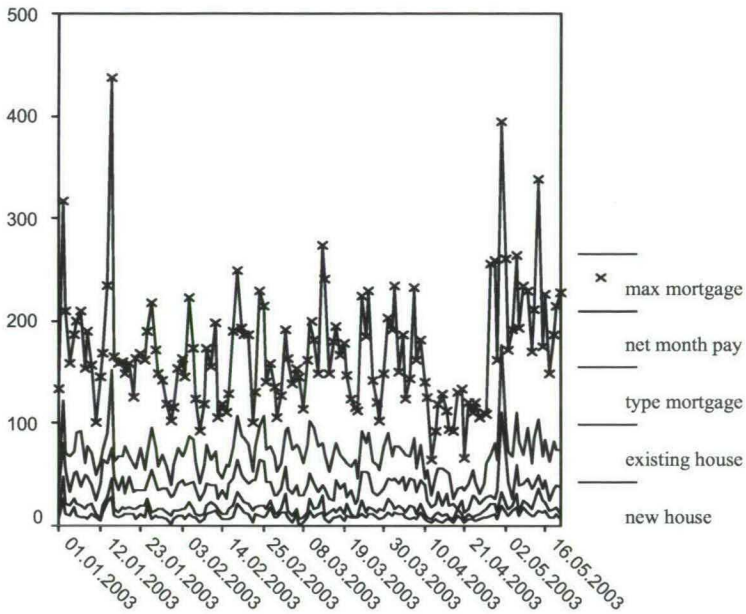
During this period maximum mortgage per month was by far the most popular calculation tool on MO.

A logistic regression using clickstream data, with the 'online application form for a free advice conversation with a representative from the bank' as a dependent variable and the 'page requests related to the calculation tools' as independent variables, shows which type of calculation tools are increasing the probability of reaching the KPI target. Figure 4.2.3.2 shows the regression and correlation coefficients of what types of calculation tools contribute to the number of completed requested forms. The analysis period was July 2002 to May 2003.

*Figure 4.2.3.2   Regression and correlation coefficients of what types of calculation
tools contribute to an online request of a free advice conversation*
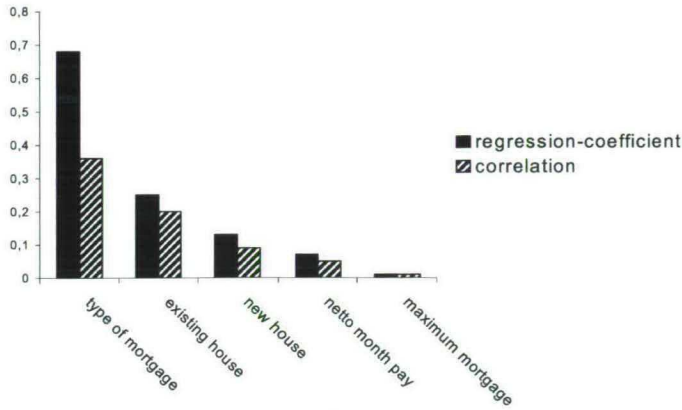
*y- axis contains regression- and correlation coefficients, which indicate
the relationship with online request of a free advice conversation*

The explained variance (R-square) of the relationship between the calculation tools
(independent variables) and the online request form (dependent variable) was 0.24. It
appeared that sessions visiting 'type of mortgage' had the highest probability to complete the
application form for a free advice conversation. Maximum mortgage had the lowest
probability. An explanation might be that the tool maximum mortgage was probably
requested by people that were not able to meet the requirements for a mortgage.

The percentage of completed forms in proportion to the total number of sessions (within the
section with the calculation tools) is 2.7%. Table 4.2.3 shows which type of calculation tool is
most successful. The analysis period is July 2002 to May 2003.

*Table 4.2.3   Percentages of completed forms on the total number of
sessions within the section with the calculation tools*

calculation tool	perc. %
type of mortgage	3.8
existing house	3.1
new house	2.8
net month pay	2.2
maximum mortgage	1.4

Although maximum mortgage was the most popular calculation tool, it offers the lowest
likelihood as a predictor for the online request for an advice conversation. If content managers
of MO want to increase the number of completed forms, they should improve the link from

'maximum mortgage' to the online request of a free advice conversation. Clickstream analyses functions as a monitor for a system of KPIs as well as a tool for optimising the structure and content of a website.

4.2.4 Segmentation of sessions on MO

The design of MO should match visitors' needs. A segmentation of visitors' sessions - different types of information needs - is necessary for optimising the website. The segmentation is based on different typologies of sessions. It is assumed that a visitor begins a session with a specific need for information. Typology of sessions helps to differ in communication with different types of visitors. Two steps are followed to be able to make an appropriate segmentation of the sessions on MO:

Step 1: Correspondence analysis. There are very many pages on a website. To explore what pages are related to each other 'correspondence analysis' is needed. With the help of correspondence analysis a small group of pages are created.

Step 2: Cluster analysis: With the help of cluster analysis it is possible to cluster the uniform groups of pages to a small number of meaningful typologies of sessions. The reason to use correspondence analysis at first and subsequently cluster analysis is to downsize a large number of page requests into a small number of groups of page requests.

To explore what pages are related to each other 'correspondence analysis' is needed. Correspondence analysis visualizes the hidden structure in the datamatrix (Benzécri, 1973; Greenacre, 1984). It is a multivariate representation of a contingency table containing information about combinations of the requested pages during one session. The 'principal inertion' of the algorithm qualifies if the representation is acceptable, and what is the importance of the axes (proportional variance) for the total solution (Hoffman & Franke, 1986).

MO wanted to know more about the customer online behaviour within the section with the calculation tools. All pages related to the calculation tools on MO were analysed (CORWIN) in order to find groups of pages within a session. In table 4.2.4.1 a few parameters of the correspondence analysis of the requested pages are provided.

Table 4.2.4.1   Correlation and explained variance of the correspondence analysis

Factor	1	2	3	4
correlation (Rho)	0.44	0.31	0.25	0.22
explained variance (Tau)	0.39	0.19	0.13	0.10
cum. explained variance (Tau)	0.39	0.59	0.72	0.81

note: Chi-square = 556,955.70; df = 361

It appears that factors 1 and 2 provide a relatively acceptable view of the relations; the cumulative Tau is 0.59. The relationship between factors 1 and 2 is visualized in figure 4.2.4.1. Pages in the figure that are requested relatively often within the same session are lying close to each other. And, pages that are not combined in the same session are far apart on the website.

Figure 4.2.4.1   Correspondence-Analyse on pages Calculation tools – factor 1 (x-axe), 2 (y-axe)
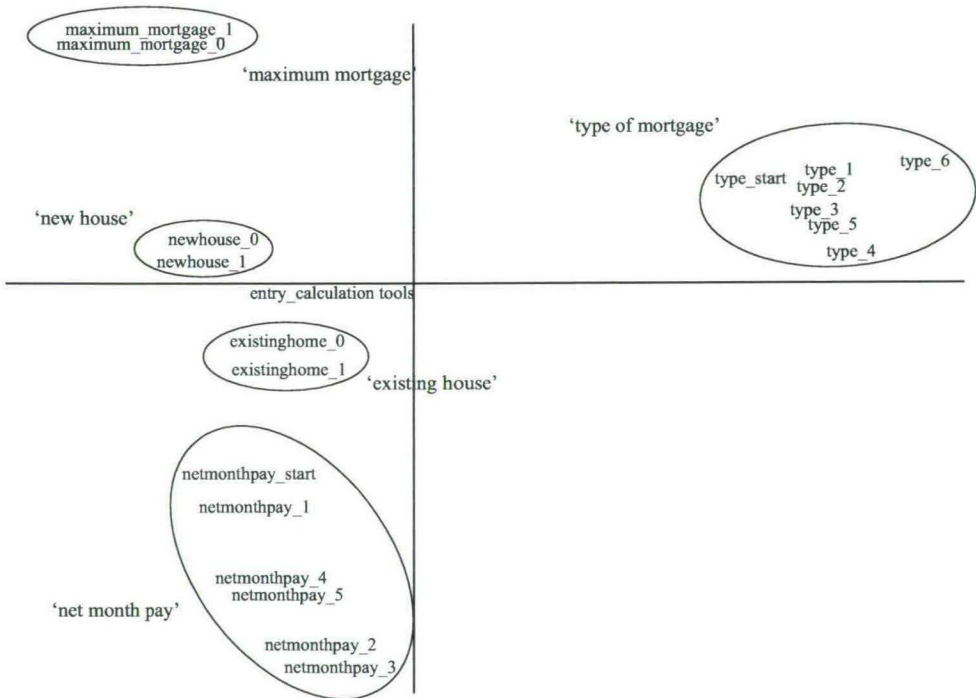
The entry page for calculation tools is in the centre of the figure near at the intersection of the X and Y axes. It appears that the pages related to calculation tools form five distinct groups. However, the calculation tool 'type of mortgage' is infrequently visited in combination with other calculation tools.

Are there identifiable groups of customers with similar online behavioural characteristics? To find typologies of sessions on MO a hierarchical cluster analysis is conducted on groups of pages (with correspondence analyses the author ultimately found twelve uniform groups of pages, including the five distinct groups of pages of Calculation tools). The cluster analysis attempts to identify relatively homogeneous groups of pages on selected characteristics. This procedure can be used to identify segments that can be selected to test various marketing strategies.

Sessions within the same cluster have more or less equal numbers of requested pages from this same cluster. In table 4.2.4.2 the segments on MO are shown. Numbers in the table with relatively high row and column importance are bold. In table 4.2.4.2 the following are also calculated: (a) average number of pages per session, and (b) average number of duration per session in minutes (these are not included in the cluster analysis).

Table 4.2.4.2   Typologies of sessions from cluster analysis on 12 groups of pages

groups of pages	sessions typologies							
	Mean	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
info features of mortgages	0.0	1.2	0.3	**5.4**	1.8	3.5	2.0	0.0
info types of mortgages	0.1	3.1	0.3	**7.2**	4.3	4.6	1.7	0.0
info interest and term	0.0	0.5	0.1	2.6	1.9	2.3	1.8	0.0
info mortgage round off	0.0	0.0	0.1	3.2	1.0	4.1	0.2	0.0
calculation tool types of mortgages	0.4	4.5	6.5	1.0	0.8	**12.1**	**11.7**	0.0
calculation tool net month pay	0.6	2.0	3.4	4.2	0.1	**11.7**	0.2	4.0
calculation tool maximum mortgage	1.2	3.2	4.3	4.6	0.5	**20.5**	0.0	0.0
calculation tool present house	0.2	0.1	2.5	1.8	0.1	1.7	2.7	2.0
calculation tool new house	0.1	0.6	0.7	0.2	0.1	1.5	0.0	2.0
compare and submit	3.9	**9.6**	**8.4**	**8.4**	6.1	**35.9**	4.3	2.0
advice	0.0	0.2	0.3	0.0	0.4	1.5	0.2	1.0
about us	0.0	0.2	0.1	0.6	0.3	1.9	0.0	0.0
Average number of pages per session	8.4	32.2	31.9	51.0	21.7	118.3	30.8	11.0
Average duration per session (min.)	34.7	123.0	78.1	112.9	50.2	140.9	12.6	62.4

It is possible to cluster six out of the twelve groups of pages into three meaningful typologies of sessions. The following unique typologies of sessions are discovered:

I   'Compare and submit'

II   'Compare and submit' & calculation tools 'Types of mortgages', 'Net month pay', and 'Maximum mortgage'.

III   'Compare and submit' & background information about 'Types of mortgages' and about 'Features of mortgages'.

57

In table 4.2.4.3 combinations of the three unique typologies of sessions are shown.

Table 4.2.4.3   Combinations of the three typologies of sessions on MO

Typology of session	%	cum %
compare and submit	48.5	48.5
compare and submit & calculation tools	37.5	86.0
compare and submit & background info about mortgages	6.5	92.5
compare and submit & calculation tools & background info mortgages	5.8	98.3
background info about mortgages	0.9	99.2
calculation tools & background info about mortgages	0.8	100.0

It appeared that 'compare and submit' is responsible for nearly 49% of all sessions on MO. In figure 4.2.4.2 time series of six groups of pages from January 2003 to July 2003 is shown. In the legend the six groups are sorted in sequence of popularity.

Figure 4.2.4.2   Time series of six groups of pages are shown from January 2003 to July 2003
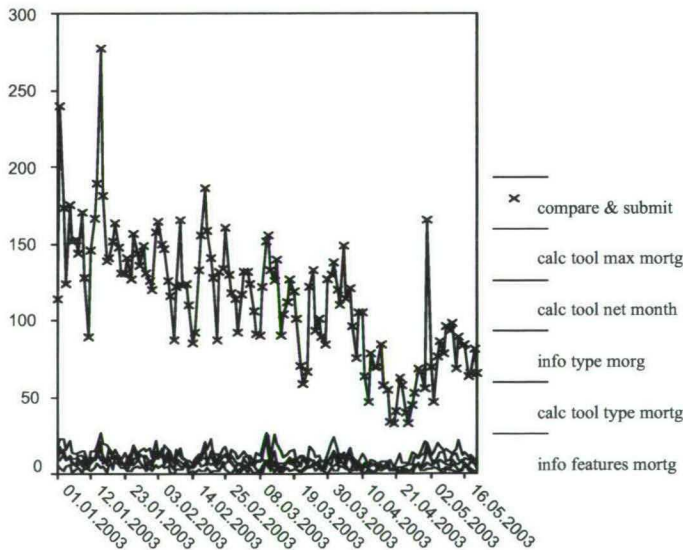
The upper graph in figure 4.2.4.2 is the section 'compare and submit' where visitors can find and submit an online application form for a free advice conversation with a representative from the bank. The 'compare and submit' -sessions are the most important typology of session on MO. As can be observed in figure 4.2.4.2, the number of sessions of typology

'compare and submit' declined from January 2003 to July 2003. The most important typology of session dominates the total website usage.

A proper segmentation provides the right information about how to direct customers to other parts of the website. Clickstream analysis operates here as a tool for optimising the website as well as directing customers through the website.

4.3   Discussion of the findings

On MO visitors are able to find an online application form for a free advice conversation about a mortgage with someone from the bank. The more visitors complete the application form the better. MO lacked the insight into customer online behaviour on MO and wanted to optimise the design of the website in order to receive more completed forms. In order to achieve this, the following two scenarios were recommended:

I.   Improve the link from 'maximum mortgage' to the application form.

All the calculation tools were very popular, and the maximum mortgage in specific. However, the calculation tool maximum mortgage is comparatively less successful in generating completed forms, only 1.4%. MO must improve the link from 'maximum mortgage' to the application form in order to increase the KPI. For example, test the best position or location of the hyperlink to the application forms on the pages of maximum mortgage calculation tool. Another option is to mention the advantages of the offer (= free personal advice about different types of mortgages) once again in such a way that visitors cannot overlook on a position on a page on the website where visitors easily drop out.

II.   Target customers

Three important types of sessions on MO were found. The three segments provide the information about how to direct visitors directly to the online application form. The most important typology of session, 'compare and submit', dominates the total website usage. If the number of sessions of this typology declines, MO must take proper actions to counteract the undesirable decrease. MO should also create three corresponding entries in the navigation menu on the homepage. Based on these segments targeting is possible of customers based on behaviour within a single session or over multiple sessions.

Both scenarios are options to increase the number of completed forms. E-marketers and content managers face the challenge to test the scenarios. Scenario testing on the Internet is a

useful experimental design to prove which modifications to the web-banking site show the highest conversion rates.

The benefits of analyzing clickstream data are described in chapter 3. With several examples from practice this chapter showed that detailed records of web usage behaviour provide researchers with the opportunity to have a precise understanding of consumer preferences. However, the following two aspects are shortcomings of clickstream analyses:

♦ The outcomes of the analyses are closely related with the structure of the website. For example, the segmentation of clickstream data might reflect the lay-out of the website. Preliminary outcomes might be rather obvious. Detailed analyses of visitors' surfing behaviour are needed to discover unknown relationships.

♦ The outcomes of clickstream analyses concern the actual behaviour of visitors. Non-intentional behaviour might be hidden in the data. For example, two visitors show the same clicking pattern on a web-banking site, but they both might have different intentions - or the other way round. Future research is needed to know how to differentiate between intentional and non-intentional visiting behaviour on a website.

It is important to interpret the outcomes of clickstream analyses with a keen understanding and a common-sense.

4.4   Some conclusions

To analyse clickstream data it is possible to have a clear insight into the visitor's online behaviour at an individual level. This chapter showed that clickstream analysis operates as a tool for optimising the website as well as directing customers through the website. There is a wide range of techniques for analyzing online behaviour, for example regression analysis or cluster analysis. These research activities show that analyzing clickstream data is an appropriate research methodology to understand online behaviour at an individual level.

Chapter 5   Clickstream analyses of customer development and retention on a web-banking site

Abstract

To build long-lasting customer relationships financial services providers must identify which visitors develop over time and become established loyal customers. The customer life cycle (CLC) illustrates that a customer's financial behaviour changes over time. According to the CLC the financial services providers strive to develop and maintain customer relationships through different channels, for example by mail, telephone and Internet. Clickstream analyses are needed to differentiate usage behaviour on a website. A real-world application of customer development and retention on a web-banking site using clickstream data from a financial institution is reported. It is shown that visitors and registered customers differ in online activity. Clickstream analysis is an effective tool to have a precise understanding of customers' financial behaviour changes over time at an individual level.

5.1   Introduction

There has been a noticeable evolution in Internet marketing practices. Internet pioneers (or first-movers) were oriented towards technology, and consequently, placed emphasis on the product and its corresponding information. Now, most online companies have moved away from complex products, with their multitude of features, to commodity items like stock quotes and newsletters. The emphasis has shifted from the product focus to the marketing process of reaching and getting close to the customer (Kalakota & Whinston, 1996). To cater to each customer's personal needs, banks and other financial institutions are attempting to create one-to-one relationships with them. To do so, they should align their product and service offerings with the customer life cycle (CLC). The CLC reflects the fact that customer behaviour changes over time, and aids in predicting his or her future online financial activity - see also figure 2.2.1. It is interesting to analyze the activity of new users during their first visits on the website and to identify the way in which the different types of online behaviour develop over time.

Most banks still perceive the Internet as a 'black box' in which little insight is provided into customer online behaviour at an individual level (Van Meer & Van Raaij, 2004). Companies that do not have accurate information or do not optimize customer intelligence are losing a grip on their customers. It is important to analyze and evaluate online behaviour at an individual level. Clickstream analysis is an appropriate methodology to do so. The

clickstream contains a record for every page request from each visitor to the website. By analyzing the clickstream data of a visitor's session, it is possible to gain a clear insight into the visitor's behaviour. Both descriptive and exploratory analyses on clickstream data are possible to obtain a better understanding of a customer's online behaviour.
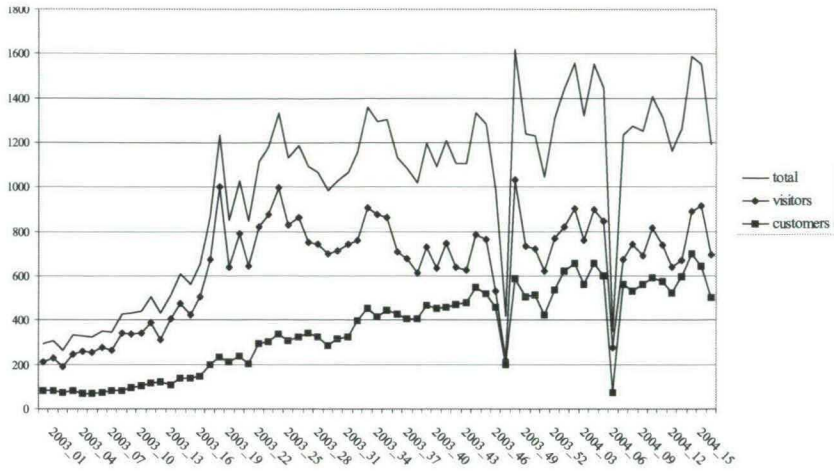
This chapter reports on a real-world application of customer development and retention on a web-banking site using clickstream data from financial institutions in The Netherlands.

5.2   Empirical study: Customer online development and retention on 'Stocks Online'

The website involved is a web-banking site that will be called 'Stocks Online (SO)'. In appendix 1 a screen-dump of the homepage of SO (in Dutch) is provided. SO is a website where visitors can open a personal account to compare and trade international stocks online. Both private customers and professional brokers were using this website. A starting user of SO may (or may not) open a personal account for ordering stocks online. Thus, there is a distinction between visitors and registered customers. Online behaviour of a visitor is tracked by a cookie, but the user remains anonymous. A registered customer is also tracked by a cookie and he or she provides all the necessary personal details to SO.

Clickstream data of SO during the period January 2003 to April 2004 was analyzed. During this period, 3.6 million pages on the website were requested, which made up about 460,000 sessions. The popularity of this website caused an increase of the number of visits, but SO was uncertain about which customers develop over time successfully and which customers leave. Because stocks are relatively high involvement products (compared to, for example, savings), it was decided to evaluate customer activity per week. Sessions with more than two page requests were selected. Figure 5.2 shows the number of visitors per week on SO from January 2003 to April 2004.

Figure 5.2   Number of visitors and customers per week on SO from January 2003 to April 2004

Figure 5.2 shows a growth in the number of customers on SO during the period January 2003 to April 2004.

To gain insight into the routine behaviour of customers online, researchers need to analyze which groups of pages are requested within a session. If there are distinct clusters of pages, it is also possible to segment the surfing behaviour of customers. It was assumed that a customer starts a session with a specific need. If a customer wants something from his or her bank, it is just one mouse-click away on the Internet. The design of the website should reflect the visitor's needs. We need to find groups of distinct types of pages requested in order to find an appropriate segmentation.

With correspondence analysis, groups of pages within a session are found on SO. See for more information and another example of correspondence analysis in section 4.2.4. With Correspondence Analysis the following unique typologies of sessions were discovered:

* Type A: sessions with information about the website of SO (info site)
* Type B: sessions with actual information about stocks (info products)
* Type C: sessions for trading online stocks (transactions)
* Type D: sessions with information about current topics and offers (news)

Based on these segments, targeting of customers based on behaviour within a single session, or over multiple sessions, is possible. With these typologies, it is possible to determine the appropriate method of communication to use with each different type of visitor. Segmentation is one technique for creating this value-added differentiation necessary for optimizing the

website. A typical segmentation approach is behavioural segmentation: dividing the market according to how people behave (Kalakota & Whinston, 1996). For instance, in the case of financial products, one can use behavioural segmentation to distinguish needs according to a customer's position in his or her financial life cycle. Another type of behavioural segmentation is based on differentiation between customers who use a website primarily for transactions, versus those who use them primarily for prospecting and discovering information (Kalakota & Whinston, 1996). In the next section, customer *development* and *retention* in terms of type of session A, B, C and D on SO are described.

5.2.1 Customer development on SO

To build relationships banks must identify which visitors develop over time. To whom should they offer their products? Banks must find out which visitor becomes an active customer and who not. Online behaviour of new users of SO is analyzed. In figure 5.2.1.1 the average number of sessions of visitors and customers in the first eight weeks is shown. In figure 5.2.1.2 the average number of page requests per session of visitors and customers in the first eight weeks is shown. The averages are affected by visitors who are not active on SO at all during the first eight weeks, or visitors who skip a few weeks.

The difference in number of sessions and number of page requests per session between both groups is analyzed with General Linear Model Repeated Measurement (GLM RM). The GLM RM procedure provides analysis of variance when the same measurement is made several times on each subject. Using this general linear model procedure, it is possible to analyze the effects of both the between-subjects factors (visitors or customers) and the within-subjects factors (online activity per week, e.g. number of sessions).

Fig. 5.2.1.1 Number of sessions of visitors and customers during the first 8 weeks
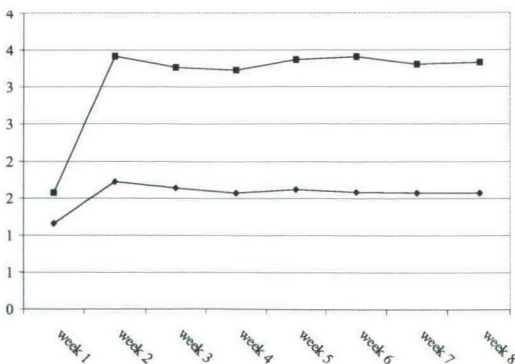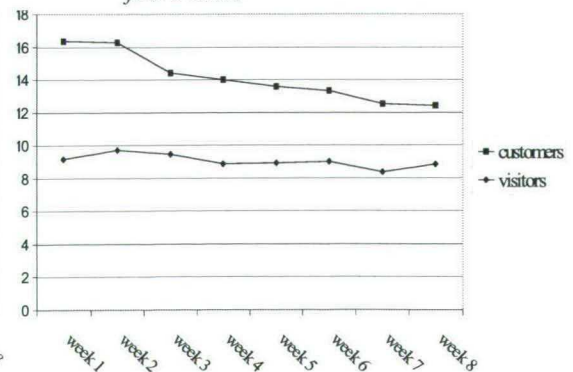
Fig. 5.2.1.2 Number of page requests per session of visitors and customers during the first 8 weeks

There is a clear distinction in online behaviour between visitors and customers during the first eight weeks on SO. The differences in number of sessions ($F = 10.66$ and $p < 0.001$) and the number of page requests ($F = 3,938.63$ and $p < 0.001$) appear to be significant. There is also a significant interaction-effect of 'type of user (visitor or customer)' and 'time (week)' for number of sessions ($F = 2.82$ and $p = 0.006$) and number of page requests per session ($F = 274.04$ and $p < 0.001$). This means that visitors and customers differ in online development during their first weeks on SO. The new user who opens a personal account for ordering stocks has more sessions per week and has more page requests per session during the first eight weeks than a visitor who does not become a registered customer. The latter may or may not come back during the weeks following their first visit on SO.

There were four typologies of sessions, A, B, C and D found. In what way the typologies of sessions develop over time? Figure 5.2.1.3 shows the typologies of sessions of *visitors* during the first eight weeks on SO. Figure 5.2.1.4 shows the typologies of sessions of *customers* during the first eight weeks on SO. Two frequent combinations of typologies, BC and AB, are also shown.

Fig. 5.2.1.3 typologies of sessions of visitors   *Fig. 5.2.1.4   typologies of sessions of customers*
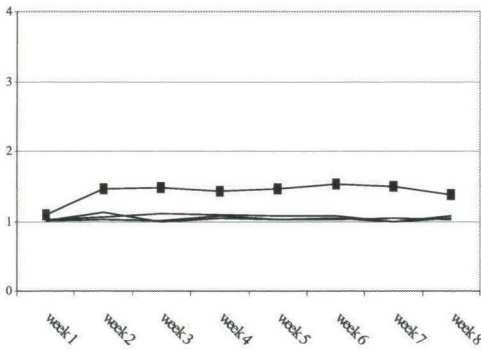*during the first 8 weeks*   *during the first 8 weeks*
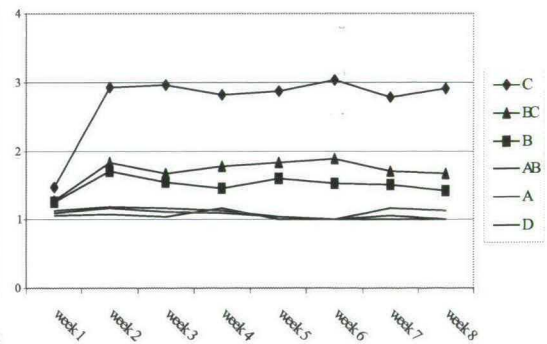
In respect of type of use, registered customers differ from visitors during the first weeks. Customers show a noticeable increase of stock exchanges during their first weeks. The customer, who follows this activity pattern, might turn into a loyal customer after a while. From other analyses, it appears that, particularly during the first week, visitors open a personal account on SO and become a customer. For all typologies, SO must create

corresponding entries in the navigation menu on the home page. SO must also create a welcome entry for starting users on the homepage.

Modelling customer development on SO

In this section, modelling customer online development on SO is described. Logistic regression analysis (forward stepwise, conditional) is used to estimate the linear relationship between a dependent variable (active customer or not) and one or more independent variables or covariates (online development during the first weeks). Logistic regression is suited for models where the dependent variable is dichotomous (active customer or not). Logistic regression coefficients can be used to estimate odds ratios for each of the independent variables in the model.

Thus, based on a customer's online behaviour during their first weeks on SO, we try to predict who becomes an active customer and who not. The definition of the dependent variable (active customer or not) must be determined. From figure 5.2.1.1 appeared that customers have at least three sessions per week. Then, the quotient of the 'total number of sessions' divided by the 'number of weeks with online activity' during the period of analysis per customer is calculated. This is the ratio (r_ac) which indicates the online activity per unit of time of the customer.

$$r\_ac = \frac{\text{number of sessions}}{\text{number of weeks online activity}}$$

The average ratio (r_ac) is about 2.00. The definition of an 'active customer' is someone with 3 or more sessions during week 6, 7 and 8, and with a *r_ac* -value of at least 2.00 for five or more weeks.

With clickstream analyzes it is possible to analyze a customer's surfing behaviour during the first weeks (see figure 5.2.1.4). In the logistic regression analysis, the independent variables are a variety of characteristics, such as surfing behaviour during the first five weeks on SO. Table 5.2.1 shows the regression coefficients, in which typologies of sessions are the independent variables.

Table 5.2.1   *Regression coefficients* of typologies of sessions*

	B	S.E.	Sign.	Exp(B)**
week05_ABC	0.96	0.19	0.00	2.62
week 04_AC	0.91	0.31	0.00	2.48
week 05_BC	0.51	0.10	0.00	1.67
week 05_C	0.44	0.06	0.00	1.55
week 04_ABC	0.43	0.21	0.03	1.54
week 03_BC	0.38	0.12	0.00	1.46
week 04_C	0.25	0.06	0.00	1.28
week 02_ABC	0.10	0.21	0.00	0.61
week 01_A	0.09	0.42	0.00	0.43
week 01_ABC	0.09	0.23	0.00	0.43
week 02_BC	0.05	0.12	0.00	0.39

*   *dependent variable is 'active customer'*
**   *Exp(B) is the value by which the odds of the event change when the independent variable increases by one unit. If the value is greater than 1, the odds are increased.*

It appears that type of surfing behaviour, especially trading stocks (typology C), had a relevant contribution in predicting who would become an active customer. A visitor, who subscribes himself as a registered customer and start trading stocks in the first weeks, has the highest probability of becoming an active customer on SO.

Not all dependent variables were significant. The estimated proportion of variance (Nagelkerke[1] R-square) in this model is 0.41 (on a scale from 0 to 1). Apparently other types of personal characteristics, for example 'income' or 'education', also play a relevant role.

5.2.2   Customer retention on SO

The Internet generates a lot of traffic, which means that many people visit the concerning website. However, many of them are not interested, leave the website and will never return. Before they leave, marketers want to persuade the visitor to stay and to become a customer. Is it possible to detect a change in online behaviour that directly results in an inactivity of customers? With clickstream analysis it is possible to conduct longitudinal research in order to detect inactivity of a customer. Figure 5.2.2.1 shows the average number of sessions per week of *visitors* and *customers* during the last four weeks on SO. In figure 5.2.2.2 the average

---

[1]   The Nagelkerke R-square is a generalized coefficient of determination, used to estimate the proportion of variance in the dependent variable, which is explained by the predictor (independent) variables. The Nagelkerke R-square has a scale, which covers the full range from 0 to 1.

number of page requests per session of *visitors* and *customers* in the last four weeks is shown. Week -1 means the last week on SO. The difference in number of sessions and number of page requests per session between both groups is analyzed with GLM RM.

Fig. 5.2.2.1 Number of sessions of visitors and   *Fig. 5.2.2.2   Number of page requests per*
customers during the last 4 weeks   *session of visitors and customers*
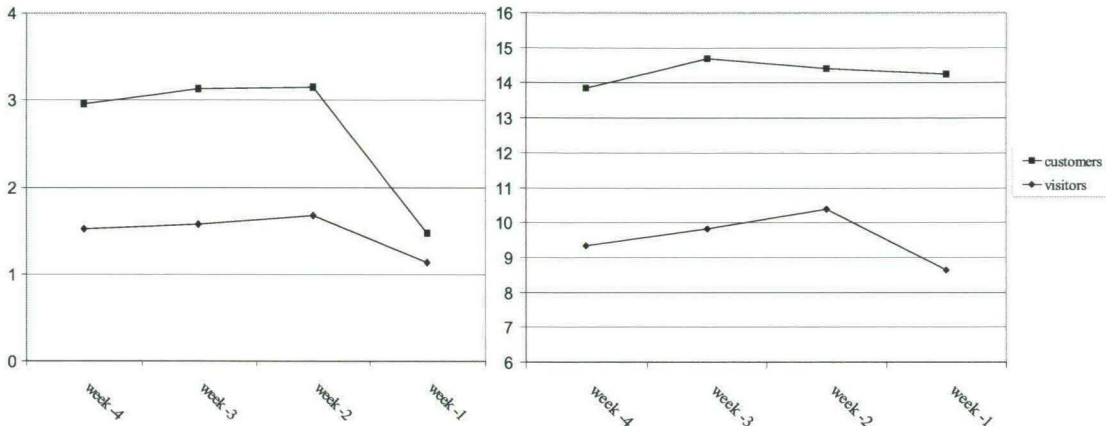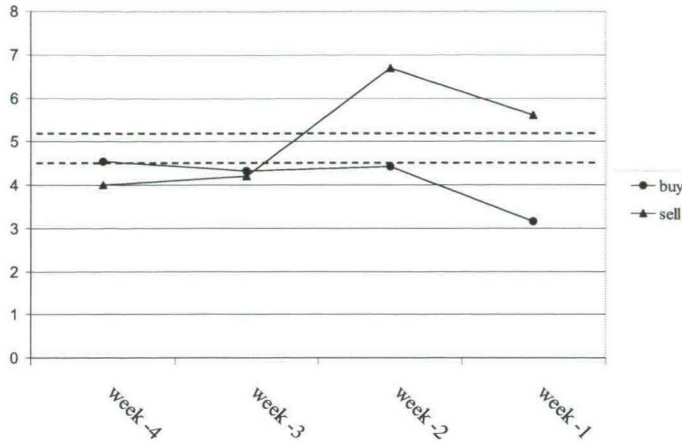*during the last 4 weeks*

Figure 5.2.2.1 and figure 5.2.2.2 show there is a clear distinction in online behaviour between visitors and customers during the last four weeks on SO. The differences in number of sessions ($F = 42.94$ and $p < 0.001$) and the number of page requests ($F = 32.078$ and $p < 0.001$) is significant. There is *no* significant interaction-effect of 'type of user (visitor or customer)' and 'time (week)' for number of sessions and number of page requests per session. This means that it is very difficult to detect a change in online behaviour during the last weeks on SO for visitors and customers. This results in no possibilities of modelling customer online retention.

The number of sessions for customers stays relatively stable, but it drops suddenly during the last week. Is the decline of a customer's activity also visible in the number of stock exchanges during the last four weeks? Figure 5.2.2.3 shows the number of stock exchanges, bought and sold, during the last four weeks. The average number of stocks *bought* is 4.6 and the average number of stocks *sold* is 5.1 (represented by the dashed lines in figure 5.2.2.3).

Figure 5.2.2.3   Number of stock exchanges per *customer* during the last
                  four weeks on SO

During the last weeks, the number of stock acquisitions per customer decreases. Moreover, the number of stock sales increases during the last two weeks. Apparently, a customer sells all his or her stocks before he or she becomes inactive. If the number of stock acquisitions and stock sales diverges below the average number, this should be viewed as a tell-tale sign of imminent leaving of the customer. In order to detect the negative change in online behaviour of potential leaves, SO should implement an 'early warning system'. All customers with abnormal activity should be contacted and questioned about their dissatisfaction. E-marketers may come up with interventions to change this adverse behaviour and to reverse the process of attrition, for example, by offering a discount on the commission of the next ten stock exchanges.

5.3   Discussion of findings

This study showed that with the help of clickstream data it is relatively easy to identify potentially active visitors during the first weeks on the website. However, it is difficult to predict the moment that a customer stops visiting the website and runs away. Further research could determine the effect of marketing interactions on customer online development and retention. Also, off-line characteristics, like stock value, expiration date, and received dividend, may play a role in customer behaviour on a web-banking site.

5.4   Some conclusions

Visitors and customers differ in online development over time. Banks must be able to discover and target prospects at an early stage. Banks should also implement an 'early

warning system' to detect a negative change in the online behaviour of potential run-aways before it is too late. At the very least, all customers with below average activity should be contacted. E-marketers must then attempt to develop methods to reverse this trend. To ensure profitability in the long-run, online customer retention is vital (Wiegran & Koth, 1999). If banks wish to enhance customer retention, they must lock customers into a process that is not easily duplicated, replicated and when performed well, not easily abandoned (Nemzow, 1999). Many sites are successful in luring visitors, but not in getting these visitors to buy or at turning occasional buyers into frequent ones (Agrawal et al., 2001). Building a profitable website that retains customers is a lot more complicated than designing nice web pages and waiting for the revenue to roll in (Wiegran & Koth, 1999).

It is difficult for financial institutions to implement Internet banking in their marketing activities, because most of them have no clear strategy for creating and maintaining relationships with customers (Van Meer, 2006a). A customer's financial life cycle reflects the fact that each customer's financial needs change over time. Banks should align their business models with customers' financial needs, and offer an array of attractive services to satisfy every phase of their life cycles.

However, is it possible to direct customers' online behaviour by marketing interactions? Perhaps direct-marketing techniques are better suited to one-off transactions rather than initiating a longer-term relationship where referrals from trusted third parties are more important. The interactive format of Internet banking could help to create and improve customer relationships by identifying cross-sell and up-sell opportunities. In order to get closer to the customer, banks and other financial institutions must try to create a one-to-one relationship with them. Clickstream analysis is a feasible methodology to support a customer-contact strategy (Van Meer & Van Raaij, 2004). Collecting clickstream data makes it possible to analyze customer online behaviour and to retain profitable customers by predicting activity throughout their life cycles. Anything that can be digitized can be customized, and in time, large service providers will have to develop personal relationships with individuals (Pine et al., 1995).

Chapter 6   Market research on customer satisfaction, loyalty and profitability on a web-banking site

Abstract

Customers with a long-lasting relationship are in general satisfied and loyal customers. However, not every customer is loyal and/or profitable. This is probably more true on the Internet, where the opportunities for customer loss may occur at any second. A real-world application of customer loyalty to a web-banking site is reported. A survey was conducted in order to find a relationship between customer behaviour, satisfaction, loyalty and profitability on a web-banking site of a financial institution in The Netherlands. To ensure the outcomes are valid and accurate, the results - using structural equation modelling - were confirmed. In order to increase profitability of a web-banking site, financial services providers should focus on identifying satisfied customers and turn them into advocates.

6.1   Introduction

In the financial services sector it is well known that customers with a long-lasting relationship are in general satisfied customers. Establishment of stable relationships is becoming a key target of marketing efforts. However, not every customer is loyal or profitable. Customer loyalty describes the tendency of a customer to choose one business or one product over another for a particular need (East et al, 2000). A customer may demonstrate their loyalty in several ways: They may choose to stay with a firm, whether this continuation is defined as a relationship or not; they may increase the number of purchases; or they may do both (Reinartz & Kumar, 2002; Rowley & Dawes, 2000). Relationship marketing suggests that a customer's level of satisfaction with the service provider substantially affects his or her loyalty to the company. Many studies reinforce this notion that customer satisfaction leads to greater customer loyalty (Anderson and Sullivan, 1993; Bolton and Drew, 1991; Bearden and Teel, 1983), which in turn has a positive impact on profitability (Homburg et al, 2005; Reichheld & Teal, 1996). The development of loyalty is the result of well-managed customer retention programs. Customers who are targeted by a retention program demonstrate higher loyalty to a business after a certain period of time.

There are different types of customer loyalty, for example, brand loyalty and product loyalty. In chapter 2 the concept of customer loyalty (see also § 2.5) was described in detail. Customer loyalty is the final stage in the customer life cycle (CLC) model.

In this study, the author is particularly interested in customer loyalty relating to a web-banking site. To create web loyalty is to assume that every Internet customer is constantly at risk of defection and act accordingly (Griffin, 2002). Normally, customers are highly loyal with their financial services providers. This is might be not true on the Internet, where the opportunities for customer loss may occur at any second. The fact is, e-commerce has trained customers in how to be less loyal because of easy entry, easy exit, higher expectations and competitive pricing. Although banks have introduced Internet banking for several reasons, for example cost reduction, they also take the risk of losing customers and revenue.

In this chapter, a real-world application will be reported on customer loyalty to a web-banking site of a financial institution in The Netherlands.

6.2 Empirical study: Customer satisfaction, loyalty and profitability on 'Finances Online'

The website involved is a web-banking site that will be called for purposes of discussion, 'Finances Online (FO)'. FO is a website where customers open a personal account and do al their banking activities, such as administering savings accounts and trading stocks. The web-banking site of FO was launched in February 2004 and in November 2004 it had about 1.1 million users. The popularity of this website caused an increase in the number of visitors, but FO was uncertain about the loyalty and profitability of the customers. The issue in question for FO was what the relation is between:

- customer activity on the web-banking site
- customer satisfaction with the web-banking site
- customer loyalty to the web-banking site
- customer profitability on the web-banking site

6.3 Conceptual model

In order to shed some light on these issues, FO conducted a survey among customers in November 2004. The data from the survey was used to find answers to three research questions:
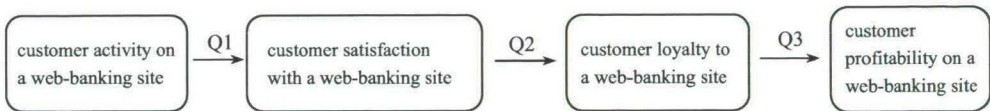
Q1 Is online activity on the web-banking site correlated with satisfaction with the web-banking site?

Q2 Is satisfaction with the web-banking site correlated with loyalty to the web-banking site?

Q3 Is loyalty to the web-banking site correlated with customer profitability on the web-banking site?

Based on the three questions the proposed research model is presented (see figure 6.3).

Figure 6.3 research model

The ultimate goal is to link satisfaction, loyalty and profitability, in order to measure the impact of consumer attitude towards Internet banking on the business.

6.4 Questionnaire

The research was conducted by a Dutch market research firm. With a hyperlink and a password, the respondents were invited via e-mail to complete the web-based questionnaire. In this questionnaire, users of tae web-banking site were asked to comment on several aspects of the website and themselves, for example:

- Personal data: gender, age, experience with the web-banking site (EWB), online activity on the web-banking site (OAS).
- Attitude towards the web-banking site: Customer satisfaction with the web-banking site (CSWB) was measured on a scale from 1 (low) to 10 (high).

There were also two questions measuring the intention of customers:

- Customer intention to keep using the web-banking site in the near future, and
- Customer willingness to recommend the web-banking site to others.

Both responses were measured on a scale from 1 (most uncertainly) to 4 (most certainly).

Customer characteristics from the marketing database were linked to the survey data. We were particularly interested in the following characteristics:

- Online transactions from the marketing database (OAM). The number of transactions was classified in five categories, varying from a low of six transactions per month to thirty transactions and more.

♦ Customer profitability as a total of gross profitability minus costs (e.g. transaction costs) in terms of Euros.

The respondents were members of a Dutch online research community. There were 684 users of the web-banking site of FO, 18 years and older, who said FO was their most important home bank. The dataset was weighted afterwards in order to correct the answers to become representative for all customers of FO.

6.5 Results

The results from the analyses of each question are described below. Based on the outcomes the conceptual model was validated.

6.5.1 Is online activity on the web-banking site correlated with satisfaction with the web-banking site?

First, the difference in customer financial activity between a customer who has access to a web-banking application and a customer who does not, were examined. An Independent-Samples T-Test procedure, which compares means for two groups of cases, was used. Table 6.5.1.1 shows the differences in transactions between customers who have access to the web-banking site and customers who do not. Off-line transactions are synonymous with payment cheques.

Table 6.5.1.1   Transactions between customers who have access to the web-banking site and customers who do not

	access	N	Mean
total number of customer transactions	no	837	16.33
	yes	617	36.03
total number of customer off-line transactions	no	837	6.63
	yes	617	2.53

remark: offline transactions are synonymous with payment cheques

Customers with access to the web-banking site of FO are in general more financially active (T-value = 21.56; α = 0.05) and have less off-line transactions (T-value = 8.61; α = 0.05) than customers without access.

The majority of the research literature in this area strongly suggested that computer experience is positively correlated with computer attitude (Loyd & Gressard, 1984; Koohnag,

1986; Bracey, 1988; Martin, 1991; Proctor & Burnett, 1996). Regarding online activity, there are three types/levels of data about customer activity with the web-banking site of FO:

- Online transactions from the marketing database (OAM).
- Customers' self-reported online activity (OAS) from the survey. The scores vary from daily use, to two or three sessions a week, to once per three months, to never.
- Customers' self-reported experience with the web-banking site (EWB) from the survey. The scores vary from less than six months to more than five years.

There is a significant positive correlation (Pearson's r = 0.25) between a customer's self-reported online activity (OAS) and online transactions from the marketing database (OAM). This coefficient illustrates that what people think or say and what people actual do might differ.

There is only a significant positive correlation (Pearson's r = 0.12) between experience with the web-banking site and (EWB) and self-reported online activity (OAS).

Construction of customer satisfaction with the web-banking site

Customer Satisfaction with the Web-Banking site (CSWB) was measured on a scale from 1 (low) to 10 (high). The frequency (table 6.5.1.2) of CSWB is shown below.

Table 6.5.1.2   Customer Satisfaction with the Web-Banking site (CSWB)

satisfaction score (CSWB)	frequency	percentage	cum. percentage
3	5	0.7	0.7
4	7	1.0	1.8
5	18	2.6	4.4
6	65	9.5	13.9
7	269	39.3	53.2
8	249	36.4	89.6
9	60	8.8	98.4
10	11	1.6	100
Total	684	100	

According to the expectations most respondents scored the web-banking site of FO a 7 (39% of respondents) or 8 (36%). Is it possible to construct an alternative measurement of customer satisfaction with a higher variability of scores in the frequency distribution? There were also six items of appreciation of the site that might influence customer satisfaction with the Web-Banking site: Log on procedure (CALWB), topicality (CATWB), surveyability (CASWB), ease of use (CAEWB), functionality (CAFWB) and personalization (CAPWB) of the Web-Banking site. These six items were measured on a five points-scale from 1 (poor) to 5

(excellent). A Principal component analysis (PCA) on these six aspects was conducted. PCA attempts to reduce data in order to identify a small number of factors that explain most of the variance observed in a much larger number of variables. We used PCA to reduce the six items of appreciation into *one* factor (regardless of the eigenvalues[2]). For each customer, one 'factor score' is calculated. Table 6.5.1.3 shows the variance explained by the first component.

Table 6.5.1.3   Principal component analysis and explained variance on components

| component | Initial eigenvalues | | |
	total	% of variance	cum % of variance
1	3.07	51.23	51.23
2	0.79	13.21	64.44
3	0.68	11.41	75.85
4	0.66	10.96	86.82
5	0.49	8.16	94.98
6	0.30	5.02	100

extraction method: CATPCA

The cumulative amount of observed variance explained by adding the first component to the model is 51%. The table below shows the score of each aspect on the first component or factor.

Table 6.5.1.4   Principal component analysis and factor loadings on first component

	factor loading component 1
log on procedure (CALWB)	0.66
topicality / news (CATWB)	0.55
surveyability (CASWB)	0.81
ease of use (CAEWB)	0.81
functionality (CAFWB)	0.76
personalization (CAPWB)	0.67

extraction method: CATPCA

This factor or component is an alternative score of customer satisfaction with the web-banking site: aCSWB. There is a significant positive correlation (Spearman's rho = 0.64) between CSWB and aCSWB.

---

[2]   By default, factors with eigenvalues greater than 1 (when analyzing a correlation matrix) or the average item variance (when analyzing a covariance matrix) are extracted. To use a different eigenvalue as the cut off value for factor extraction, enter a number between 0 and the total number of variables in the analysis.

In addition, a significant relationship between customer satisfaction with the bank in general, and CSWB (Spearman's rho = .54) and aCSWB (Spearman's rho = .55) was found.

Online transactions and satisfaction with the web-banking site

Is there a relationship between the number of online transactions (OAM) and customer satisfaction with the web-banking site of FO? In order to answer this question a variance analysis was conducted to find out which portion of the variation of customer satisfaction with the web-banking site (CSWB) is attributed by the number of online transactions (OAM). Table 6.5.1.5 shows the results:

Table 6.5.1.5   *Variance analyses (GLM Univariate) to estimate which proportion of variance in 'customer satisfaction with the web-banking site (CSWB)' is attributed by 'online transactions (OAM)'*

dependent variable: CSWB					
	Type III Sum of squares	df	Mean squares	F	Sig.
corrected model[a]	4.61	4	1.15	1.06	.38
intercept	33,739.84	1	33,739.84	31,015.78	.00
OAM	4.61	4	1.15	1.06	.38
error	666.84	613	1.09		
total	34,451.00	618			
corrected total	671.45	617			

[a] R-square = 0.007 (adjusted R-square = 0.00)

There is no significant relationship between OAM and CSWB. There is also no significant relationship between OAM and aCSWB (R-square = 0.071; p = 0.053).

Self-reported online activity and satisfaction with the web-banking site

A variance analysis was conducted to find out if customers' self-reported online activity (OAS) is related to customer satisfaction with the web-banking site of FO. Table 6.5.1.6 shows the results.

Table 6.5.1.6   Variance analyses (GLM Univariate) to estimate which proportion of variance in 'customer satisfaction with the web-banking site (CSWB)' is attributed by self-reported activity (OAS)

dependent variable: CSWB

	Type III Sum of squares	df	Mean squares	F	Sig.
corrected model[a]	10.28	1	10.28	9.57	0.002
intercept	546.94	1	546.94	508.86	0.000
OAS	10.28	1	10.28	9.57	0.002
error	661.01	615	1.07		
total	34,402.00	615			
corrected total	671.30	615			

[a] R-square = 0,015 (adjusted R-square = 0,014)

Although the explained variance is relatively low, a significant positive relationship between customers' online activity (OAS) and customer satisfaction with the web-banking application (CSWB) was found. It also appeared that there is a significant positive relationship between OAS and aCSWB (R-square = 0.031; p = 0.000).

Thus, regarding the first research question (see section 6.3), self-reported or perceived activity on the web-banking site is positively correlated with satisfaction with the web-banking site. McMillan (2000) also found that perceived interactivity explains a large portion of the variance in the Attitude toward the Website.

6.5.2   Is satisfaction with the web-banking site correlated with loyalty to the web-banking site?

In order to test the conceptual model, the author tried to create a measurement for customer loyalty to a web-banking site (CLWB). In order to determine the concept of CLWB, two items from the questionnaire were chosen:

1) The intention to keep using the web-banking site of FO in the near future, was measured on a four points-scale from 1 as most uncertainly, to 4 as most certainly

2) The willingness to recommend the web-banking site of FO to others was also measured on a four point-scale from 1 as most uncertainly to 4 as most certainly. Reichheld (2003) reported that the willingness to recommend a product or a service to someone else can serve as a useful determinant of customer loyalty. Loyalty is the willingness of someone – a customer, an employee, a friend – to make an investment or personal sacrifice in order to strengthen a relationship. When customers act as references, they do more than indicate that they have received good value from the company, they also put their own reputations on the line (Reichheld, 2003).

We tried to conduct a principal component analysis on these two aspects in order to construct one factor for the above items. Table 6.5.2.1 shows the variance explained by each component.

Table 6.5.2.1   *Principal component analysis and explained variance on components*

	Initial eigenvalues		
component	*total*	*% of variance*	*cum % of variance*
1	1.12	55.75	55.75
2	0.88	44.25	100.00

extraction method: CATPCA

The difference between the eigenvalues is relatively small. This implies that it is difficult to use one component (or factor). However, the conceptual model (see section 6.3) requires one factor for customer loyalty to a web-banking site (CLWB) of FO. The first component, with a cumulative variance of almost 56%, reflects the CLWB. The scores of CLWB are varied from 1, as 'truly loyal,' to 8, as 'ready to defect. Furthermore, the two single items are also used in the next analyses to find a relationship with satisfaction with the we-banking site.

Customer satisfaction is considered a conditional factor for customer loyalty. At the end of the customer life cycle, customers should turn out to be satisfied with the product or service and loyal to their bank. Is there a relationship between customer satisfaction with the web-banking site and customer loyalty to the web-banking site? A variance analysis was conducted to examine the relationship between customer satisfaction with the web-banking site (CSWB) and customer loyalty to the site (CLWB). Table 6.5.2.2 shows the results:

Table 6.5.2.2   *Variance analyses (GLM Univariate) to estimate which proportion of variance in 'customer loyalty to a web-banking site (CLWB)' is explained by 'customer satisfaction with the web-banking application (CSWB)'*

dependent variable: CLWB					
	Type III Sum of squares	df	Mean squares	F	Sig.
corrected model[a]	136.50	7	19.50	24.78	0.00
intercept	20.43	1	20.43	25.95	0.00
CSWB	136.50	7	19.50	24.78	0.00
error	478.50	608	.79		
total	615.00	616			
corrected total	615.00	615			

[a] R-square = 0.22 (adjusted R-square = 0.21)

There is a significant positive relationship between customer satisfaction with the web-banking site (CSWB) and customer loyalty to the web-banking site (CLWB). There is also a significant positive relationship between aCSWB and CLWB (R-square = 0.15; p = 0.00). Thus, regarding the second research question (see section 6.3), customer satisfaction with the web-banking site is correlated with loyalty to the web-banking site. The development of loyalty involves building and sustaining a relationship with satisfied customers.

It appears that there is also a very strong relationship between customer satisfaction with the web-banking site of FO (CSWB) and the willingness of customers to recommend the web-banking site to someone else (R-square = 0.40; p = 0.00). There is also a relationship between customer satisfaction with the web-banking site of FO (aCSWB) and the intention to keep using the web-banking site in the near future (R-square = 0.010; p = 0.046), but with a relatively low explained variance this seems rather unimportant.

6.5.3   *Is loyalty to the web-banking site correlated with customer profitability on the web-banking site?*

According to Buchanan and Gilles (1990), increased customer profitability occurs because:

-   The fundamental assumption of loyalty models is that keeping existing customers is less expensive than acquiring new ones.
-   In fact, not all long-term relationships are profitable. Instead of focusing on retention, it makes more sense to focus on loyalty and improving the customer relationship with cross-sell and deep-sell methods. If a positive attitude (= loyalty) towards a service provider is created, customers are probably more eager to buy.
-   Long-term customers may initiate free word of mouth promotions and referrals.

Construction of customer profitability on the web-banking site

Three steps are followed to define the proportional contribution of Internet banking to the total customer profitability:

Step 1:   Predict customer profitability of those who did *not* have access to the web-banking application. A linear regression analysis was conducted to find out which customer characteristics of October 2004 played a relevant role in predicting customer profitability (cust_prof) for November 2004. Several customer characteristics were selected from the marketing database, such as gender, age, duration of relationship, total number of products

and transactions, deposits, savings and customer profitability. Table 6.5.3.1 shows the significant regression coefficients of the regression model.

Table 6.5.3.1   *Regression analyses (optimal scaling) to predict cust_prof November 2004 with customer characteristics of October 2004*

dependent variable: cust_prof November 2004				
customer characteristics	*standardized coefficients*		*F*	*Sig.*
of October 2004	*Beta*	*Std. Error*		
cust_prof	.97	.00	86,973.15	.00
age	.016	.00	30.91	.00
deposits	.011	.00	9.30	.002

About 97% of the variation in cust_prof in November 2004 is attributed by 'cust_prof, age' and 'deposits' of October 2004. Customer profitability from the past appeared to be by far the best predictor of future customer profitability.

Step 2:   Estimate customer profitability (cust_prof). Based on the outcomes from step 1 were able to estimate cust_prof with the following formula:

$$cust\_prof(t2) \approx ,978 \times cust\_prof(t1) \; + \; 0,016 \times age(t1) \; + \; 0,011 \times deposits(t1)$$

Step 3:   Calculate the difference between *estimated* cust_prof and the *observed* cust_prof. Based on this model, it is possible to calculate the difference between *estimated* cust_prof and the *observed* cust_prof for all customers with access to the web-banking site of FO. This is the proportion of Internet banking on total customer profit, henceforth 'propib_prof'. In table 6.5.3.2 the average propib_prof of FO in November 2004 is shown.

Table 6.5.3.2   *Averages of customer profitability of FO in October and November 2004*

	N	*Mean*
cust_prof October 2004	616	122.66
cust_prof November 2004	616	138.44
pred_prof November 2004	617	126.10
propib_prof November 2004	616	12.34

The average proportional contribution of the web-banking site of FO to the average customer profitability is EUR 12,34. Propib_prof is an approximation for statistical purposes.

Regarding Q3 of the proposed model (see figure 6.3) there is a relationship between customer loyalty to FO and the proportion of Internet banking on total customer profitability (propib_prof). Therefore, a variance analysis is conducted to find out the relationship between customer loyalty to a web-banking site (CLWB) and the proportion of Internet banking on total customer profitability (propib_prof). The table below shows the results:

Table 6.5.3.3   *Variance analyses (GLM Univariate) to estimate which proportion of variance in 'the proportion of Internet banking on total customer profitability (propib_prof)' is attributed by 'customer loyalty to a web-banking site (CLWB)'*

dependent variable: propib_prof					
	Type III Sum of squares	df	Mean squares	F	Sig.
corrected model[a]	13,796.28	1	13,796.28	.47	.49
intercept	99,898.04	1	99,898.04	3.38	.067
CLWB	13,796.28	1	13,796.28	.47	.49
error	18,128,685.13	613	29,573.71		
total	18,242,404.59	615			
corrected total	18,142,481.41	614			

[a] R-square = 0,001 (adjusted R-square = 0,001)

There is no relationship between customer loyalty with the web-banking site (CLWB) and the proportion of Internet banking on total customer profitability (propib_prof).

Although the explained variance is relatively low, it appeared that there is a significant relationship between customers' willingness to recommend the web-banking site to someone else and the proportion of Internet banking on total customer profitability (R-square = 0.026; p = 0.003). This is not a strong relationship, however it offers a possibility for a further analysis to the relationship with customer online value. Table 6.5.3.4 shows on each level of recommendation the average proportion of Internet banking on total customer profitability (propib_prof).

Table 6.5.3.4   *Averages of propib_prof on four levels of willingness to recommend the   web-banking site to others*

|		N	(%)	mean propib_prof
recommend web-banking site to others	most uncertainly	18	2.9	-0.44
	uncertainly	68	11.0	3.69
	certainly	261	42.3	10.76
	most certainly	270	43.8	17.87

The more a customer has the intention to recommend the web-banking site to others the higher the proportion of Internet banking on total customer profitability (propib_prof). The most basic surveys – employing the right questions – may allow companies to report timely data that are easy to act on (Reichheld, 2003).

6.6   Causal model

In section 6.3 the conceptual model was introduced. Subsequently several univariate relationships (ANOVA) were analysed. In this section the conceptual model is tested and validated (with AMOS). The reason to test a conceptual model is to ensure the outcomes of the analyses are valid and accurate. When the variables in the model are manifest variables, path analysis is applied. A path model is a diagram relating independent, intermediary, and dependent variables (Cohen et al., 2003). The path coefficients (beta) in the model are used to assess the relative importance of various direct and indirect causal paths to the dependent variable. Path analysis is particularly sensitive to model specification because failure to include (ir)relevant causal variables often substantially affects the path coefficients. Such interpretations should be undertaken in the context of comparing alternative models, after assessing their goodness of fit. The best-fitting of two or more models is selected as the best model for advancement of theory.

There are only observed (manifest) variables, and the following variables were in the model: 'OAS', 'CSWB', 'CLWB' and 'propib_prof' (see also section 6.3). Figure 6.6.1 shows the path diagram of the estimated model 1 (with standardized path coefficients).

Figure 6.6.1   Estimated model 1
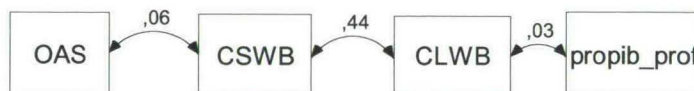
AMOS provides a series of indices that can be utilised to access whether or not the data conform to the hypothesised model. Most fit indices can be divided into three categories: (1) absolute fit, (2) incremental fit and indices of (3) model parsimony (Holmes-Smith, 2000). The model chi-square statistic and the normed fit index (NFI) fall into the first category. Both indices shows goodness of fit based on the covariances of the implied model and the covariances of the observed or independent model. The Tucker-Lewis index (TLI) is an incremental fit index. This index measures the difference between the proposed model and a baseline model where no relations between the hypothesised variables exist. Model parsimony

refers to how likely can a model be generalised to the population (Holmes-Smith, 2000). The root mean square error of approximation (RMSEA) estimates lack of fit compared to the saturated model (Browne & Cudeck, 1989). Table 6.6.1 shows the fit measures of the estimated model 1.

Table 6.6.1   *Fit measures of estimated model 1*

fit measures	estimated model	fit measures	estimated model
Chi-square	12.85	Normed fit index NFI	0.99
Degrees of freedom	3	Tucker-Lewis index TLI	0.99
Probability level	0.005	RMSEA	0.050

The fit indices reveal that model 1 is relatively inaccurate: the p-value is less than 0.05. Other indices show acceptable values - the Tucker-Lewis index (TLI) and the normed fit index (NFI) exceed the 0.9 and the root means square error (RMSEA) is less than 0.05 - to continue with testing and improving the model. Perhaps the missing link between CLWB and propib_prof causes an inadequate fit of the model.

The following outcomes of the three research questions were found (see also section 6.5):
-    There is a relationship between experience with the web-banking site (EWB) and self-reported online activity (OAS);
-    There is a relationship between self-reported online activity (OAS) and satisfaction with the web-banking site (CSWB), and with loyalty to the web-banking site (CLWB);
-    There is a relationship between satisfaction with (CSWB) and loyalty to the web-banking site (CLWB); and
-    There is a relationship between customer's willingness to recommend the web-banking site (recommend) and the proportion of Internet banking on total customer profitability (propib_prof).

Based on the outcomes of the research questions, the conceptual model is validated (see figure 6.6.2). The following variables were in the model: 'EWB', 'OAS', 'CSWB', 'CLWB', 'recommend' and 'propib_prof'. Figure 6.6.2 shows the path diagram of the estimated model 2 (with standardized path coefficients).
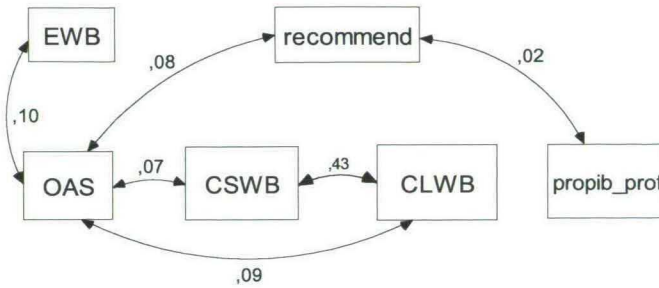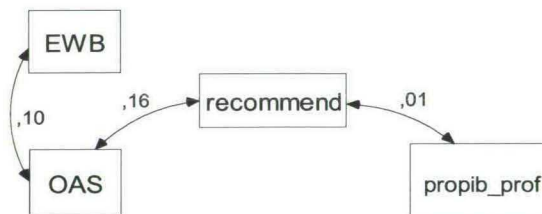
Figure 6.6.2   Estimated model 2

Table 6.6.2 shows a few fit measures of the estimated model 2.

Table 6.6.2   Fit measures of estimated model 2

fit measures	estimated model	fit measures	estimated model
Chi-square	402.65	Normed fit index NFI	0.92
Degrees of freedom	9	Tucker-Lewis index TLI	0.83
Probability level	0.00	RMSEA	0.34

The fit indices reveal that model 2 is also inaccurate: the p-value is less than 0.05 the TLI is less than 0.9 and the RMSEA exceeds 0.05. Models are penalized for each parameter, and perhaps too many parameters are included in model 2.

In order to find a better suited model, only the following variables were included in the estimated model: 'EWB', 'OAS', 'recommend' and 'propib_prof'. Figure 6.6.3 shows the path diagram of the estimated model 3 (with standardized path coefficients).

Figure 6.6.3   Estimated model 3

Table 6.6.3 shows a few fit measures of estimated 3.

Table 6.6.3   Fit measures of estimated model 3

fit measures	estimated model	fit measures	estimated model
Chi-square	4.82	Normed fit index NFI	0.99
Degrees of freedom	3	Tucker-Lewis index TLI	0.99
Probability level	0.19	RMSEA	0.040

These fit indices indicate that the reduced model is relatively accurate: the p-value exceeds 0.05; the RMSEA is less than 0.05 and also the NFI and TLI values are close to 1. However, the beta-coefficient between 'recommend' and 'propib_prof' is low (0.01).

In short, it proved not to be successful in fitting the data to a model. Model 1 and 2 show bad fit indices and could be improved substantially. Model 3 is preferred because the model shows an adequate fit and 'propib_prof' is included in the model (although the path coefficient (beta) between 'recommend' and 'propib_prof' is low.

6.7   Discussion of the findings

During the analyses a few problems had to be solved. The first problem was the low variance of the item 'customer satisfaction with the web-banking site (CSWB)'. Most respondents scored the web-banking site a 7 (39%) or 8 (36%). By recording the evaluations of six aspects of the site (log on, actuality, surveyability, easiness of use, functionality and personalisation), an alternative score of satisfaction with the web-banking site (aCSWB) was calculated. Unfortunately, none of these categories scored significantly higher in this round of research; in some cases CSWB was better, and in some cases aCSWB. The next problem was the operationalization of the concept of customer loyalty to a web-banking site (CLWB). Two items from the questionnaire were chosen: (1) the intention to stay with the web-banking site in the near future, and (2) the willingness to recommend the web-banking site to others, to create the variable 'customer loyalty to a web-banking site (CLWB)'.

Three hypotheses were tested. The first hypothesis (Q1) assumed that there is a relationship between customer online banking activity and customer satisfaction. A significant relationship between a customer's self-reported online activity (OAS) and customer satisfaction with FO (CSWB) was found. Unfortunately, we did not find a relationship between the number of online transactions and customer satisfaction with the web-banking site. Thus, regarding the first research question self-reported or perceived activity on the web-banking site is correlated with satisfaction with the web-banking site.

The second hypothesis (Q2) assumed that there is a relationship between customer satisfaction with the web-banking site (CSWB) and customer loyalty to the site (CLWB). A direct correlation between these two statistics was found.

The third hypothesis (Q3) assumed a relationship between customer loyalty to the web-banking site and customer profitability. There was no relationship found between customer loyalty with FO (CLWB) and the profitable proportion of Internet banking on total customer profitability (propib_prof). The operationalization of the concept of customer loyalty to a web-banking site (CLWB) could be the problem. It was difficult to create one factor of customer loyalty to the web-banking site. Many scholars have already studied the concept of customer loyalty, however, not so many have studied the combination of customer loyalty and Internet banking. More research should be carried out to develop a domain-specific loyalty to Internet banking.

However, a significant relationship between customer's willingness to recommend FO, as a single item, and the profitable proportion of a customer's Internet banking was found. Customers who were willing to recommend the web-banking site to others also showed an increased profitability (propib_prof). In addition, those who were not willing to recommend the web-banking site to others showed low customer profitability (propib_prof). FO must consider proper actions to counteract the undesirable behaviour of this second group of customers. Perhaps are those who are willing to recommend the web-banking site others also willing to recommend all kind of products to others. More research should be carried out to test if the loyalty -construct and the recommendation is specific and unique for the web-banking site or not.

Based on the outcomes of the three research questions, the conceptual model was tested. Due to the relatively low path coefficients (beta) it proved not to be successful in fitting the data to a model. However, the author preferred the model in which a significant relationship between the willingness to recommend the web-banking site to others and customer profitability (propib_prof) is included, as it is more applicable for the marketing strategy of the bank.

6.8   Some conclusions

An experienced user of a web-banking site, who perceives him or herself as an active customer, is perhaps also satisfied with the site. However, not every satisfied customer is profitable. A marketing strategy specifically focussed on maintaining customer retention is not sufficient to create long-lasting profitable relationships. On the one hand, the author could

not prove the relationship between customer satisfaction with the web-banking site and customer profitability, on the other hand, a relationship between someone's willingness to recommend the web-banking site to others and customer profitability was found. If a customer is willing to recommend the web-banking site to others, he or she must him-/herself be satisfied with the web-banking site. Unless, those customers who are willing to recommend the web-banking site others are also willing to recommend all kind of products to others. If the customer is satisfied or not, the web-banking site is recommended to others by the customer in the end. It is nevertheless important to turn customers into advocates. In order to increase profitability, an effort should be made to identify and maintain satisfied customers who are willing to recommend the web-banking site to others (Van Meer, 2006b).

Another important marketing tactic is to monitor customer online value over time. It is possible to measure a derivate of the contribution of Internet banking to the total customer profitability. As customer financial behaviour changes over time, the contribution of Internet banking to the total customer profitability may vary. The CLC is an appropriate framework which understands that customer online value changes over time.

Chapter 7   Epilogue

7.1   Summary

At the start of the 21st century there is a growing concern about a number of developments. There is a growing impact of technology on consumer experiences. The growth of the Internet has had a significant impact on the way consumers behave. The arrival of the Internet and the introduction of Internet banking, with its expected influence on consumer behaviour, is also relevant to the financial services sector. Another concern manifests itself in an increased trend towards individualization. The growing individualization of society is not in a hedonistic context, but in a communicative one. Also the financial services sector is dealing with a growing need for products and services adapted to consumers' idiosyncratic characteristics and preferences.

It is relevant to study the influence of these developments on consumer behaviour. However, financial services providers have difficulties with analysing online behaviour in order to understand customer relationships through the Internet. It is important to have a deeper insight into online behaviour at an individual level. The following topics are studied to find an answer to the research problem:

- What is an appropriate conceptual framework to understand longitudinal online banking behaviour (chapter 2)?
- What is an appropriate research methodology to analyse online banking behaviour (chapter 3)?
- How to analyse customer behaviour on a web-banking site (chapter 4)?
- How to analyse customer development and retention on a web-banking site (chapter 5)?
- Is there a relationship between customer satisfaction, loyalty and profitability on a web-banking site (chapter 6)?

Elaborating on the conclusions of these topics, recommendations for future research and managerial implications have been made.

7.1.1   *The CLC as an appropriate framework for understanding longitudinal online banking behaviour*

In a competitive environment, like the Internet, financial services providers have to service customers and prospects appropriately. According to the direct-marketing strategy, financial

services providers should be able to deliver the requested services in order to create and maintain customer relationships. However, customers are using the Internet and other self-service channels. To get closer to the customer, banks and other financial institutions need to create one-to-one relationships with their customers through the Internet considering customer personal preferences.

The dynamics of customer *online* behaviour is reflected in the customer life cycle (CLC). The CLC is a conceptual framework which presents customer behavioural changes over time. There are two valid reasons to suggest the CLC is an appropriate conceptual framework:

+ In order to create and maintain customer relationship, customer behaviour might not be perceived as single actions but as a pattern of developing behaviour over time. The interaction between customers and financial services providers ought to be a structural and an ongoing process. The CLC understands that a customer's financial behaviour changes over time, especially in a changing environment like the Internet.

+ Financial services providers need to know how to identify the visitors who will develop over time and become loyal and profitable customers. Customer loyalty is the final stage during the customer life cycle model.

To add concepts of direct marketing, such as creating and maintaining a relationship, to the CLC banks and other financial institutions might have a better understanding of customer development and retention on a web-banking site. Within this framework there are a myriad of possibilities to direct customer behaviour to optimise customer online profitability.

The interactive format of Internet banking helps to create and improve customer relationships. Several marketing (inter-)actions are needed to create relationships between banks and their customers through the Internet. Maintaining customer relationships must also be a part of the marketing strategy. The goal is that customers return to the website. A website must enforce long-term stickiness, and it needs to create a financial hurdle that discourages customers from switching to competitors (Nemzow, 1999). With the CLC as an appropriate framework financial services providers know how to guide new customers and how to intervene in undesired behaviour or pending inactivity.

7.1.2   Clickstream analysis as an appropriate research methodology to analyse online banking behaviour

Many financial services providers still consider the Internet as a 'black box' in which little insight is provided into online behaviour. Banks and other financial institutions need an appropriate research methodology to analyse and monitor customer online behaviour.

Clickstream analysis is an appropriate research methodology to analyse online behaviour at an individual level. Clickstream data are collected unobtrusively, based on observed behaviour, and the time pattern is recorded. Clickstream data displays customers' online behaviour at a very detailed level; every (milli-)second customers' online banking behaviour is recorded. The detailed records of web usage behaviour provide researchers and practitioners with the opportunity to study how users browse or navigate websites. Clickstream data from web-banking sites can be enriched with customer information from the marketing database. Thus, not only online customer behaviour can be viewed, but also customer behaviour through multi-channels like mail or telephone.

There are two steps defined in the suggested research methodology:

Step 1: Finding important relationships between certain types of behaviour and KPIs using 'exploratory statistical techniques' on the clickstream data. Perhaps unknown important factors are extracted from the data.

Step 2: Monitoring the KPIs and other important factors using clickstream data. Time series show the sensitivity of the clickstream data. This step is also defined as Statistical Process Control (SPC).

The opportunities for clickstream analysis are far-reaching. It is suggested that clickstream analysis operates as a tool for optimising the website (chapter 4) as well as directing customers for marketing purposes (chapter 5). Based on our experiences with clickstream analysis the benefit, in contrast to other research methodologies (for example market research and OLAP tools), is that clickstream analyses operate 'bottom up' and as 'need-to-discover' on the data. Perhaps important unknown relationships between certain types of surfing behaviour may be found. Clickstream analyses are able to explain the mechanism of online behaviour. It opens up the black box and illuminates online banking behaviour.

7.1.3   Analyse customer behaviour on a web-banking site by using statistical techniques on clickstream data

To analyse clickstream data it is possible to have a clear insight into the visitor's online behaviour at an individual level. There is a wide range of statistical research techniques for

analyzing clickstream data, for example regression analysis or cluster analysis. The author reported on a real-world application of analyzing clickstream data from a financial institution in The Netherlands. Four applications of analysing clickstream data are shown:

♦   Tracking website usage

♦   Monitoring key performance indicators (KPI)

♦   Analyzing relationship between visitor's surfing behaviour and KPI

♦   Segmentation of visitors' sessions

These applications prove that analyzing clickstream data may functions as (1) a monitor for a system of KPIs as well as (2) a tool for improving the structure and content of a website. In order to optimise the website clickstream analysis proved to be an appropriate research methodology.

7.1.4   *Monitor customer development and retention on a web-banking site by analyzing clickstream data*

It is important to monitor and evaluate online behaviour at an individual level. Companies that do not optimise customer intelligence are losing grip on their customers. Also the financial services providers should try to create a one-to-one relationship with customers. To build relationships they must identify which visitors develop over time and become established loyal customers. Is it possible to distinguish online behaviour of visitors from registered customers? Clickstream analyses are needed to differentiate usage behaviour on a web-banking site.

The author reported on a real-world application of customer development and retention on a web-banking site with the use of clickstream data from a financial institution in The Netherlands. Contrary to visitors, customers show a noticeable increase of 'online activity' during their first weeks. And also in respect of 'type of online activity', registered customers also differ from visitors during their first weeks. Online activity as well as type of online activity has a relevant contribution in predicting an active user. Who follows the behavioural pattern of an active user, might turn into a loyal customer after a while. Clickstream analyses might help to grow customer relationships by analysing and identifying potentially loyal customers.

However, it appeared that it is difficult to detect a change in online activity for visitors and customers during the last weeks on a web-banking site. This means that there are hardly any possibilities of predicting online attrition. Building a profitable website that retains customers and forges a strong community of users is a lot more complicated than designing

lots of colourful web pages and waiting for the revenue to roll in (Wiegran & Koth, 1999). Perhaps websites are successful in luring visitors to their sites but not at getting these visitors to buy or at turning occasional buyers into frequent ones (Agrawal et al., 2001). To ensure profitability in the long-run online customer retention becomes more and more important (Wiegran and Koth, 1999). Nemzow (1999) stated, if banks strive to enhance customer retention, they must lock customers into a process that is not easily duplicated, and when performed well, not easily abandoned. Based on clickstream data banks should implement an 'early warning system'. With this they are able to detect a negative change in online behaviour of potential defectors. At least all customers with activity below average should be contacted. E-marketers may come up with interventions to change this adverse behaviour and to stimulate desirable behaviour.

7.1.5   *Satisfied customers who are willing to recommend product and services to others are also profitable customers*

Establishment of stable relationships is becoming a key target of marketing efforts. However, not all customers with a long-lasting relationship are profitable customers. Normally, customers are highly loyal with their financial services providers. This is probably not true on the Internet, where the opportunities for customer loss may occur at any second.

A survey was conducted in order to find a relationship between online behaviour, online satisfaction, loyalty and customer profitability. The author reported on a real-world application of customer loyalty to a web-banking site of a financial institution in The Netherlands.

The author could not find a significant relationship between customer satisfaction with the web-banking site and customer profitability. A relationship between someone's intention to recommend the web-banking site to others and customer profitability was found. However, if a customer is willing to recommend the web-banking site to others she is probably satisfied herself with the web-banking site. Unless, those customers who are willing to recommend the web-banking site others are also willing to recommend all kind of products to others. If the customer is satisfied or not, the web-banking site is recommended to others by the customer in the end. It is nevertheless important to turn the customer into an advocate. Marketers must strive to identify and to maintain satisfied customers who are willing to recommend product and services to others.

What is the contribution of these outcomes to our knowledge of consumer behaviour? Each website is designed for a specific purpose, for example MO is designed to provide

information about mortgages and SO is designed to perform stock exchanges. Analyzing clickstream data from different websites generates different outcomes. This makes it difficult to draw conclusions about online behaviour of consumers in general. However, this study provides an appropriate research methodology which helps how to analyse and interpret consumer behaviour on different websites. Analyzing clickstream data opens a window with many research opportunities.

7.2   Recommendations for future research

This dissertation considered the behavioural aspects of customers on a web-banking site. The author provided suggestions for an appropriate conceptual framework and research methodology to analyse and interpret online banking behaviour. To stress the relevance of this study, several real-world cases have been provided. As mentioned as limitations of this dissertation (see § 1.4), there are still some other topics underexplored. For example, this study only focussed on the relationship between financial institutions and private customers. The recommendations might also be applicable for business-to-business relationships. Future research should focus on the differences in online financial behaviour between small businesses and private customers.

Furthermore, clickstream analyses are not only applicable for online financial behaviour, but of course for any other kind of online behaviour as well, such as online behaviour on web sites with games or about travelling. Future research should focus on the differences in online financial behaviour and other types of online behaviour. The author would like to underline two other interesting recommendations for future research which are not fully explored in this dissertation:

♦   Research techniques analyzing clickstream data,
♦   Contribution of psychological factors,
♦   Family roles in purchasing behaviour.

In the following sections, these three recommendations for future research regarding financial behaviour on the Internet are described.

7.2.1   Research techniques analyzing clickstream data

Every person is unique in his or her thinking and handling. These individual differences imply an idiosyncratic approach of understanding customer behaviour at an individual level. There are several ways to analyze customer online behaviour. The benefits of clickstream analyses to understand customer online behaviour were enlightened in this dissertation (see § 3.4). And

the differences between clickstream analyses, OLAP tools and market research (see § 3.5) were described. Alternative research methods, like usability tests or eye-tracking analyses, also help to understand online behaviour and might contribute to the design of websites.

As described in chapter 3, clickstream data displays customers' online behaviour in detail; every (milli-)second customers' online behaviour is recorded. Clickstream data is very sensitive to every small change in customer behaviour. It is collected unobtrusively and based on observed behaviour. The presence of clickstream data as a new data source is not necessarily sufficient to call for a new program of research (Bucklin et al., 2002), but further research could focus on the utilization of existing research techniques on clickstream data.

This dissertation explored successfully a range of existing statistical research techniques, such as Logistic Regression Analyses and GLM Repeated Measurement, to analyse customer online behaviour. There are also other possibilities to explore clickstream data by using different kinds of statistical research techniques:

- In chapter 4 and 5 customer online behaviour is classified as a typology of sessions. During each session a visitor follows a sequence of requested pages. Depending on the strategy of the website, only a limited number of clicking patterns is desirable. To discover different kinds of clicking behaviour in the clickstream data, a classification technique, for example CHAID (Chi-square Automatic Interaction Detector), is appropriate for this purpose.

- In chapter 4 and 5 several time series of visitors' behaviour on a web-banking site were shown. Patterns of customer clicking behaviour do not appear in isolation but as part of a series in time. To get insight into how customer online behaviour develops over time, a sequential pattern of sessions can be found with the Markov Modelling technique.

- In chapter 5 defection behaviour of customers on a web-banking site was predicted. Another interesting research technique for modelling defection behaviour is survival analysis. The goal of survival analysis is to characterize the distribution of the survival time for a group of customers, to compare this survival time among different groups of customers, or to study the relationship between the survival time and other variables.

- Collaborative filtering is a technique that allows incorporation of user preferences or behaviour in order to develop predictive models. These models are input for personalized recommendations for information, products or services. The tremendous growth in the amount of available information and the number of visitors to websites in recent years poses some key challenges for analyzing clickstream data, modelling techniques and recommendation systems.

7.2.2   Contribution of psychological factors

Another interesting line of research would be including psychological factors, for example Internet Attitude. Some people are highly interested in new technology, e.g. computer-experts, while others dislike technological innovations. Regarding the technology acceptance model (TAM), which is based upon principles originally articulated by Fishbein and Azjen (1975), actual behaviour is moderated by attitude. The intention and the actual behaviour have been found to be highly correlated. The attitude towards technological innovations is playing an important role in today's society.

Another psychological factor might be self-efficacy. Bandura (1986) introduced the construct of "perceived self-efficacy", which concerns people's perception of one's capabilities to organise and execute courses of action about to be undertaken. Some people are capable of managing today's technological innovations perfectly, while others face problems and are not motivated to catch up with the fast changing world. However, both types of customers prefer an efficient way of arranging their own financial household. Therefore, it would be interesting to have a better understanding of customers' attitudes towards new technology, as well as their confidence in their abilities to manage technological innovations.

Besides Internet attitude and self-efficacy, there are other psychological factors, such as trust (based on experiences), self-confidence (related to risk-perception) and commitment (related to loyalty), to include in the research program as well. It is our belief that customer online financial behaviour is partly driven by psychological processes (Van Meer, 2001). Future research should also focus on the interpretation of psychological factors and on the relationship between those factors and customer online behaviour.

7.2.3   Family roles in purchasing online behaviour

In this dissertation the online behaviour is analysed at an individually level, but some decisions about financial products, for example mortgages, are made at a family level. As far as we know, it has never been researched what different marital roles influences the purchase of financial products or services through the Internet. Studies have found that men and women perceive their roles differently during the phase of problem recognition and during the phase or orientation. However, during the phase of decision making the marital roles are less specific (Davis & Rigaux, 1999). Of course, it all depends on what type of financial product or service. It might be interesting to study the different roles within the family regarding financial products or services in relation to online purchasing behaviour.

7.3   Managerial implications

Financial services providers are dealing with the issue "how to integrate Internet banking in the direct-marketing strategy"? There are several interesting managerial recommendations provided in the following sections. The first two recommendations are derived from literature studies as part of this dissertation (see chapters 1 and 2):

+ Interactivity
+ Personalization

These two recommendations are at a strategic level and are focussed on how to integrate Internet banking in the direct-marketing strategy.

The other two managerial recommendations are syntheses of the confirmatory studies, and are focussed on "how to analyse customer online banking behaviour in order to understand customer relationships through the Internet (see chapters 3, 4, 5 and 6)":

+ Align clickstream analyses with the marketing process.
+ Monitor customer satisfaction and loyalty, and customer online value.

7.3.1   *Recommendations from literature studies*

In the following sections the recommendations that might help to integrate Internet banking in the direct-marketing strategy are described.

7.3.1.1 *Interactivity*

Society is a network of relationships within we interact, and marketing is a dimension of society (Gummesson, 2002). Building relationships without the interaction between customer and supplier is impossible - the construct of interactivity was described in detail in section 2.2. New technology is making it possible for customers and suppliers to spend more time in communicating with each other. With the help of interactive media, consumers can take the initiative to communicate, retrieve the information they want and where they want it, and then, if they choose, order various products and services (Antonides & Van Raaij, 1998). Nowadays, banks have developed technologies to change their communication to the customers in real-time. The web allows them to offer products to the customer and the interactive format could help to create and improve customer relationships. Compared with traditional channels, banks must take advantage of the interactive features of the Internet. Interactive tools, such as calculators, a mainstay component of most financial websites, are examples of cross-sell opportunities. The calculators are unequivocal indicators of customer

interest. Leveraging these tools may have a direct effect on conversion rates for the website. There are also a few other interesting applications of online interactivity. Firstly, banners illustrate how interactivity could be implemented in the financial services sector. People who browse on the Internet are exposed to advertisements in the form of banners. Interactive banners are dynamic, replaced at every new visit and contain animated elements and/or loops through a number of messages. Products advertised in banners are sometimes only one or two clicks away. Consumers may click the banner, enter their personal details and have the product or service the next minute.

Other examples to increase the level of the interactivity are a chat function, bulletin board or a blog portal. Also discussion groups are an often overlooked but potentially important form of interactive marketing. The key to an effective discussion forum is to respect the non-commercial nature of the forum. Rather than advertising blatantly, companies should answer questions in a neutral manner, and then sell products and services solely through a short signature at the bottom of the message (Spencer, 2000). Already millions of people are communicating with each other through an instant messaging network, for example 'MSN Messenger', 'AOL' or 'Yahoo'. An interesting application to implement this type of interactivity in the financial services sector is to communicate online with customers through a webcam. With the help of new technology there is no need to visit the branch office anymore to communicate with the bank and receive a high quality of service. With the help of a webcam a customer hears and sees the call agent or intermediary as if they meet each other in person. Another application is 'co-browsing'. Co-browsing (collaborative browsing) is a software-enabled technique that allows an agent in a call center to interact with a customer by using the customer's web browser to show them something. For example, a customer having difficulty placing an order could contact the call center and the agent could then show and help the customer how to use the ordering pages. However, there are probably more customers than chat agents so unfortunately not all the customers have the access to the chat function. Perhaps some customers participate in Q&A (questions and answers) programs and receive an answer on an easy question from a robot unknowingly.

Another example is that banks and other financial institutions are able to use direct e-mailings to select target groups for sales promotion. The online format of e-mailings is a possibility for customers to link to the landing page of the product offer with all the detailed background information. On that part of the website customers are also able to enter their personal details and order the product or service. After sending the e-mailing it might also possible to extend the e-mail communication with the customer.

Personal computers are not the only way for the delivery of financial services. Another application of interactive online services is to provide the web-banking site in an appropriate format for mobile banking. Current mobile cell phones are equipped with GPRS (General Packet Radio Service) and UMTS (Universal Mobile Telecommunications System) technology. The convergence of the web and mobile networks creates new opportunities and applications. Today's banking is thereby not just online and wireless but also interactive (Mattila, 2003). With mobile banking customers are able to arrange their financial household whenever and wherever they want.

Interactivity is an important key to integrate Internet banking in the direct-marketing strategy of a bank. Banks should check if their Internet banking activity succeeds the criteria of an interactive format, these are:

♦ access on demand,
♦ synchronicity (brief response intervals of multiple bi-directional information exchanges),
♦ constructive and control,
♦ timeliness, and
♦ self-optimisation.

By increasing the level of interactivity the importance of tracking customer behaviour is also increasing. However, during the implementation of the technological innovations most companies pay too little attention to the storage of the customer contact in a data warehouse. This makes it impossible to analyze customer behaviour, and the consequence is that companies miss out on interesting (cross-)selling opportunities in the near future.

7.3.1.2 *Personalization*

Each customer has individualized needs and interests. In line with the increased individualization consumers ask for a more personal approach. They are demanding products and services adapted to their own needs. On the contrary, most financial products and contacts are standardized. An important criterion of personalised communication is the relevance of the proposition to the customer. If the customer is confronted twice or three times with an irrelevant product offer, he or she is likely to ignore all messages in the future. Besides this, most banks have difficulties to formulate the uniqueness of their own products in order to clarify the surplus value of these products to their customers.

If a bank wants to offer personalised services, it is necessary to fulfil the needs of customers and prospects. Companies adopted strategies that embrace a closer reaction to the customers' differentiated needs. As a consequence, many companies present themselves as customer oriented (Petrof, 1997). They realize that marketing can only be successful if the consumer is given a central position. Chain reversal (from supply towards demand-oriented) is the essence of 'mass individualization'. This means that the quality of interaction between the company and the customer is important to provide valuable info about the customer needs and interests. As a consequence fundamental changes in the delivery processes of a company are needed. An important feature of mass individualization is a direct interaction between the customer and the chain process. During the implementation of mass individualisation a possible intermediate stage is 'mass customisation'. Mass customisation is focussed on customising the product or service just at the end of the supply chain (end assembly), like the computer system company 'Dell.com' which sales hard- and software only through the web. It is the personalisation of products and services for individual customers at a mass production price (Pine, 1993). Mass customisation meets this challenge by offering individually customised goods and services with mass production efficiency (Piller & Müller, 2004). Piller and Müller (2004) stated that customisation can be carried out at three levels:

+ Style (aesthetic design): modifications aiming at sensual or optical senses, i.e. selecting colours, styles, applications, cuts or flavours.
+ Fit and comfort: customisation based on the fit of a product with the dimensions of the recipient, i.e. tailoring a product according to a life-cycle event. This is the traditional starting point for customisation (tailoring).
+ Functionality: customising option in regard to functionality or interfaces of the product. Functionality is often overseen when mass customisation is addressed.

These three levels of customisation differ in relevance depending on type of product or service. However, from a marketing perspective, customisation means to offer customers not any longer a product, but the capability to deliver an individual fulfilment solution. In the end the process of customisation serves to build up a lasting individual relationship with each customer.

Due to the innovations of interactive media, companies are able to offer their products to the personalised needs of the customer. It also encourages services providers with individualized customer-centric strategies to expand the depth of interaction. Real-time interactivity with customers enables individualized communication (Molenaar, 1993). With the Internet as

interactive media the financial services sector is able to personalise sites, and create opportunities for customisation and provide added value (Walsh & Godfrey, 2000). It allows the financial institutions to communicate and to service customers with an increasing possibility of cross-selling. Moreover, they may display advertising personalized to the customer based on his or her web-banking account usage statistics or behavioural profile (Prasad & Harker, 2000). Several online companies use content and/or collaborative filtering methods to recommend products or services to consumers (Walsh & Godfrey, 2000), like 'Amazon.com'. The goal is to convert the qualified visitor to a buyer. Predictive modelling can help to identify visitors who are most likely to purchase certain products based on their behaviour. Building customer life cycle models that account for key contact opportunities, marketers may recognize the contact opportunities and deliver relevant products or services immediately.

Nowadays most banks and other financial institutions are having a web-banking site where customers have access to an online application to perform their personal financial transactions. The best way to take advantages of customer individualized needs and interests is to create a 'personalized' web-banking site. An interesting application offer personalized online services is a Virtual Guardian Angel (Poiesz & Raaij, 2002). Not the customer but a 'virtual guardian angel (VGA)' selects several products and put together into an integrated and personalized service package. Poiesz and Van Raaij (2002) stated that creating a synergy between independent products and/or services, (is 'synergetic marketing'), should be the basis for long-term relationships. Another interesting possibility for banks to personalize web-banking sites is that they should let the customer herself consciously tailor the web-banking site to her own personal needs. The Internet also facilitates the user to select information individually (Bauer et al., 2001).). They can filter topics and functionalities that match their own profile and skill level.

In section 7.3.1.1 several examples of interactive communication in the financial services sector are described. Some of these examples are also useful to show interesting applications of offering personalized online services. One of these applications is personalized banners. A web-banking site should be able to show personal banners. These banners should be interactive, automatically customized for individual users. When a consumer is exposed to an interactive banner advertisement, it will not only allow the consumer to purchase the product. The banner will also remember that it created interest or even made a sale. Thus, the next time it should probably try to advertise another relevant product.

An application of communicating online through an instant messaging network (chat, co-browsing and webcam) is already described in section 7.3.1.1. This type of interaction might also increase the level of personalized communication with customers in the financial services sector. A chat platform on the web-banking site with an agent from the bank is an interesting application to offer personalized online services.

Another application to offer online services is personalized e-mailing. The interactive format of emailing is already described in section 7.3.1.1. Sending e-mailings to customers instead of traditional mailings raise some issues. Consumer e-mail marketing is adapting to the greater volume of e-mail they receive. Not all the e-mailings customers receive are perceived as relevant to their needs, for example spam. Spam is defined as unsolicited commercial e-mailing. Consumers are growing more selective in what they choose to open or not. If executed improperly though, e-mail campaigns can backfire with disastrous business consequences: loss of customers who have been irritated by receiving irrelevant e-mails. The solution for this problem is 'permission marketing', in which customers or prospects volunteer to receive e-mail. Moreover, customers should be able to activate filters themselves to receive the e-mailings they want on specific subjects, for example stocks or pensions. E-mail marketers can use these filtering techniques to better segment and target their customers. As customers are becoming more selective to e-mailings marketers must follow their customers and adjust their tactics or risk further deterioration in click through rates (CTR). Marketers want their messages to be read, while recipients want their e-mail to arrive in manageable quantities and to include substantive, relevant content (Godin, 1999). Focusing on message relevance is therefore extremely important for marketers.

Analyzing customer online behaviour at an individual level is an important contribution to personalization through the web in the financial services sector. Clickstream analyses are an appropriate methodology to do so. However, an important issue regarding analyzing customer data is the privacy of the customers. Banks should keep in mind that financial data is very personal. Not all customer information is allowed for commercial usage. There are some severe guidelines from the national authority which supervises banks how they must manage financial data. Every marketer and researcher has a responsibility to make sure that customer information is used in such a way that the customer would not consider this a violation of trust. Financial services providers must explore the boundaries of the legislation, and meanwhile continue to find new ways to communicate with customers and prospects at a personal level.

7.3.2 Recommendations from confirmatory studies

The other two managerial recommendations are syntheses of the confirmatory studies (see chapters 4, 5 and 6), and are more focussed on how to analyse customer online banking behaviour in order to understand customer relationships through the Internet.

7.3.2.1 Build a webhouse and align clickstream analyses with the marketing process

The benefits of clickstream analyses for the financial services sector are exemplified in this dissertation. In the first place, financial services and products are non-tangible and digitally stored. Secondly, most consumers use the Internet to retrieve information about financial services and products, resulting in a high frequency of financial behaviour among consumers. In addition, clickstream data displays customers' online behaviour in detail; every (milli-)second customers' online behaviour is recorded. The result is an immense quantity of data of customer offline and online behaviour. Clickstream analyses are able to explain the mechanism of customer (online) behaviour at the individual level. If a new research methodology, like clickstream analyses, is introduced in a bank, a sponsor in senior management must support the introduction of this methodology.

An important step for banks and other financial institutions is to build a data warehouse on clickstream data: a webhouse. A webhouse is essentially a data warehouse intended to capture clickstream data for e-commerce decision making (Kimball & Merz, 2000). In the brick-and-mortar world one can get a sense of what is happening by simple human observation, but in the cybernetic Internet environment, without a clickstream data warehouse you are essentially deaf and blind (Sweiger, 2002). Without a clickstream data warehouse, the e-business environment can be remarkably opaque - often nothing more than a set of grand assumptions with little understanding of the actual dynamics of the underlying user community (Sweiger, 2002). Webhousing and clickstream analyses radically improve the strategic knowledge of customer online behaviour. It plays a central and a crucial role in the operations of the web enabled business (Kimball & Merz, 2000).

Clickstream data proved to be a very powerful data source, and, if possible, it should be enriched with data on customer behaviour from the back office. It is an important challenge to connect the clickstream data with other types of data. It is therefore necessary to log a unique user identification key (e.g. account number or relation number) in the clickstream data. With this key it is possible to identify and connect customer online banking behaviour with other types of offline behaviour. Not only online customer behaviour can be viewed, but also customer behaviour through multi-channels like mail or telephone. An integrated multi-

channel approach is superior to those in which the channels are essentially autonomous and independent of each other. Accordingly, a multi-channel approach impacts positively on consumers. They use the channels more frequently, buy more from them and there is a positive customer-loyalty impact (Schramm-Klein & Morschett, 2005). The connection with different types of data sources generates opportunities to obtain an integral picture of customer behaviour at an individual level.

Information that reflects online behaviour can be extracted from large data files with clickstream data. If banks and other financial institutions do not decide to capture data on all visitors, they should at least select and store a small sample of clickstream data of a representative set of customers. This sample of clickstream data is a playground for researchers and analysts to explore customer online behaviour. Before analyzing, extensive data preparation of the imported data files is necessary. This is rather complex and requires specific expertise in data warehouse management. Researchers and data analysts have access to different databases and have a wide range of statistical tools. They are capable to use suitable research techniques to analyze online behaviour. Research techniques, for example predictive modelling, may help to identify customers who are most likely to purchase certain products based on their (online) behaviour. As a result of modelling, the profiling scores of all customers should be added into marketing database. This information can be used to drive the specific content of marketing programs that are most likely to lead to purchases. The Internet and interactive online applications are creating new opportunities for statistical techniques. However, it takes years to build experiences on this specific area. It is important for banks to develop the expertise in how to analyse online behaviour, and keep the knowledge in-house. Systematic experimenting is an iterative process in which the results should be utilised in the daily marketing practice. It is necessary to analyze and test everything, and refine continually. Data analyses and modelling activities is a strategic asset of a company. In order to align data analyses and modelling activities with the marketing business process, it is necessary to have a Research & Developing (R&D) department with qualified researchers and data analysts.

Referring to the research problem (see section 1.4) banks and other financial institutions need an appropriate research methodology to be able to analyse and monitor customer online behaviour at an individual level. There are two steps defined when clickstream analyses are an appropriate research methodology. The first step is finding important relationships between certain types of behaviour and KPIs using 'exploratory statistical techniques' on the

clickstream data. The second step is monitoring the KPIs and other important factors throughout the customer life cycle.

7.3.2.2 *Monitor customer behaviour, satisfaction, loyalty and customer online value throughout the customer life cycle*

An important marketing tactic is to monitor and to evaluate customer satisfaction, loyalty and customer online value at an individual level over time. In order to increase profitability of the web-banking site, banks must identify and track satisfied and loyal customers throughout the customer life cycle. The customer life cycle (CLC) describes the progression of phases a customer goes through when considering, purchasing, using, and maintaining loyalty to a product or service. It understands that a customer's financial behaviour changes over time. To analyse customer satisfaction with and loyalty to a web-banking site, banks should monitor every half year 'customer satisfaction', 'customer loyalty' and the 'willingness to recommend the web-banking site to others' of their own customers and of those of their main competitors.

An interesting line of research would be including clickstream analyses to study the relationship between customer attitude towards a web-banking site and their actual online behaviour. To measure customer online activity, banks should collect clickstream data and analyse customer online behaviour. The CLC is an appropriate conceptual framework to understand customer online behaviour and development over time. Clickstream analysis functions as a monitor for a system of Key Performance Indicators (KPIs). With the proper infrastructure, monitoring customer development is possible from day-to-day. At an operational level, a monitoring system must function as an early warning system for predicting customer behaviour that leads to inactivity.

At last, to measure customer online value over time, banks should calculate a derivate of the contribution of Internet banking to the total customer profitability. As customer financial behaviour changes over time, the contribution of Internet banking to the total customer profitability may also vary. The basic idea behind CLC is to analyse customers' value throughout their CLC to obtain the insight necessary to plan profitable interactions. Banks should set up a monitoring system to monitor and evaluate customer online value over time.

The CLC is more volatile for interactive businesses than for traditional businesses. The behaviour ramps up faster at the beginning of the CLC, but then falls off faster at the end of the cycle (Novo, 2004). The speed of behaviour change is incredibly important to modelling interactive behaviour, much more important than in offline models. Small changes over time

are to be expected; rapid and accelerating changes are much more significant and a signal for action. Thus, it is important to identify several types of customer online behaviour and re-profiling customers at certain intervals and keep track of them over time.

7.4   Final remarks

Research is not about crunching numbers but to improve the quality of decision-making. Applied science contains scientific fields which have the purpose to solve practical problems. It is the counterpart of pure science which is the exact science of the development of scientific theories, without consideration of their application. Knowledge without using it is useless. Albert Einstein[3] said: "Why does this applied science, which saves work and makes life easier, brings us so little happiness? The simple answer runs: because we have not yet learned to make sensible use of it". In order to stress the importance and the relevance of this study several examples from practice were provided. The usefulness of this study depends on the practical execution of the outcomes in today's practice. Cooperation between academia and the financial services sector is needed to set up pilots to study online behaviour and customer relationships.

To wind up with, as long as the technological innovations and the trend towards individualization proceed, the Internet is creating new opportunities for analyzing online behaviour. At the moment the financial services sector is at the beginning of the exploration of analyzing financial behaviour of customers on the Internet. However, consumer expectations have increased significantly. They expect state-of-the-art technological innovations from large institutions that make billions of profit on a yearly basis. Banks and other financial institutions are facing the challenge to fulfil these expectations and to increase customer satisfaction towards financial services on the Internet.

---

[3]   Albert Einstein (1879-1955) was a theoretical physicist. He proposed the theory of relativity and also made major contributions to the development of quantum mechanics, statistical mechanics, and cosmology. He was awarded the 1921 Nobel Prize for Physics for his services to Theoretical Physics".

References

Agrawal, V., Arjona, L.D. & Lemmens, R. (2001). E-perfomance: The Path to Rational Exuberance. *The McKinsey Quarterly*, No 1, 31-43. Retrieved from http://www.mckinseyquarterly.com.

Antonides, G. & Van Raaij, W.F. (1998). *Consumer Behaviour - A European Perspective*. Chichester: John Wiley.

Antonides, G. & Van Raaij, W.F. (1999). *Cases in Consumer Behaviour*. Chichester: John Wiley.

Anderson, E.W. & Sullivan, M.W. (1993). The Antecedents and Consequences of Customer Transactions for Firms. *Marketing Science*, 12, 125-143.

Anderson, C. (1995). Computer as Audience. In: Forrest, E. & Mizerski, R. (Eds.), *Interactive Marketing: The Future Present* (149-162). Lincolnwood (IL): NTC Business Books.

Ansari, A., Essegaier, S. & Kohli, R. (2000). Internet Recommendation Systems. *Journal of Marketing Research*, 37, 363-375.

Bandura, A. (1986). *Social Foundations of Thought and Action*. Englewood Cliffs (NJ): Prentice Hall.

Batista, P. & Silva, M.J. (2001). Mining Web Access Logs of an Online Newspaper. In: *Proceedings of 12th International Meeting of the Euro Working Group on Decision Support Systems*, Cascais (Portugal).

Bauer, H.H., Grether, M. & Leach, M. (2001). Customer Relations through the Internet. *Journal of Relationship Marketing*, 1 (2), 39-55.

Bearden, W.O. & Teel, J.E. (1983). Selected Determinants of Consumer Satisfaction and Complaint Reports. *Journal of Marketing Research*, 20 (February), 21-28.

Beck, U. (1997). *The Reinvention of Politics*. Oxford: Polity Press.

Beck, U. & Beck-Gernsheim, E. (2002). *Individualization, Institutionalized Individualism and its social and political consequences*. London: SAGE Publications Ltd.

Benzécri, J.-P. (1973). *L'analyse des données II. [Data Analysis II] L'analyse des correspondances [Analysis of Correspondences]* - third edition. Paris: Dunod.

Berger, P.D. & Nasr, N.I. (1998). Customer Lifetime Value: Marketing Models and Applications. *Journal of Interactive Marketing*, 12 (1), 17-30.

Berry, M.J.A. & Linoff, G. (1997). *Data Mining Techniques for Marketing, Sales and Customer Support*. New York: John Wiley.

Bloemer, J.M.M. & Th.B.C. Poiesz (1989). The illusion of consumer satisfaction. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 2, 43-48.

Bolton, R.N. & Drew, J.H. (1991). A Longitudinal Analysis of the Impact of Service Changes on Customer Attitudes. *Journal of Marketing*, 55 (January), 1-9.

Bracey, G.W. (1988). Computers and Anxiety in Education. *Electronic Learning*, (May) 26-28.

Browne, M.W. & Cudeck, R. (1989). Single sample cross-validation indices for covariance structures. British *Journal of Mathematical and Statistical Psychology*, 37, 62-83.

Bucklin, R.E. & Sismeiro, C. (2002). A Model of Website Browsing Behaviour. *Journal of Marketing Research*, (August), 249-267.

Buchanan, R. & Gilles, C. (1990). Value Managed Relationship: The Key to Customer Retention and Profitability. *European Management Journal*, 8 (4), 523-526.

Bucklin, R.E., Lattin, J.M., Ansari, A., Gupta, S., Bell, D., Coupey, E., Little, J.D.C., Mela, C., Montgomery, A. & Steckel, J. (2002). Choice and the Internet: From Clickstream to Research Stream. *Marketing Letters*, 13 (3), 245-258.

Catledge, L.D. & Pitkow, J.E. (1995). Characterizing Browsing Behaviours on the World Wide Web. *Computer Networks and ISDN Systems*, 27 (6), 1065-1073.

Chen, M.S., Park, J.S., & Yu, P.S. (1998). Efficient Data Mining for Path Traversal Patterns. *IEEE Transactions on Knowledge and Data Engineering*, 10 (2), 209-221.

Christopher, M., Payne, A. & Ballantyne, D. (1991). *Relationship Marketing: Bringing Quality, Customer Service and Marketing Together*. Oxford: Butterworth-Heinemann.

Cohen, J., Cohen, P., West, S.G. & Aiken, L.S. (2003). Applied Multiple Regression / Correlation Analysis for the Behavioral Sciences (3rd ed.). Mahwah (NJ): Erlbaum.

Comer, J.M., Mehta, R. & Holmes, T.L. (1999). Information technology: Retail users versus nonusers. *Journal of Interactive Marketing*, 12 (2), 49-62.

Cooley, R., Mobasher, B., & Srivastava, J. (1999). Data Preparation for Mining World Wide Web Browsing Patterns. *Journal of Knowledge and Information Systems*, 1 (1), 11-15.

Crotts, J.C. & Van Raaij, W.F. (1994). *Economic Psychology of Travel and Tourism*. Binghamton (NY): The Hawthorne Press Inc.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, (35) 982-1003.

Davis, H.L. & Rigaux, B.P. (1974). Perception of Marital Roles in Decision Processes. *Journal of Consumer Research*, 1 (1), 51-62.

Davis, S. & Meyer, C. (1998). *BLUR: The Speed of Change in the Connected Economy.* Reading (MA): Addison-Wesley.

Dick, A.S. & Basu, K. (1994). Customer loyalty: Toward an Integrated Conceptual Framework. *Journal of the Academy of Marketing Science*, 22, 99-113.

Diniz, E. (1998). Web-banking in USA. *Journal of Internet Banking and Commerce*, 3 (2). Retrieved from http://www.arraydev.com/commerce/JIBC/9806-06.htm

Dishaw, M.T. & Strong, D.M. (1999). Extending the Technology Acceptance Model with Task-Technology Fit Constructs. *Information & Management*, (36) 9-21.

East, R., Sinclair, J. & Gendall, P. (2000). Loyalty: Definition and Explanation. In A. O'Cass (Ed.) Visionary Marketing for the 21st Century: Facing the Challenge. *Proceedings of The Australian & New Zealand Marketing Academy Conference*, Griffith.

Egan, J. (2001). *Relationship Marketing: Exploring Relational Strategies in Marketing.* London: Pearson Education Limited.

Fishbein, M., Ajzen, I. (1975). *Belief, Attitude, Intention and Behaviour: An introduction to Theory and Research.* Addison-Wesley, Reading, MA.

Godin, S. (1999). *Permission Marketing: Turning Strangers into Friends and Friends into Customers.* New York: Simon & Schuster.

Greenacre, M.J. (1984). *Theory and Applications of Correspondence Analysis.* London: Academic Press.

Griffin, J. (2002). *Customer Loyalty: How to Earn It, How to Keep It* (revised edition). San Francisco: Jossey-Bass.

Grönroos, C. (1992). Service Management: A Management Focus for Service Competition. In Lovelock, C.H. (Ed.) *Managing Services: Marketing, Operations, and Human Resources* (2nd edition). Englewood Cliffs (NJ): Prentice-Hall, 9-16.

Grönroos, C. (1997). Value-driven Relationship Marketing: From Products to Resources to Values. *Journal of Marketing Management*, 13 (5), 407-420.

Grönroos, C. (2000). *Service Management and Marketing.* Chichester: Wiley.

Gummesson, E. (2002). *Total Relationship Marketing* (revised 2nd edition). Oxford: Butterworth-Heinemann.

Haeckel, S.H. (1998). About the Nature and Future of Interactive Marketing. *Journal of Interactive Marketing*, 12 (1), 63-71.

Hagel, J. & Armstrong, A.G. (1997). Net Again. Expanding Markets through Virtual Communities. *The McKinsey Quarterly*, No. 1, 140-153.

Heeter, C. (1989). Implications of New Interactive Technologies for Conceptualizing Communication. In J.L. Salvaggio & J. Bryant (Eds), *Media Use in the Information Age: Emerging Patterns of Adoption and Consumer Use* (217-235). Hillsdale (NJ): Erlbaum.

Hirst, A. (1999). Channel crossings. *The Banker*, (September), 72-73.

Hoekstra, J.C. (1994). *Van respons tot relatie* (Dutch). An inaugural speech at Erasmus University Rotterdam. Groningen (Holland): Wolters-Noordhoff.

Hoffman, D. & Franke, G. (1986). Correspondence Analysis: Graphical Representation of Categorical Data in Market Research. *Journal of Marketing Research*, 23, 213-227.

Holder, D. (1998). *The Absolute Essentials of Direct Marketing*. In: *Proceeding of the Institute of Direct Marketing Seminar*, Bristol (UK).

Holmes-Smith, P. (2000). *Introduction to structural equation modelling using AMOS 4.0 & LISREL 8.30*. Canberra: School Research, Evaluation and Measurement Services.

Homburg, C., Koschate, N. & Hoyer, W. (2005). Do Satisfied Customers Really Pay More? A Study of the Relationship between Customer Satisfaction and Willingness to Pay. *Journal of Marketing*, 69, 84-96.

Javalgi, R.G. & Dion, P. (1999). A Life Cycle Segmentation Approach to Marketing Financial Products and Services. *The Service Industries Journal*, 19 (3), 74-96.

Kandampully J. & Duddy R. (1999). Relationship Marketing: A Concept Beyond the Primary Relationship. *Marketing Intelligence and Planning*, 17 (7), 315-323.

Kalakota, R. & Whinston, A.B (1996). *Frontiers of Electronic Commerce* (1st ed). Reading (Mass) Addison-Wesley Pub.

Kierzkowski, A., McQuade, S., Waitman, R. & Zeisser, M. (1996). Marketing to the Digital Consumer. *The McKinsey Quarterly*, 3, 5-21.

Kimball, R., & Merz, R. (2000). *The Data Webhouse Toolkit: Building the Web-Enabled Data Warehouse*. New York: John Wiley.

Kohavi, R. & Parekh, R. (2003). Ten Supplementary Analyses to Improve E-commerce Websites. In: *Proceedings of the Fifth WEBKDD: Web Mining as a Premise to Effective and Intelligent Web Applications*, Washington DC.

Koohnag, A.A. (1986). The Effects of Age, Gender, College Status, and Computer Experiences Attitudes towards the Library Computer System (LCS). *Library and Information Science Research*, (8) 349-355.

Körner, V. & Zimmerman, H.D. (2000). Management of Customer Relationship in Business Media – The Case of the Financial Sector. In: *Proceeding of the 33rd Hawaii Conference on Systems Sciences*.

Kotler, P. & Armstrong, G. (2003). *Principles of Marketing* (10th edition). Harlow: FT Prentice Hall.

Kuijlen, A.A.A. (1993). *De scenariobenadering: een onderzoek naar complexe consumentenbeslissingen met behulp van computergestuurd enquêteren* (Dutch). Dissertation at the University of Tilburg.

Lederer, A.L., Maupin, D.J., Sena, M.P. & Zhuang, Y. (2000). The Technology Acceptance Model and the World Wide Web. *Decision Support Systems*, 29 (3), 269-282.

Linoff, G.S. & Berry, M.J.A. (2002). *Mining the Web: Transforming Customer Data into Customer Value*. New York: John Wiley.

Loudon, D.L. & Della Bitta, A. (1993). *Consumer behaviour: Concepts and Applications* (Fourth edition). London: MacGraw Hill.

Loyd, B.H. & Gressard, C.P. (1984). The Effects of Sex, Age, and Computer Experience on Computer Attitudes. *Association for Educational Data Systems Journal*, (18) 67-77.

Mannila, H., & Toivonen, H. (1996). Discovering Generalized Episodes Using Minimal Ocurrences. In: *Proceedings of the Second International Conference on Knowledge Discovery and Data Mining*, pp. 210-215, Montreal (Quebec).

Martin, R. (1991). School Children's Attitudes towards Computers as a Function of Gender, Course Subjects, and Availability of Home Computers. *Journal of Computer Assisted Learning*, 7 (3), 187-194.

Mattila, M. (2003). Factors Affecting the Adoption of Mobile Banking Services. *Journal of Internet Banking and Commerce*, 8 (1). Retrieved from http://www.arraydev.com/commerce/JIBC/0306-04.htm

Mattison, R. (1999). *Web Warehousing and Knowledge Management*. New York: McGraw-Hill.

Maynes, E.S. (1976). *Decision Making for Consumers: An Introduction to consumer Economics*. New York: MacMillan Publishing Co. Inc.

McCarthy, E.J. (1960). *Basic Marketing: A Managerial Approach*. Homewood (IL): Richard D. Irwin Inc.

McKenna, R. (1991). Marketing is Everything. *Harvard Business Review*, 69 (1), 65-79.

McMillan, S.J. (2000). Interactivity is in the Eye of the Beholder: Function, Perception, Involvement, and Attitude toward the Website. In: M.A. Shaver (Ed.), *Proceedings of the American Academy of Advertising Conference* (71-78). East Lansing (MI).

Mena, J. (1999). *Data Mining your Website*. Boston: Digital Press.

Mobasher,B., Cooley, R. & Srivastava, J. (2000). Automatic Personalization Based on Web Usage Mining. *Communications of the Association for Computing Machinery*, 43 (8) 142-151.

Modigliani, F. & Abel, A. (1980). *The Collected Papers of Franco Modigliani, The Life Cycle Hypothesis of Saving*. Cambridge: MIT Press.

Moe, W.W. & Fader, P. (2002). Capturing Evolving Visit Behaviour in Clickstream Data. *Journal of Interactive Marketing*, 18 (1), 5-19.

Molenaar, C.N.A. (1993). *Interactieve marketing: het einde van de massamarketing* (Dutch). Amsterdam: Management Press.

Molenaar, C.N.A. (1997). *New Marketing: Toepassingsmogelijkheden van informatie-technologie in marketing* (Dutch). Doctoral dissertation at the University of Groningen.

Molenaar, C.N.A. (1999). *Marketing op de drempel van de 21e eeuw: verandering of vernieuwing?* (Dutch). An Inaugural Speech at Erasmus University Rotterdam.

Morgan, R. M. & Hunt, S. D. (1994). The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*, 58 (3), 20-38.

Murphy, P.E. & Staples, W.E. (1979). A Modernized Family Life Cycle. *Journal of Consumer Research*, 6, 12-22.

Nemzow, M. (1999). E-commerce "Stickiness" for Customer Retention. *Journal of Internet Banking and Commerce*, 4, no. 1. Retrieved from http://www.arraydev.com/commerce/JIBC/9908-03.htm

Novo, J. (2004). *Drilling Down: Turning Customer Data into Profits with a Spreadsheet* (3rd edition). Bangor (ME): Booklocker Inc.

Oliver, R. L. (1997). *Satisfaction: A Behavioral Perspective on the Consumer*. New York: Mcgraw-Hill.

O'Malley, L. (1998). Can Loyalty Schemes Really Build Loyalty? *Marketing Intelligence & Planning*, 16 (1), 58-67.

Paas, L.J., Kuijlen, A.A.A. & Poiesz, T.B.C. (2005). Acquisition Pattern Analysis for Relationship Marketing: A Conceptual and Methodological Redefinition. *Services Industries Journal*, 25 (5), 661-673.

Peppers, D., Rogers, M. & Dorf, B. (1999). *The One to One Fieldbook: The Complete Toolkit for Implementing a 1:1 Marketing Program*. Oxford: Captone Publishing.

Peppers, D. & Rogers, M. (2005). *Return on Customer: Creating Maximum Value from Your Scarcest Resource*. New York: Doubleday Publishing.

Petrof, J.V. (1997). Relationship Marketing: The Wheel Reinvented? *Business Horizons*, 40 (6), 26-31.

Piller, F.T. & Müller, M (2004). A New Marketing Approach to Mass Customisation. *International Journal of Computer Integrated Manufactering*, 17 (7), 583–593.

Pine, B.J. II (1993). *Mass Customization - The New Frontier in Business Competition.* Boston: Harvard Business School Press.

Pine, B.J., Peppers, D. & Rogers, M. (1995). Do You Want to Keep Your Customers Forever? *Harvard Business Review*, (March-April) 103-114.

Plasmeijer, P.W.J., Hoekstra, J. & Van Raaij, W.F. (1999). Zoekende surfers en surfende zoekers (Dutch). *Tijdschrift voor Marketing*, (October) 1-3.

Poiesz, Th.B.C. & Van Raaij, W.F. (2002). *Synergetische Marketing. Een visie op oorzaken en gevolgen van veranderend consumentengedrag* (Dutch). Amsterdam: Pearson Education/Financial Times/ Prentice Hall.

Prahalad, C.K. & Ramaswamy, V. (2004). *The Future of Competition: Co-creating Unique Value with Customers.* Boston (MA): Harvard Business School Press.

Prasad, B. & Harker, P. (2000). Pricing Online Banking Services Amid Network Externalities. In: *Proceedings of the 33rd Hawaii International Conference on System Sciences.*

Proctor, R.M. & Burnett, P.C. (1996). Computer Attitude and Classroom Computers. *Computers in the School*, 12 (3), 33-41.

Rafaeli, S. (1988). Interactivity: From New Media to Communication. In: R.P. Hawkins et al., (eds.) *Sage Annual Review of Communication Research: Advancing Communication Science: Merging Mass and Interpersonal Processes*, 16, 110-134. Beverly Hills (CA): Sage.

Ravald, A. & Grönroos, C. (1996). The Value Concept and Relationship Marketing, *European Journal of Marketing*, 30 (2), 19-30.

Reichheld, F.F. (1993). *Loyalty-based Management.* Harvard Business Review, 71 (2), 64-73.

Reichheld, F. F. & Teal, T.A. (1996). *The Loyalty Effect: The Hidden Force Behind Growth, Profits, and Lasting Value.* Boston: Harvard Business School Press.

Reichheld, F.F. & Schefter, P. (2000). E-loyalty: Your Secret Weapon on the Web. *Harvard Business Review*, 78 (4), 105-113.

Reichheld, F.F. (2003). The One Number You Need to Grow. *Harvard Business Review* (December), 46-54.

Reinartz, W.J. & Kumar, V. (2002). The Mismanagement of Customer Loyalty. *Harvard Business Review*, 80 (7), 86-94.

Rowley, J. & Dawes, J. (2000). Disloyalty: A Closer Look at Non-loyals. *Journal of Consumer Marketing*, 17 (6), 538-549.

Rowntree, B.S. (1902). *Poverty: a Study of Town Life*. London: Nelson.

Rust, R.T., Zeithaml, V.A. & Lemon, K.N. (2000). *Driving Customer Equity: How Customer Lifetime Value is Reshaping Corporate Strategy*. New York: Free Press.

Ruyter, K. de (2000). *WWW.MMM (no pun intended) or the Reconstruction of Interactivity of Marketing*. Inaugural Speech at the University of Maastricht.

Schramm-Klein & Morschett, (2005). Multi-Channel Retailing. *Journal of Internet Banking and Commerce*, 10, no. 1. Retrieved from:
http://www.arraydev.com/commerce/jibc/2005-02/schramm-klein.htm

Seitz, J. & Stickel, E. (1998). Internet Banking - An Overview. *Journal of Internet Banking and Commerce*, 3 (1). Retrieved from http://www.arraydev.com/commerce/JIBC/9801-8.htm

Seybold, P.B. & Marshak, R.T. (2001). *The Customer Revolution*. New York: Crown Business.

Shani, D. & Chalasani, S. (1992). Exploiting Niches Using Relationship Marketing. *The Journal of Services Marketing*, 9 (3), 33-42.

Sheth, J.N. & Parvatiyar, A. (2002). Evolving Relationship Marketing into a Discipline. *Journal of Relationship Marketing*, 1 (1), 3-16.

Sheth, J.N. & Sisodia, R.S. (2002). Marketing Productivity: Issues and Analysis. *Journal of Business Research*, 55 (5), 349-362.

Sohn, C. & Lee, D. (2002). Trust to Build Customers' Loyalty in Internet Markets. *Decision Sciences Institute: Annual Meeting Proceedings*. Retrieved from
http://www.sbaer.uca.edu/Research/2002/dsi/papers/123.pdf

Spalter, M. (1995). Maintaining a Customer Focus in an Interactive Age. In: Forrest, E. & Mizerski, R. (Eds.) *Interactive Marketing: The Future Present American Marketing Association*, 163-188. Chicago.

Spencer, S. (2000). Mining for Sales in the E-mail Minefield. *Building Online Business* (Sept).

Spiliopoulou, M. (2000). Web Usage Mining for Websites Evaluation. *Communications of the Association for Computing Machinery*, 43 (8), 127-134.

Schramm-Klein, H. & Morschett, D. (2005). Multi-Channel Retailing. *Journal of Internet Banking and Commerce*. 10 (1). Retrieved from:
http://www.arraydev.com/commerce/JIBC/2005-02/schramm-klein.htm

Steuer, J. (1992). Defining Virtual Reality: Dimensions Determining Telepresence. *Journal of Communication*, 42, 73-93.

Storbacka, K., Strandvik, T. & Grönroos, C. (1994). Managing Customer Relationships for Profit. *International Journal of Service Sector Management*, 5 (5), 21-28.

Sweiger, M., Madsen, M.R., Langston, J. & Lombard, H. (2002). *Clickstream Data Warehousing*. New York: John Wiley.

Uncles, M. (1994). Do You or Your Customers Need a Loyalty Programme? *Journal of Targeting Measurement and Analysis for Marketing*, 2 (4), 335-50.

Van Meer, G.J.L. (2001). Financial Services via the Internet. In: *Proceedings of International Association Economic Psychology*, Bath.

Van Meer, G.J.L. & Van Raaij, W.F. (2004). A Suitable Research Methodology for Analyzing Online Banking Behaviour. *Journal of Internet Banking and Commerce*, 9, (1). Retrieved from: http://www.arraydev.com/commerce/JIBC/0402-04.htm.

Van Meer, G.J.L. (2006a). Customer Development and Retention on a Web-banking Site. *Journal of Interactive Marketing*, 20 (1) 58-64.

Van Meer, G.J.L. (2006b). To Understand Online Behaviour to Retain the Financial Customer. In: *Proceedings of the Financial Services & Insight Forum*, London.

Van Raaij, W.F., Van Veldhoven, G.M. & Wärneryd, K.E. (1988). *Handbook of Economic Psychology*. Dordrecht (Holland): Kluwer Academic.

Van Raaij, W.F. (1998). Interactive Communication: Consumer Power and Initiative. *Journal of Marketing Communications*, 4 (1), 1-8.

Van Raaij, W.F. (2000). *Economische Psychologie in de 21ste eeuw* (Dutch). An inaugural speech at University of Tilburg.

Van Raaij, W.F. & Poiesz, T.B.C. (2003). Rethinking the Value Concept in Marketing. In: Kitchen, P.J. (ed.) The Future of Marketing; Critical 21st-Century Perspectives (41-58). New York: Palgrave Macmillan.

Verhoef, P.C. (2004). Customer Lifetime Value, een overzicht van de literatuur. *Tijdschrift voor Economie en Management*, 49 (1), 79-104.

Walsh, J. & Godfrey, S. (2000). The Internet: a New Era in Customer Service. *European Management Journal*, 18 (1), 85-92.

Wiegran, G. & Koth, H. (1999). Customer Retention in Online Retail. *Journal of Internet Banking and Commerce*, 4 (1). Retrieved from http://www.arraydev.com/commerce/jibc/9909-07.htm

Wilson, C. (1985). *The Dictionary of Demography*. Oxford: Basil Blackwell Ltd.

Yaegal, T. (1987). Using Life Cycle Segmentation to Build an Effective Sales System. *Journal of Marketing Research*, 9, 53-62.

Yan, T., Jacobsen, M., Garcia-Molina, H., & Dayal, U. (1996). From User Patterns to Dynamic Hypertext Linking. In: *Proceedings of the Fifth International World Wide Web Conference*, Paris.

Zuboff, S. & Maxmim, J. (2003). *The Support Economy: Why Corporations Are Failing Individuals and the Next Episode of Capitalism*. London: Viking Penguin.
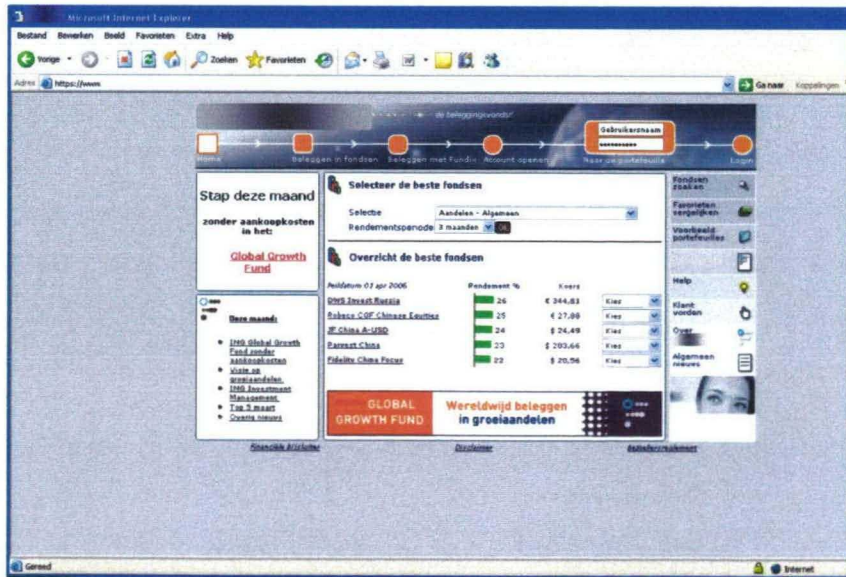
Resources

Forrester Research. *How Dutch Consumers Use Banking Channels*. Forrester Research paper by Ensor, B. & Van Tongeren, T. (2005). Retrieved from http://www.forrester.com/findresearch

Forrester Research. *Building Stronger Customer Relationships*. Forrester Research paper by Condon, C. (2006a). Retrieved from http://www.forrester.com/findresearch

Forrester Research. *Why Half of Europe's Net Users Don't Bank Online*. Forrester Research paper by Giovannini, E. & Ensor, B. (2006b). Retrieved from http://www.forrester.com/findresearch

Gartner Group. *Online Banking: A Strategic Perspective*. Context Overview Report by Starita, L. (1999). Retrieved from http://www.Gartner.com

NetGenesis. *E-Metrics - Business Metrics for the New Economy*. NetGenesis White paper by Cutler, M. & Sterne, J. (2000). Retrieved from http://www.targeting.com/emetrics.pdf.

TNS NIPO. *Research report 'Triple Play Consumers 2005'*.

Appendix: Screen dumps of the web-banking sites MO, SO and FO

◆ The homepage of 'Mortgages Online' (in Dutch) – screen dump on 21 April 2006:
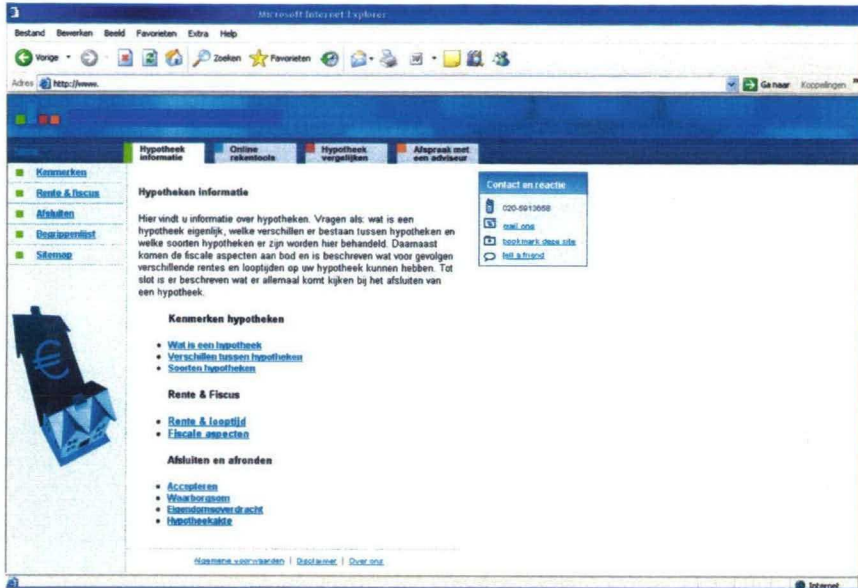
◆ The homepage of 'Stocks Online' (in Dutch) – screen dump on 21 April 2006:

♦ The homepage of 'Finances Online' (in Dutch) – screen dump on 26 April 2006:

Thank yous

I would like to thank my promotor Prof. dr. W.F. van Raaij for his guidance. His suggestions during our useful discussions were very valuable for writing my thesis.

Further I would like to thank Prof. dr. D. Sikkel and Prof. dr. T. Kuijlen for their reading of the thesis and for their helpful suggestions. I am also grateful to Prof. dr. Poiesz and to Prof. dr. R. Pepermans for participating in the promotion committee.

I would like to thank Achim Pelupessy for his comments on the manuscript. I also would like to thank Tom Breur for introducing me to the subject of clickstream analyses. His comments on the manuscript helped me finishing my thesis.

On the personal side I would like to thank my parents and my brothers for their support throughout the years. Dad, thanks for helping me with the Dutch summary. Last but not least, my special thanks to Chantal for her loving encouragements and being my best friend.

Geoffrey van Meer

Vita

Geoffrey (1974) was born and raised in Roosendaal (NL). He studied Psychology at the University of Leiden. He continued his study at the University of Tilburg, where he received a Doctorandus degree in Economic Psychology. His doctoral thesis was an empirical study investigating which psychological characteristics are relevant for financial behaviour on the Internet.

After graduating he started to work as a researcher at the research department of ING The Netherlands. He is involved in several research projects both market research and database research. He is working on issues as customer behaviour specifically online behaviour and clickstream analyses. He developed expertise in database analysis and predictive modelling.

Amsterdam, 2006

Samenvatting (Dutch summary)

Financieel gedrag op het internet

In het **voorwoord** zijn twee belangrijke ontwikkelingen in de huidige maatschappij beschreven. Ten eerste, een van de opmerkelijkste ontwikkelingen in het begin van de 21^e eeuw is de groeiende impact van de technologie op het consumentengedrag (Van Raaij & Poiesz, 2003; Davis & Meyer, 1998). De kranten berichten regelmatig over de groeiende populariteit van nieuwe technieken, maar ook over de risico's ten aanzien van de persoonlijke levenssfeer. De tweede maatschappelijke ontwikkeling is de trend naar individualisatie. Hiermee wordt niet zozeer een hedonistische maar een communicatieve individualisatie bedoeld. Zoals de huidige samenleving een toenemende individualisatie laat zien, vragen consumenten om een meer gepersonaliseerde benadering. Er is dus een groeiende behoefte aan producten en diensten, die aansluiten bij de persoonlijke kenmerken en wensen (Van Raaij & Poiesz, 2003). Als gevolg van nieuwe interactieve technologieën kunnen banken en/of financiële instellingen hun producten en diensten beter aanpassen aan de individuele behoeften van hun klanten. Een duidelijker beeld van het financiële gedrag van consumenten op het internet kan hierbij nuttig en waardevol zijn.

Zowel academici als marketing managers tonen een toenemende interesse in het beschrijven van het effect van het internet op het consumentengedrag. Er is echter nog weinig bekend over het financieel klantgedrag op het internet en over de relatie tussen de klant en de financiële dienstverlener via het internet. Dit proefschrift probeert praktische en bruikbare inzichten te verwerven in de gedragsaspecten ten aanzien van internet bankieren.

Hoofdstuk 1 stelt dat een belangrijke reden om consumentengedrag te bestuderen is dat het een grote rol speelt in ons dagelijks leven. De studie naar consumentengedrag beschrijft hoe men beslissingen neemt over wat men koopt, en waarom men het koopt. Door de vele technologische ontwikkelingen verandert het consumentengedrag, met als gevolg een toenemende consumptie via het internet. Met nieuwe interactieve media hebben consumenten nog meer invloed (Comer et al., 1999). Echter, ondanks de vele technologische mogelijkheden weten de meeste banken niet welke marketing acties zij moeten ondernemen om duurzame klantrelaties te creëren en te behouden via het internet. Zij gebruiken de websites als een zelfbedienings- en als een afzetkanaal voor eenvoudige transacties en/of

producten. De voordelen van het internet om interactief te communiceren met klanten worden niet benut. Daarnaast zijn de meeste banken niet in staat het individuele gedrag van consumenten op hun websites te analyseren. Banken en andere financiële instellingen hebben een bruibare onderzoeksmethodologie nodig die gedetailleerd inzicht geeft in het financiële klantgedrag op het internet. In het licht hiervan wordt het volgende onderzoeksprobleem geformuleerd:

"Op welke wijze kan het financiële klantgedrag op het internet geanalyseerd en begrepen worden, om duurzame klantrelaties op te bouwen via het internet".

Bovenstaand probleem is opgesplitst in vijf deelvragen:

♦ hoofdstuk 2: is er een bruikbaar conceptueel denkraam om het longitudinale gedrag op het internet te begrijpen?

♦ hoofdstuk 3: is er een bruikbare onderzoeksmethodologie om het gedrag op het internet te analyseren?

♦ hoofdstuk 4: hoe analyseer je het klantgedrag op een website voor internet bankieren?

♦ hoofdstuk 5: hoe identificeer je klantontwikkeling en klantbehoud op een website voor internet bankieren?

♦ hoofdstuk 6: is er een relatie tussen klanttevredenheid, loyaliteit en winstgevendheid op een website voor internet bankieren?

De 'customer life cycle (CLC)' is een bruikbaar conceptueel denkraam om het longitudinale gedrag op het internet te begrijpen.
In **hoofdstuk 2** wordt een conceptueel denkraam beschreven om het longitudinale financiële klantgedrag op het internet beter te begrijpen.

De ontwikkelingen van het klantgedrag op het internet zijn weergegeven in de 'customer life cycle' (zie figuur A). De CLC, ookwel klantcarrière, is een conceptueel denkraam dat veranderingen in klantgedrag in de tijd weergeeft. Naarmate de relatieduur toeneemt, wordt de klant loyaler en neemt ook de winstgevendheid van de klant (klantwaarde) toe. Uiteraard kan een individuele CLC worden verkort, doordat klanten weglopen (attritie). De termen 'creëren' en 'behouden' zijn afkomstig van de direct-marketing definitie en zijn toegevoegd aan de CLC.

Figuur A   Customer life cycle (CLC)
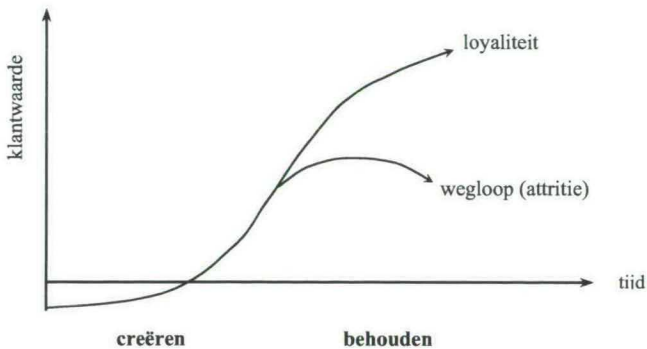
Volgens de direct-marketing strategie moeten financiële dienstverleners de gevraagde dienstverlening aanbieden om klantrelaties te creëren en te behouden. Met de toevoegingen van de direct-marketing concepten, 'creëren' en 'behouden' van klantrelaties', aan de CLC, hebben banken en financiële instellingen een beter inzicht in de klantrelaties op een website voor internet bankieren. Binnen dit denkraam zijn er verschillende mogelijkheden om het klantgedrag te beïnvloeden en de winstgevendheid van de klant te optimaliseren. De interactieve mogelijkheden van internet bankieren helpen bij het opbouwen en het behouden van de klantrelaties. Het behouden van klantrelaties moet ook deel zijn van de marketing strategie. Het doel van de marketing strategie is dat de klant terugkomt naar de website en een loyale klant wordt. Een website moet een lange termijn 'stickiness' bewerkstelligen. Het moet tevens een financiële drempel creëren dat klanten ontmoedigt om over te stappen naar de concurrentie (Nemzow, 1999). Met de CLC hebben financiële dienstverleners een bruikbaar denkraam in handen, waarmee zij nieuwe klanten kunnen sturen en waarmee zij eventueel kunnen interveniëren in onwenselijk gedrag van bestaande klanten.

Clickstream onderzoek is een bruikbare onderzoeksmethodologie om het gedrag van klanten op het internet te analyseren.
In **hoofdstuk 3** wordt een onderzoeksmethodologie beschreven om het gedrag van klanten op het internet te analyseren.

De meeste banken hebben nog geen instrument om het individuele gedrag van consumenten op het internet te analyseren. Voor hen is het internet een 'black box' waarin men geen inzicht heeft in het online gedrag van hun klanten. Banken en andere financiële

instellingen hebben een bruibare onderzoeksmethodologie nodig dat de black box opent en licht laat schijnen op het online klantgedrag.

Clickstream onderzoek is een geschikte onderzoeksmethodologie om het individuele online gedrag te analyseren. De clickstream data zijn objectief verzameld, zijn gebaseerd op geobserveerd clickgedrag en bevatten een tijdspatroon. Clickstream data weerspiegelt het online klantgedrag op micro-niveau; per (milli)seconde wordt het online klantgedrag vastgelegd. De gedetailleerde gegevens van het online klantgedrag geven de onderzoekers en de marketing managers de mogelijkheid het gedrag te analyseren. Eventueel kunnen de clickstream data worden verrijkt met gegevens uit de marketing database. Clickstream onderzoek kan fungeren als een optimalisatie-instrument voor websites (zie hoofdstuk 4) en als een instrument om het klantgedrag te sturen ten behoeve van marketing acties (zie hoofdstuk 5).

Met behulp van analyse van clickstream data kan het klantgedrag op een website voor internet bankieren worden onderzocht.

Op basis van de beschreven onderzoeksmethodologie (clickstream onderzoek) in hoofdstuk 3 zijn in **hoofdstuk 4** enkele toepassingen van analysetechnieken op financieel klantgedrag op het internet beschreven.

Door onderzoek op clickstream data is het mogelijk om een scherpe analyse te maken van het individuele gedrag op het internet. In de statistiek bestaat er een breed scala aan analysetechnieken, bijvoorbeeld regressie-analyse of clusteranalyse. In dit hoofdstuk is een voorbeeld van een onderzoek op clickstream data van een financiële instelling in Nederland opgenomen. Via deze website kunnen bezoekers onder andere informatie vinden over verschillende hypotheekvormen; zij treffen er rekeninstrumenten aan om bijvoorbeeld de maximale hypotheeklasten of de netto maandlasten te berekenen. Ook kunnen zij door middel van een aanvraagformulier een gratis adviesgesprek aanvragen. In het clickstream onderzoek zijn vier toepassingen uit de praktijk beschreven:

♦ het meten en volgen van algemeen website bezoek
♦ het ontdekken en volgen van belangrijke succesfactoren, ookwel 'key performance indicatoren (KPI)' genoemd
♦ het analyseren van de relatie tussen het online bezoekersgedrag en KPIs
♦ het segmenteren (clusteren) van sessies van bezoekers

Deze toepassingen zijn voorbeelden van analysetechnieken, die tevens bewijzen dat clickstream onderzoek fungeert als:

(1) een monitor voor een systeem van KPIs; en

(2) een instrument waarmee de structuur en inhoud van de website kan worden verbeterd. Clickstream onderzoek blijkt een bruikbare onderzoeksmethodologie te zijn om inzicht te krijgen in het klantgedrag om daarmee een website te optimaliseren.

Met behulp van clickstream onderzoek kan de ontwikkeling van klanten op een website voor internet bankieren worden gevolgd (monitoren).

Op basis van het conceptueel denkraam in hoofdstuk 2 ('customer life cycle') en de onderzoeksmethodologie in hoofdstuk 3 (clickstream onderzoek), worden in **hoofdstuk 5** enkele toepassingen van analysetechnieken op de ontwikkeling van online klantgedrag in de tijd beschreven.

Het is van belang om het individuele klantgedrag te volgen en te evalueren. Bedrijven die hun klantinformatie niet op orde hebben, verliezen de greep op hun klanten. Ook financiële dienstverleners streven ernaar om duurzame klantrelaties op te bouwen. Hiervoor moeten zij klanten kunnen herkennen, die zich in de loop van de tijd ontwikkelen tot loyale klanten. In dit hoofdstuk is een clickstream onderzoek naar de ontwikkeling en behoud van klantrelaties op een website voor internet bankieren van een financiële instelling in Nederland opgenomen. Op deze website kunnen bezoekers onder andere informatie vinden over verschillende internationale aandelenopties. Tevens kunnen bezoekers via de website zich aanmelden en vervolgens als klanten op de website de opties kopen en verkopen. Het blijkt dat clickstream onderzoek geschikt is om de ontwikkeling van het online gedrag van bezoekers en geregistreerde klanten te onderscheiden:

- in tegenstelling tot bezoekers laten klanten een duidelijke toename in online activiteit (aantal sessies) zien gedurende de eerste weken op de website.
- wat betreft het type clickgedrag (welke pagina's), verschillen klanten van bezoekers gedurende de eerste weken op de website. Tevens blijkt dat het type clickgedrag een voorspellende waarde heeft of een klant wel of niet een actieve en loyale klant wordt.

Door identificatie van potentiële loyale klanten draagt clickstream onderzoek bij aan het inzicht in de ontwikkeling van klantrelaties. Het blijkt overigens dat het erg moeilijk is om attritie (weggloopgedrag) in de laatste weken van de klantrelatie te voorspellen. Misschien zijn websites succesvol in het aantrekken van bezoekers, maar nog niet in het vasthouden ervan,

zodat ze iets kopen en loyale klanten worden (Agrawal et al., 2001). Op grond van clickstream onderzoek zouden banken een waarschuwingssysteem moeten implementeren. Hiermee kunnen ze iedere negatieve verandering in het gedrag van potentiële weglopers vroegtijdig signaleren. Klanten die minder frequent de website bezoeken, kunnen benaderd worden om dit negatieve gedrag te onderbreken en wenselijk gedrag te stimuleren.

Tevreden klanten die bereid zijn hun website aan te bevelen aan derden, zijn ook de winstgevende klanten.

In **hoofdstuk 6** wordt de relatie tussen tevredenheid, loyaliteit en winstgevendheid van de klant op een website voor internet bankieren beschreven.

Klanten met een lange relatieduur met hun bank zijn in het algemeen tevreden met en tevens loyaal aan hun bank. Echter, niet alle klanten met een lange relatieduur zijn winstgevend voor de bank. Dat geldt wellicht niet op het internet, waar de mogelijkheden voor klanten om weg te lopen snel en gemakkelijk is. In dit hoofdstuk is een marktonderzoek naar tevredenheid, loyaliteit en winstgevendheid van klanten op een website voor internet bankieren van een financiële instelling in Nederland opgenomen.

Er kon echter geen relatie tussen de online klanttevredenheid en de -winstgevendheid worden aangetoond. Wel kon de relatie tussen de intentie van de klant om de website aan te bevelen aan derden en de winstgevendheid van deze klant worden aangetoond. Echter, als een klant de intentie heeft de website voor internet bankieren aan te bevelen aan derden, dan is hij of zij waarschijnlijk ook wel tevreden over de website. Banken zouden moeten proberen tevreden klanten te vinden die bereid zijn hun website aan te bevelen aan derden.

Tot slot worden in **hoofdstuk 7** enkele aanbevelingen voor toekomstig wetenschappelijk onderzoek alsmede voor de financiële dienstensector beschreven. De eerste aanbeveling voor de wetenschap betreft onderzoek naar de mogelijkheden van allerlei andere statistische analysetechnieken, zoals tijdreeksanalyse of survivalanalyse, op clickstream data. Ook het onderzoek naar de relatie tussen psychologische factoren, zoals 'internet attitude' of 'self-efficacy', en clickgedrag is een interessante aanbeveling. De derde aanbeveling voor de wetenschap betreft het onderzoek naar welk familielid binnen het huishouden een relevante rol speelt in het aankoopproces van financiële producten op het internet.

De aanbevelingen voor de financiële dienstensector zijn zowel gebaseerd op het literatuuronderzoek als op het empirisch onderzoek. De eerste aanbeveling is gericht op het belang van 'interactiviteit' van de website voor internet bankieren. Interactiviteit is de sleutel

om internet bankieren te integreren in de direct-marketing strategie van een bank. Daarnaast wordt het belang van 'personalisatie' van de website benadrukt. De eerste aanbeveling op grond van het empirisch onderzoek richt zich op het integreren van clickstream onderzoek in het marketing proces. Clickstream data blijkt een rijke bron aan informatie over klantgedrag te zijn. Deze gegevens moeten worden gekoppeld aan de gegevens in de marketing database. Daarnaast moeten banken het gedrag, de tevredenheid, loyaliteit en winstgevendheid van haar klanten gedurende de CLC monitoren. Het is belangrijk om type klantgedragingen te (h)erkennen op verschillende momenten in de loop van de tijd. Hiermee kunnen klanten periodiek worden gesegmenteerd en eventueel worden geselecteerd voor marketingacties.

Tot slot, als de technologische ontwikkeling in combinatie met de trend naar individualisatie zich voorzet, wordt de behoefte aan nieuwe mogelijkheden om het online gedrag te analyseren en te modelleren groter. Op dit moment staan de meeste banken en andere financiële instellingen nog aan het begin van het onderzoek naar klantgedrag op het internet. Echter, de verwachtingen van klanten zijn sterk toegenomen. Zij verwachten 'state-of-the-art' technologische innovaties van grote bedrijven, die elk jaar miljoenen euro's winst maken. Banken en andere financiële instellingen hebben de uitdaging deze hoog-gespannen verwachtingen waar te maken en de klanttevredenheid ten aanzien van dienstverlening via het internet te verhogen.