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“Not Eternal Love but Differentiation”

About the Possibilities for Optimizing Business of Paid Services on Dating Websites

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ABSTRACT

Customers are increasingly demanding for paid services on the Internet, supplementing as well as cannibalizing on existing services. While there is a growing amount of scientific literature concerning the economics of the Internet and paid services empirical studies are scarcely to be found. This paper discusses research in the field of price and product differentiation concerning paid services for dating websites. Considering the literature and examining a huge data base two hypotheses are deployed to highlight the willingness to buy and willingness to pay in this evolving field.

Keywords

willingness to pay, willingness to buy, paid services, price and product differentiation, bundling, dating websites.

INTRODUCTION

Digital services used to be free on the electronic markets. The service providers' main source of revenues was advertising. In the wake of the Internet spending bubble the subsequent consolidation and the substantial decline of advertising revenues many firms adjusted their business models and began to sell digital services which had been free of charge by that time. The fact that consumers suddenly had to pay for these digital services required a change of consumer behavior and led to a paradigm shift.

This paradigm shift is characterized by increased execution of social functions by means of interactive information and communication technologies (ICT). Thus, one can speak of a digital information society. There seems to be a development towards value adding services. Websites emerge, which make social interaction possible, as for instance “social networking” or “the internet as a matchmaker” (Siegle, 2004, 63). The change, however, which was triggered by the emergence of the Internet goes far beyond a mere simplification of everyday tasks. A further characteristic, the influence of the Internet on human life, can for example be found in the increasing misalignment of social interaction by means of interactive information technologies.

Online dating services are not a new phenomenon. People got to know each other in Usenet, chats, web forums and other meeting places on the Internet a long time before online dating services were available (Kleinz, 2004).

The increasing importance of Internet platforms which allow users to socialize, can be seen from the impressive dissemination of this kind of services. Searching Yahoo and Google for the term “matchmaking” returns over 2,250,000 and 3,940,000 hits, respectively (January 19, 2005). According to Jupiter Research online dating services are generating the biggest turnover of all internet services (Greenspan, 2003). Thus, a certain relevance of this topic can be claimed.

By transforming from a niche to a mass market online dating became an increasingly important advertising channel at once, opening up a substantial financial source for the industry. Taub adds “The Internet has become a widely popular forum for dating, becoming big business, as evidenced by the significant increase of online ads for dating sites in the past few years” (Nielsen and NetRatings, 2003, 2). As a consequence the increasing acceptance of these kind of websites leads to an emerging field for paid services, given the increasing willingness to pay for premium services.

Digital services such as economic goods have special characteristics. Analogous to information goods digital services have three main properties that can cause difficulties in market transactions: (i) digital services are experience goods (“You must experience an information good before you know what it is”), (ii) they have economies of scale (“Information typically has a high fixed cost of production but a low marginal cost of reproduction”) and (iii) they have the characteristics of public goods (“Information goods are typically non-rival and sometimes non-excludable”) (Varian, 1998, 2001). These properties may

influence the consumer behaviour and the willingness to pay for digital services.

The change of consumer behavior, the paradigm shift and the economic properties of digital services lead to the following research question:

How do price- and product differentiation affect the willingness to pay for paid services on dating websites?

The paper is structured as follows. The following section will give an overview concerning the literature on product and price differentiation, disposition to buy and willingness to pay, service bundling and versioning. Based on these theories different hypotheses will be derived and tested empirically. In the last section we discuss the impact of the empirical findings on the existing theories and the implications of these empirical findings.

RELATED LITERATURE

Digital services

The integration of the customer in the process is absolutely central for the provision of digital services. Meyer concretizes this by the fact that services are not available for free on the market; the customer retains the property right and is at the same time subject of the service (Meyer 1994, 9). If the customer is actively involved in the process, as for example in connection with an advisory service, then he participates actively in the provision of the service. In that respect and in order to describe the particular position of the consumer, the term “prosumer” is rapidly gaining in acceptance in the scientific literature. “Prosumer” is a composition of the two words “producer” as well as “consumer”. The customer is thus a co-producer and consumer in one person. His behavior has a direct impact on the quality of the service (Meyer and Blümelhuber, 1994, 9). As far as dating services are concerned, the quality of a profile is absolutely crucial for successful matching.

Starting from the basic idea “service” and the various definitions in the scientific literature, it is now necessary to analyze the term “digital service” in detail.

According to Brandtweiner, digital goods are those which are digital in shape, therefore coded as quantity of bits and bytes and which are supplied by a network infrastructure, e.g. software (Brandtweiner, 2000, 37). There is a substantial difference between digital goods and information goods, which contain information, or in other words data about circumstances and procedures (Hansen and Neumann, 2001, 8).

A more complex view on the definition “digital goods” is given by Choi, Stahl and Whinston. According to their description the term “digital product” contains all real assets and services, which are sold over the Internet (Choi et al., 1997, 62).

category	specification
Information and entertainment products	<ul style="list-style-type: none"> • Paper-based information products: newspapers, magazines, journals, books • Product information: product specifications, user manuals, sales training manuals • Graphics: photographs, postcards, calendars, maps, posters • Audio: music recordings, speeches • Video: movies, television programs
Symbols, tokens and concepts	<ul style="list-style-type: none"> • Tickets and reservations: airline, hotels, concerts, sport events • Financial instruments: checks, electronic currencies, credit cards, securities
Processes and services	<ul style="list-style-type: none"> • Government services: forms, welfare payments • Electronic messaging: letters, faxes, telephone calls • Business value creation processes: ordering, bookkeeping, inventorying, contracting • Auctions and electronic market • Remote education, telemedicine and other interactive services • Cyber cafés and interactive entertainment

Table 1. Characteristic of digital goods according to Choi et al. (source Choi et al. 1997)

The table above shows a systematic classification of digital goods according to Choi, Stahl and Whinston (1997). The definition of “digital goods” according to Brandtweiner and Choi *et al.* covers substantially more goods than just “digital services”.

However, Brandtweiner (2000) is critically attuned to the systematics of Choi et al. It seems to be plausible on the one hand, but arbitrarily selected on the other (Brandtweiner, 2000). There is no organization according to a higher logic apparent.

“Digital services” and “online services” are terms which are usually synonymously used in publications in electronic markets and in E-Commerce. A definition of digital services can be found in de Ruyter (2001). De Ruyter defines “electronics services” as “(...) an interactive, content-centered and Internet-based service, driven by the customer and integrated with related organizational customer support processes and technologies with the goal of strengthening the customer-service provider relationship” (de Ruyter et al., 2001).

Stahl and Siegel define digital service as “...a service that is completely or substantially available for direct applications in an electronic medium. The value of the service exists in the right of the usage.” Usability, applicability and recoverability but not their exchangeability are the features of digital services (Stahl and Siegel, 2004).

Consequently, electronic trade of digital services is clearly to be defined according to the above mentioned product properties and the differences to the E-Commerce of digital contents. In this paper e-commerce of digital services and in particular dating services is being analyzed exclusively, in contrast to the e-commerce of digital contents, which shall not be subject of this paper.

Price and Product Differentiation

Due to decreasing average costs and low marginal costs suppliers of digital services on dating websites have high incentives to differentiate their offers to minimize the substitutability and competition between identical services. Differentiation of prices and products is a central method to discriminate between consumers. Types of price differentiation of digital services are quantitative or qualitative price differentiation, bundling or versioning (e.g. by means of quality). “Quality variation may take the form of offering a degraded quality in order to sell to the low end of the market while still maintaining revenue from the high end of the market. Such quality variation can generate additional revenue to cover costs as well as increasing access to the good making all parties to the transaction better off” (Varian, 1998, 2001).

Since the consumer’s willingness to pay for paid services on dating websites is heterogeneous, suppliers have the possibility to differentiate their prices and to discriminate between consumers. “Differentiated markets are commonplace because buyer preferences are heterogeneous for most types of products. Furthermore, these markets are attractive to sellers because they offer substantial profit opportunities” (Bakos, 1991a). As the preferences of customers vary it is essential to differentiate prices and products to raise revenues and benefits (Diller, 2000). It is important that differentiation is based on the customer’s value proposition and customer’s benefit. Accordingly, different theoretical forms of price discrimination and different forms of price differentiation emerged in practice. “The issue of price differentiation is rather similar to the much studied issue of price discrimination. Price discrimination refers to the ability to charge different consumers differently, whereas price differentiation refers to the ability to charge differently for differently goods” (MacKie-Mason *et al.*, 1996).

Price discrimination through product differentiation raises the competitive power of suppliers as the digital product will be differentiated according to its characteristics. Product differentiation is used when the quality of the product can be differentiated in the same tenor (Diller, 2000:301). “Any set of commodities closely related in consumption and/or in production may be regarded as differentiated products” (Eaton and Lipsey, 1989). According to Choi, Stahl and Whinston product differentiation exists if products are of the same product category but are not identical (1997:315). “Differentiated products are classified in the same product group, yet they are not identical” (Choi *et al.*, 1997:315).

Willingness to pay

In connection with paid services on dating websites suppliers do not have any knowledge or chance to gain knowledge of the consumers’ willingness to pay. Therefore suppliers use the mechanism of second degree price discrimination (Pigou, 1920, 2001). “A second degree would obtain if a monopolist were able to make n separate prices, in such a way that all units with a demand price greater than a x were sold at a price x , all with a demand price less than x and greater than y at a price y , and so on” (Pigou, 1920, 2001:279).

The personalized pricing strategy can increase the value of a product for the customer. Price and product differentiation are mechanisms to personalize digital products and to raise the value from a customer’s perspective because these mechanisms are based on customer’s value proposition and customer’s benefit.

By using a second degree price discrimination products are differentiated in a way that different consumers segments purchase at different prices although consumers are free to choose any product at any price. Consumers with a high willingness to pay purchase at higher prices than consumers with a low willingness to pay (Diller, 2000). Consumers can be divided into individual consumer segments according to their willingness to pay. Thus, second degree price discrimination is also called price discrimination with “self-selection”. Non-linear pricing is an example of second degree price discrimination because in these pricing models the price depends on the amount of products or services bought (e.g. quantity discounts).

Figure 1 illustrates the difference in relation to the absorption or non-absorption of willingness to pay and consumer surplus by using a linear price-consumption curve. The more segments are created the merrier is the chance of suppliers to skim willingness to pay and consumer surplus (Simon, 1992:388).

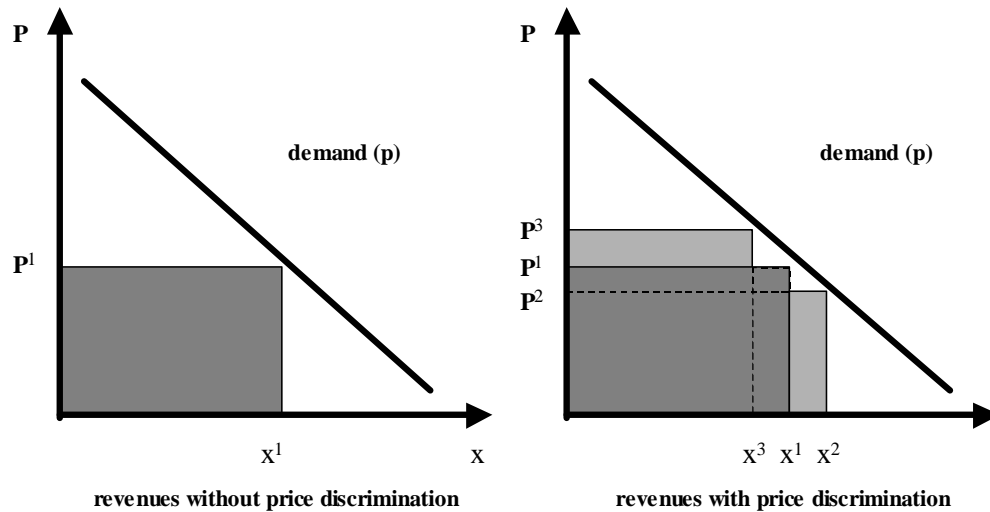


Figure 1. Revenues and Price Discrimination

Service Bundling

The main idea of bundling is to reduce the variance of a customer's value proposition and a customer's willingness to pay for digital goods in comparison to unbundled sales. The theoretical outlook divides various techniques of product and service bundling as bundling, mixed/optimal bundling or mixed components.

Though being technically possible, selling digital services separately might not always be a profit-maximizing strategy. Bundling, which is a special form of price discrimination, can be a more efficient way to sell digital services. Using a standard one product demand function, the consumer surplus and the deadweight loss can be easily derived. The deadweight loss could be avoided only if the price was set equal to marginal cost, which is as already described not optimal or even feasible in a market for digital goods with prices near or equal zero. Any price set above the marginal cost, however, creates a deadweight loss.



Figure 2. Quantity for bundle as a fraction of total population (Source: Bakos and Brynjolfsson, 1996, 1999)

Bundling provides a way of solving this dilemma. Looking at the demand function for a two service bundle, with each of the services being valued independently by consumers on a scale from [0;1] e.g. setting the price accordingly, the following effect on the demand curve can be observed. The bundle of the two goods is being valued on a scale of [0;2]. The area below

the combined demand curve equals the two areas below each of the single product demand curves, but the slope changes, being more elastic around the median and less elastic at each end of the interval. Adding more services to this bundle expands this effect, as can be seen in a 20 service bundle demand curve. With more services being added to the bundle, the median utility for consumers is concentrated around the median price of the bundle. An optimal pricing strategy can be derived from this effect, which is described in detail by Bakos and Brynjolfsson (1999) who show that the profit derived from bundling diverse services grows the bigger a bundle is because “the law of large numbers assures that the distribution for the valuation of the bundle has an increasing fraction of consumers with “moderate” valuations near the mean of the underlying distribution, [...] the demand curve becomes more elastic near the mean and less elastic away from the mean” (Bakos, Brynjolfsson 1999:5). Bakos and Brynjolfsson (1996) analyze optimal strategies for a monopolist offering multiple products and show that the profit and consumer valuation of large bundles dominates small bundles of information goods. They found that bundling a large number of unrelated information goods could be “surprisingly profitable”. In their approach they consider “a setting with a single seller providing n information goods to a set of consumers Ω . Each consumer can consume either 0 or 1 units of each information good, and resale is not permitted (or is unprofitable for consumers). For each consumer $\omega \in W$, let $v_{ni}(\omega)$ denote the valuation of good i , when a total of n goods are purchased” (Bakos and Brynjolfsson, 1996:3f).

The valuation of good i depends upon the number n of goods purchased, so that the distribution of valuations for individual

$$x_n = \frac{1}{n} \sum_{k=1}^n v_{nk}$$

goods changes with n . The per-good valuation of the bundle can be described by

Bakos and Brynjolfsson (1996, 1999) assume that the following conditions hold:

A1: The marginal cost of copies of all information goods is zero to the seller.

A2: For all n , consumer valuations v_{ni} are independent and uniformly bound, with continuous density functions, non-negative support, mean μ_{ni} and variance σ_{2ni} .

$$\sum_{k=1}^n v_{nk} \geq \sum_{k=1}^{n-1} v_{(n-1)k}$$

A3: Consumers have free disposal. In particular, for all $n > 1$,

If A1, A2 and A3 hold, selling a bundle of all information goods n can be remarkably superior to selling goods separately; the profit of bundling grows, the bigger the bundle is because “as n increases, the seller captures an increasing fraction of the total area under the demand curve, correspondingly reducing both the deadweight loss and the consumer surplus related to selling the goods separately.”

Reflecting these theoretical approaches, price- and product differentiation, service bundling and willingness to pay are strongly interrelated. Service bundling and non-linear segmentation as devices of product- and price differentiation have the goal of skimming consumer surplus. Based on the described models the following hypotheses can be derived:

H1: Product differentiation in the form of service bundling raises the willingness to buy

H2: Price differentiation according the size of service bundles raises the willingness to pay

EMPIRICAL ANALYSIS OF PAID SERVICES OF DATING PLATFORMS

Data

The hypotheses for the willingness to pay for paid services on dating websites were tested on a set of data from the German payment provider FIRSTGATE, which is the leading micropayment provider in Germany, with 2,600 suppliers of paid content and paid services and 2.9 million registered users. FIRSTGATE click&buy™ is a micropayment system where users register only once in order to be able to buy paid content or services from all suppliers, who settle their digital goods with this system. At the end of the month customers get only one bill from FIRSTGATE where all purchases are listed. Due to this mechanism the dataset contains not only data from individual supplier or customer but from a whole market.

A sub-sample of 12 dating websites was drawn for the empirical analysis, the extraction criterion being that each dating website offers some of their services with costs. This sample consist of 98,788 purchase transactions made by 48,080

customers in the period from October 2000 to September 2004, representing all the dating websites' purchase transactions in the given period. Additionally, we collected data about the total number of registered users and the different service bundles which are offered on the observed dating websites.

The sample of these 12 dating websites suppliers and the type of bundling or splitting of digital services is listed in Table 2.

Supplier	Number of registered users	Service Bundling
friendscout24.de	2,200,000	Yes
Icony.de	100,000	Yes
Metropolis.de	800,000	Yes
love.de	212,303	No
find2gether.de	125,000	No
myflirt.de	250,000	YES
Bildflirt.de	120,440	No
Flirtnest.de	100,000	Yes
Firststaffair	40,000	Yes
Love-Community.net	13,893	Yes
Meetic.de	9,000,000	Yes
Ffnflirtline.de	117,440	No

Table 2. List of analyzed dating websites

Methodology and Results

The analysis of the data was performed in several steps. Firstly, the relationship of the number of users who are registered on the different dating websites and the number of users who consumed paid services on these websites was computed.

Table 3 shows that on dating websites which offer their paid services as a service bundle the share of users who consume paid services is much higher.

	Dating websites with paid service bundles	Dating websites offering only paid services separately
Number of observed dating websites (absolute)	8	4
Share of users who consume paid services (average)	0.018238	0.005946

Table 3: Indicators about the effect of product differentiation on dating websites

In order to analyze the direction and magnitude of the influence of service bundling on the buying and consumer behavior, several correlation coefficients were computed. In Table 4 the correlation coefficients between the number of registered users respectively offered services bundles and the number of users who consume paid services respectively the number of purchase transactions are listed.

Correlation coefficient	Number of users who consume paid services	Number of purchase transactions
number of registered users	0.5565	0.4350
Service Bundles	0.3754	0.5079

Table 4: Correlation Coefficients

Table 4 shows that the correlation coefficient between the number of registered users and the number of users who consume paid services and the number of purchase transactions is positive as well as the correlation coefficient between dating websites which offer services bundles and the number of users who consume paid services and the number of purchase transactions is positive.

The results in Tables 3 and in table 4 indicate a strong relationship between the buying and consumer behaviour and service bundling. To analyze the significance of these relationships the ANOVA was computed. The “Analysis of Variance” is a method which analyzes the effect of one or several independent variables (e.g. the kind of bundling or splitting) in relation to one dependant variable (e.g. revenues or transaction volume per million visits) (Backhaus et al., 2003). To analyze the relationship for each of the dependant variables “number of users who consume paid services” and “number of purchase transactions” a one-way ANOVA was computed with bundling/splitting as the independent variable.

Number of observations = 16			R-squared = 0.1410		
Root MSE = 9129.55			Adj R-squared = 0.183		
Source	Partial SS	df	MS	F	Prob > F
Model	95777413.4	2	95777413.4	1.15	0.3193
Service bundle	95777413.4	2	95777413.4	1.15	0.3193
Residual	583441408	11	83348772.6		
Total		15			

Table 5: Anova: Impact of service bundling on the number of users who consume paid services

Number of observations = 16			R-squared = 0.2796		
Root MSE = 15927.8			Adj R-squared = 0.1896		
Source	Partial SS	df	MS	F	Prob > F
Model	787836012	2	787836012	3.11	0.1161
bundlingtyp	787836012	2	787836012	3.11	0.1161
Residual	2.0296e+09	11	253694472		
Total		15			

Table 6: Anova: Impact of service bundling on the number of purchase transactions

As shown in Tables 5 and 6 a significant influence of service bundling on the number of users who consume paid services as well as the number of purchase transactions can be identified.

To analyze the second hypothesis we analyzed only websites with service bundles. Analysis of the data was performed in several steps. First of all we computed the average decrease of the price per unit between two segments. In a second step the number of registered users who consume paid services on a dating website (according the number of segments) was calculated.

Table 7 shows the number of purchase transactions and the revenues per registered user who consumed paid services. Whereas the number of purchase transactions per registered user is lower on dating websites with a stronger price differentiation the revenues are significantly higher on dating websites with a higher segmentation.

Supplier's number of segments	Decrease of price per unit (average)	Share of registered users who consume paid services	Purchase transactions per registered user who consume paid services	Revenues (in €) per registered user who consume paid services
3 segments	-41,19%	0.14%	1,799	20,43 €
4 segments	-15,25%	3.04%	1,487	36,13 €
Average		2.21%	1,5077	34,35 €

Table 7: Indicators of price differentiation according to the supplier's number of segments

Analogous to product differentiation several correlation coefficients were computed (see Table 8). The values in Table 8 show a strong positive correlation between the decrease of price per unit and the revenues per registered user. Surprisingly the correlation coefficient between supplier's number of segments and the number of purchase transactions is weak negative which means as higher the prices are differentiated as lower the number of purchase transactions.

Correlation coefficient	Number of purchase transactions	Revenues per registered users
Supplier's number of segments	-0.0471	0.1086
Decrease of price per unit (average)	0.2384	0.4196

Table 8: Correlation Coefficients

The different statistics fully support the conclusion that service bundling as a device of product differentiation and non-linear segmentation as a device of price differentiation on dating websites raises significantly the willingness to buy and the willingness to pay. In the following section the empirical results will be discussed in the context of the hypotheses and the theoretical approaches.

DISCUSSION AND IMPLICATIONS

Firstly, in the four year period analysed, only 1.83% and 0.59% of registered users in the two groups purchased paid services (see Table 3). The significant conclusion has to be either a high proportion of users are totally inactive and/or a very high proportion of users exhibit consumer behaviour which is perfectly price inelastic at a price level of zero. Therefore price- and product differentiation doesn't affect the willingness to pay for paid services on dating websites, because most of the users has a willingness to pay of zero for paid services on dating websites.

Due to the bundling theory of products and services the techniques of product and price differentiation enable the reduction of the variance of value proposition and increase the willingness to pay in comparison to unbundled sales of products and services. As presented in the last section from a theoretical point of view, service bundling and willingness to *buy* as well as service bundling and willingness to *pay* are closely related.

The empirical results in Tables 3 and 4 show that the share of users who consume paid services on dating websites is much higher in case the suppliers offer services as bundles. Additionally, the number of registered users and the number of users who consume paid services as well as the number of purchase transactions are strongly correlated (see Table 4). This means that bundling as a device of product differentiation affects and increases the willingness to buy. The empirical results show that bundling reduces the variance of willingness to pay and increases the willingness to buy for paid services on dating websites and are a strong indicator that the theory of bundling also works in the context of paid services on dating websites. Therefore, the current behavior of consumers does comply with Hypothesis 1.

The previous section showed that segmentation as a form of price differentiation has an impact on the willingness to pay. As

mentioned above the more segments are created the merrier is the chance of suppliers to skim willingness to pay and consumer surplus (Simon, 1992:388). The empirical results in Tables 7 and 8 show that a major segmentation of the paid service offers leads to an increase of registered users on dating websites who consume paid services. Additionally, the revenues per registered user who consumes paid services are much higher if the supplier offers the services in four versions instead of three versions. The correlation coefficients in Table 8 fully support a positive interrelation of the supplier's number of segments and the revenues per registered user. Furthermore, a higher decrease of the price per unit between two segments leads to an increase of the number of purchase transactions and revenues per registered user – the correlation coefficients are strongly positive (see Table 8). This means that price differentiation increases the willingness to pay for paid services on dating websites if the willingness to pay is greater than zero. Hypothesis 2 cannot be rejected.

The main implication of these observations is that price and product differentiation works and raises the willingness to pay for paid services on dating websites – but only if the willingness to pay is greater than zero.

CONCLUSION

This paper shows that in the context of the economic properties of digital services price and product differentiation raises the willingness to pay for paid services on dating websites. In this paper it is shown that bundling theories – especially the approach of Bakos and Brynjolfsson (1996, 1999) – seem to work within dating websites. The revenues of bundled paid services outperform the online revenues of splitted paid services.

It is shown that suppliers of dating websites are able to maximize revenues when selling digital services by providing different bundles to consumers or applying non-linear segmentation. However, these bundles or pricing schemes need to be designed correctly in order to induce consumers to increase their spending. This should be done by concentrating on the quantity provided to the consumer, as the consumer seems to respond more to a change in quantity than a reduction in the price per unit. As marginal costs of digital services are generally small or even zero increasing quantity at a lower per-unit-price is a feasible strategy.

But as mentioned in the introduction – dating services are not similar to other paid services which one could find on the Internet. Therefore it can be assumed that next to price and product differentiation various other factors exist (e.g. reputation of the supplier, gender ratio ...) which influence the consumer behavior. The influence of these factors on consumer behavior on dating websites have to be analysed in further studies.

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