UNDERSTANDING THE VIABILITY OF CLOUD SERVICES: A CONSUMER PERSPECTIVE

Manuel Trenz
University of Augsburg, Augsburg, Germany, manuel.trenz@wiwi.uni-augsburg.de

Jan Huntgeburth
University of Augsburg, Augsburg, Germany, jan.huntgeburth@wiwi.uni-augsburg.de

Manuel Trenz and Jan Huntgeburth, 2014, "UNDERSTANDING THE VIABILITY OF CLOUD SERVICES: A CONSUMER PERSPECTIVE", Proceedings of the European Conference on Information Systems (ECIS) 2014, Tel Aviv, Israel, June 9-11, 2014, ISBN 978-0-9915567-0-0
http://aisel.aisnet.org/ecis2014/proceedings/track05/1

UNDERSTANDING THE VIABILITY OF CLOUD SERVICES: A CONSUMER PERSPECTIVE

Complete Research

Trenz, Manuel, University of Augsburg, Germany, manuel.trenz@wiwi.uni-augsburg.de

Huntgeburth, Jan, University of Augsburg, Germany, jan.huntgeburth@wiwi.uni-augsburg.de

Abstract

The cloud service market is highly competitive and IT providers face enormous challenges in developing a sustainable market position. Using a freemium model, many vendors focus on establishing a large customer base quickly. In the long run however, they often lack a strategy to generate revenue streams. Based on a sample of 196 actual users, our study examines how cloud services can become viable, i.e., being self-sustainable on the basis of the user base and revenue streams they generate. Our investigation of four key performance indicators of viable cloud services allows us to create a comprehensive understanding of their drivers and the interrelationships among them. We use the characteristics of cloud services to resolve inconsistencies among previous studies regarding the relationships between customer satisfaction, loyalty, word-of-mouth, and willingness to pay. In contrast to other contexts, we identify loyalty (and not satisfaction) as the major driver of willingness to pay, while satisfaction is sufficient for word-of-mouth. The results indicate that research needs to consider the multidimensional nature of cloud service viability to draw reliable inferences in cloud service scenarios. The key findings are translated into a set of recommendations for cloud providers to compete successfully in this competitive market.

Keywords: Online consumer behaviour, cloud services, freemium, business models, post-adoption behaviour, word-of-mouth, willingness to pay.

1 Introduction

Cloud computing is an important growth market for IT providers since it enables the transformation of their core business from IT as a product towards IT as a service (Iyer and Henderson, 2010). While analysts estimate that cloud computing sales are set to grow by almost 30 percent per year to nearly $73 billion in 2015 worldwide (Rossbach and Welz, 2011), providers' strategies will determine how customers and revenues are distributed. In this fast growing market, many vendors focus on establishing and maintaining a large customer base. Yet, the question how cloud services can become viable, i.e., being self-sustainable on the basis of the user base and revenue streams they generate (Brousseau and Pénard, 2007), remains open (Travlos, 2011). In this study, we examine four consumer-related performance indicators that measure the viability of a cloud service, namely customer satisfaction, loyalty, willingness to pay (WTP) and word-of-mouth (WOM), with respect to their main drivers and interrelationships. As we discuss in the following, these factors indicate to what extent a cloud service is able to build and retain a solid user base and transform users into paying customers.

Research on customer behaviour suggests that post-adoption behaviours are the keys to a firm's survival in highly competitive marketplaces (Kim and Son, 2009; Reichheld, 2003). Although there is comprehensive literature on customer-related business outcomes (Luo and Homburg, 2007) and post-adoption phenomena (Bhattacherjee, 2001; Chao-Min Chiu et al., 2007), we argue that there are three major changes induced by cloud computing which require a re-examination of user behaviour in this new theoretical context. First, cloud computing eliminates an up-front commitment by cloud users allowing them to start small and increase or reduce computing resources as needed (Armbrust et al., 2010). This also implies that market success for cloud providers depends on consumers' post-adoption rather than adoption behaviour. Second, cloud users are highly dependent on the provider over the whole lifecycle of the business relationship. Therefore, the characteristics of the cloud provider-user relationship (e.g., goal conflict, fears of opportunism, information asymmetry, cf. Jensen and Meckling, 1976) have to be incorporated when studying user-related issues of cloud computing. Third, new revenue models by which a service is provided for free but a premium is charged for advanced features (so called "freemium models") are very common in cloud-based scenarios (Teece, 2010). While this revenue model makes it easy to establish a large consumer base, the transformation of these free users into paying consumers most often fails (Kim and Son, 2009). Experts estimate that - on average - only 2% of the users pay for freemium-based cloud services (Needleman and Loten, 2012). In the light of these changes induced by cloud computing, this paper examines the following question: which consumer-related factors influence the viability of cloud services?

The contributions of this paper are threefold. To our best knowledge, this is the first paper to investigate the four key performance indicators and their interrelationships in a single study. We thereby create a comprehensive understanding of their drivers and the interrelations between them. Furthermore, we resolve inconsistencies among previous studies regarding the relationships of satisfaction, loyalty, WOM, and WTP which can be explained by cloud-specific characteristics. Thereby, we find that satisfaction is sufficient for users to spread the word about a service, while loyal customers are necessary to generate revenue streams. Our results emphasize the importance of incorporating the whole set of performance indicators simultaneously to understand the viability of cloud services. Second, we highlight the importance of relational factors for understanding user behaviour in the context of cloud services by establishing users' uncertainty perceptions as an important driver of users' cloud service experience. Finally, we derive practical guidelines for cloud storage providers who struggle building and retaining a solid customer base as well as generating revenues.

The remaining parts of the paper are structured as follows. In the next section, we briefly introduce the cloud computing concept and formulate the focus of our theoretical and empirical analysis. We then

apply this perspective to prior research on post-adoption and post-consumption phenomena to develop a model explaining and predicting the viability of cloud services. Section three introduces our survey research methodology followed by a presentation of the results in section four. Finally, section five discusses implications and avenues for future research.

2 The Viability of Cloud Services

Cloud computing can be seen as evolution of IT service provisioning with respect to both the underlying technology and the business models for delivering IT-based solutions (Iyer and Henderson, 2010). We define cloud computing as a virtualization-based style of computing where IT resources are offered in a highly-scalable way as a cloud service over the internet (Armbrust et al., 2010). Cloud services can be classified according to their service, deployment and revenue model.

We focus on cloud storage services because these services are widely adopted by internet users (Zetta, 2010) and share the typical characteristics of other cloud-based services (e.g., appearance of infinite computing resources available on demand, elimination of an up-front commitment, ability to pay for use of computing resources, see Armbrust et al., 2010). The service infrastructure is owned, built, and managed by third parties. While the technical realization of such public cloud solutions is not fundamentally different from private clouds (Mell and Grance, 2011), the consumer's control over data, network and security is limited (Zhang et al., 2010). Many cloud storage services apply a "freemium" business model (a neologism of free and premium consumption). It is characterized by giving a certain level of consumption to consumers for free while making money on premium features (Teece, 2010). Cloud storage providers typically offer basic functions like file-sharing or synchronization and a certain amount of storage for free but generate revenue from advanced features like a higher level of encryption or more storage. Since many internet customers expect basic services to be free of charge, the freemium model has gained enormous popularity and has also been adopted by a variety of social networking or news platforms (Niculescu and Wu, 2013).

2.1 Key Performance Indicators of Viable Cloud Services

A viable cloud service is one that is self-sustainable on the basis of the user base and revenues it generates (Brousseau and Pénard, 2007). Based on marketing and practitioner literature, we identify four key consumer-related performance indicators – customer satisfaction, loyalty, WOM and WTP – that measure the viability of a cloud service, i.e., its ability to build and retain a solid customer base and transform users into paying customers. We excluded other customer-related outcomes from literature such as repurchasing intentions or complaining behaviours (Gustafsson and Johnson, 2004; Johnson et al., 1995; Luo and Homburg, 2007; Szymanski and Henard, 2001) since they are either not applicable to cloud services or they have no influence on the services' viability as defined above. Therefore, we conducted an extensive, cross-disciplinary literature review (Webster & Watson, 2002) to establish a detailed overview of the studied relationships, contexts, examination objects and the domains of the previously specified performance indicators[1]. We make use of these insights to inform our hypothesis building and to reflect our results in the previous body of literature. In the following, customer satisfaction, loyalty, WOM and WTP are clearly defined and their commercial desirability is highlighted.

Customer satisfaction represents an important cornerstone for customer-oriented businesses since it drives strategically important outcomes (Szymanski and Henard, 2001). In a recent survey, customers

[1] The full outline of the literature review was removed from this manuscript due to space limitations. To facilitate future research in this area, an electronic version can be obtained from the first author upon request.

of cloud providers declare that contentment with the services is the main reason why they have not changed their provider suggesting that customer satisfaction is a key performance indicator for viable cloud services (Redshift Research, 2012). Customer satisfaction furthermore is a core construct in information systems (Kim et al., 2009; Kim and Son, 2009) and marketing research (Homburg et al., 2005; Olsen, 2002). With respect to scope and level of abstraction, two general types of customer satisfaction are distinguished in the literature, namely transaction-specific customer satisfaction and cumulative customer satisfaction (Johnson et al., 1995). While transaction-specific satisfaction deals with the ex-post evaluation of a particular product or service experience, cumulative customer satisfaction is a more abstract construct that describes customers' total performance experience of a service provider to date (Gelbrich and Roschk, 2011). Since we aim to study customer satisfaction in the context of an ongoing cloud service experience, we adapt the cumulative conceptualization in the following (Oliver, 1980). Accordingly, we define satisfaction as customers' subjective judgment resulting from positive and negative observations of a cloud provider's performance (Oliver, 1993).

Customer loyalty is a customer's or user's overall attachment or deep commitment to a product, service, brand, or organization (Oliver, 1999). The concept is described as a customer's intention to continue using (continuance) a product in the IT innovation literature (e.g., Cyr, 2008) or as repeated patronage in the marketing literature (e.g., Lam et al., 2004). Transferring this conceptualization to the context of cloud storage services, we define loyalty as a customer's intention to continue using the cloud storage service of a given provider (Bhattacherjee, 2001). Customer loyalty is an important indicator for the viability of cloud services because it determines how well the current customer base can be retained. Also cloud practice suggests that cloud providers need to become better at holding on to customers since the "payoff takes longer—and because it is easier for customers to switch providers" (Bain, 2012, p. 8).

Word-of-mouth is a "dominant force in the marketplace" (Mangold et al., 1999, p. 73) and an "effective mean to increase the revenues and profits of firms" (Kim and Son, 2009, p. 50). The growing presence of the internet is even expanding its importance for the market success of IT services (Brown et al., 2005). Compared to traditional software products, cloud services are often promoted by a "word-of-mouth model" (Deloitte, 2009, p. 55). WOM refers to "informal communication between private parties concerning evaluations of goods and services" (Anderson, 1998, p. 6) which can be either positive, neutral or negative. The additional benefit of an increasing customer base for the individual user resides in improved opportunities of file sharing or – in some cases – the earning of more storage. In line with previous research, we use positive WOM behaviour – referring to the customer intention to spread favourable information about the service provider and its service among peers (Maxham III and Netemeyer, 2003) – as a proxy for estimating the potential increase of the customer base. Regardless of the channel through which WOM activities are distributed, we believe that any positive WOM activity contributes to the viability of a cloud service because it influences how easy and effective the network externalities inhibited in cloud services can be exploited by the cloud provider.

Customer's willingness to pay is very valuable information necessary to formulate a business strategy. Therefore, the challenge of its determination has long been in focus of research and practice (Miller et al., 2011). For cloud storage providers, mostly using a freemium revenue model, this question is even more important since they depend on customers who upgrade their service. In the IS literature, WTP has been accordingly defined as a customer's willingness to pay a small fee for advanced features of a service currently available for free (Kim and Son, 2009). The importance of WTP as an indicator for the long term viability of cloud services is unquestioned. It determines how well current customers using the free version can be converted into paying customers who actually generate revenues.

In the subsequent paragraphs, the drivers of these four performance indicators for viable cloud storage services are discussed. Our final model entails relationships that have been identified in other contexts as well as relationships specific to cloud services.

2.2 Drivers of Customer Satisfaction

Prior research suggests that customer satisfaction can be well explained by using metrics derived from the technology acceptance model (Devaraj et al., 2002). In the post-adoption phase, the role of initial learning effort can be neglected, while low effort in daily use becomes more important (Hong et al., 2006). Thus, ease of use is a critical success factor for ensuring high levels of customer satisfaction. Moreover, when the service significantly improves customers' job performance and the service becomes more or less indispensable for them, they will be highly satisfied with the service (Bhattacherjee, 2001). Accordingly we suggest that ease of use and usefulness have a positive effect on customer satisfaction:

H1a: Consumers' perceived usefulness of using the service is positively associated with their level of satisfaction.

H1b: Consumers' perceived ease of using the service is positively associated with their level of satisfaction.

Apart from these more general drivers of customer satisfaction, we also propose that low levels of uncertainty perceptions are a premise for higher levels of customer satisfaction. The usage of cloud services is accompanied by a loss of control by the user (Armbrust et al., 2010). This loss of control can lead to perceived uncertainty. Uncertainty perceptions are based on information asymmetries and might include users' privacy, security or availability concerns (Trenz et al., 2013). In particular, it is difficult for the consumer to judge whether his data is not misused, but stored securely, and whether the necessary resource buffers are provided before capacity overload incidents occur. Accordingly, we argue that the ongoing information asymmetry in cloud user-provider relationships causes uncertainty to be also crucial for customer satisfaction:

H1c: In the context of cloud services, consumers' perceived uncertainty of using the service is negatively associated with their level of satisfaction.

2.3 Drivers of Customer Loyalty

Compelling evidence can be found in the literature for the relationship between customer satisfaction and loyalty (Cyr, 2008; Kim et al., 2009; Kim et al., 2002; Lam et al., 2004; Oliva et al., 1992; Olsen, 2002; Otim and Grover, 2006). Other studies argue that although loyal customers are mostly satisfied, the opposite does not have to be true (Oliver, 1999). However, such inconsistencies can be largely explained by definitions and scopes of satisfaction and loyalty that differ from our conceptualization (Han et al., 2008). Consistent with the expectation-confirmation paradigm, we argue that satisfaction with a cloud storage service is a key to building and retaining a loyal base of long-term customers. In contrast, when customers become dissatisfied with the service they will less likely continue using the service any longer (Oliver, 1980):

H2: Consumers' level of satisfaction with the service is positively associated with their loyalty.

2.4 Drivers of Word-of-Mouth

The link between customer satisfaction and WOM is well established in the literature both empirically and theoretically (Brady et al., 2012; Chiou et al., 2002; Gittell, 2002; Heitmann et al., 2007; Hennig-Thurau et al., 2002; Johnson et al., 2008). A key motivation for WOM is a consumer's experience with the services. This service experience produces "a tension which is not eased by the use of the product alone, but must be channelled by way of talk, recommendation, and enthusiasm to restore the balance" (Dichter, 1966, p. 148). Thus, affective states of either valence stimulate WOM transmissions (Westbrook, 1987) and satisfied consumers are likely to engage in positive WOM (Gittell, 2002). We believe that in the context of cloud storage service this relationship also holds and thus, propose:

H3a: Consumers' satisfaction with the service is positively associated with their level of word-of-mouth.

Customer loyalty has not only been discussed as a customer-related outcome of customer satisfaction but also as a driver of WOM. In context of online services, Kim and Son (2009) provide evidence that a person's dedication with the service is a necessary precondition for positive WOM. They argue that since referring a peer puts the customer socially at risk, positive WOM does not occur without a high level of loyalty and dedication for the service provider. We believe that this relationship also holds in our context. Moreover, cloud storage services exhibit strong network effects, i.e., the value of the cloud storage service for customers depends on the number of others using it (Katz and Shapiro, 1986). When users are intending to continue using the service, they also have an incentive to increase the customer base through positive WOM:

H3b: Consumers' loyalty with the service is positively associated with their level of word-of-mouth.

2.5 Drivers of Willingness to Pay

Compared to loyalty and WOM, the relationship between customer satisfaction and WTP has attracted less attention in the literature despite its importance as a key element of the profit equation and its link to profitability (Homburg et al., 2005). Based on equity theory (Adams, 1964), if unequal outcomes of a transaction occur between customer and provider, individuals try to change certain parameters of the exchange and try to establish a balance. Accordingly, a higher level of satisfaction with the service implies a higher outcome for the customer which should also relate to a higher level of outcome, in terms of payment, for the seller. Empirical support for this theoretical argument is provided by Homburg et al. (2005) in the service context. Such considerations are supposed to be even stronger when the customer feels dedicated to a particular firm. If customers feel loyal to the cloud storage service, they prefer to deal with this vendor as opposed to another service provider and accordingly are willing to pay more (Palmatier et al., 2007).

While both a high level of customer satisfaction and loyalty have been found to positively influence WTP in previous research, we propose that in the cloud service context customer satisfaction does not drive consumers to pay for advanced features. The major driver of this difference is the exploitation of the freemium model as explained in the following. Basic functions such as file-sharing or synchronization and a certain amount of storage are usually offered for free. If consumers are highly satisfied, they tend to stay with the present service configuration and feel no necessity to pay a fee for advanced features. Therefore, we propose that there is no direct positive relationship between satisfaction and WTP. In contrast, a strong dedication for the service influences how consumers react when they have the opportunity to intensify their relationship with the provider by using premium features such as a higher level of encryption or more storage. In these situations, their dedication for the service makes customers more open for upgrading their service configuration even if they are charged an additional fee by the provider. Therefore, we assume that loyal customers have a higher willingness to pay a fee for advanced features than consumers without a dedication for the cloud service. However, this willingness to pay is caused by their loyalty and not by their pure satisfaction with the service:

H4a: In the context of cloud services, consumers' satisfaction with the service has no positive effect on their WTP after controlling for customer loyalty.

H4b: Consumers' loyalty with the service is positively associated with their WTP.

Apart from these cloud-specific interactions, the most common view to establish willingness to pay is to focus on the utility that the customer derives from the service (Miller et al., 2011). Accordingly, a higher perceived usefulness of a particular service should lead to a higher willingness to pay:

H4c: Consumers' perceived usefulness of the service is positively associated with their WTP for the service.

An overview of our research model is given in Figure 1.

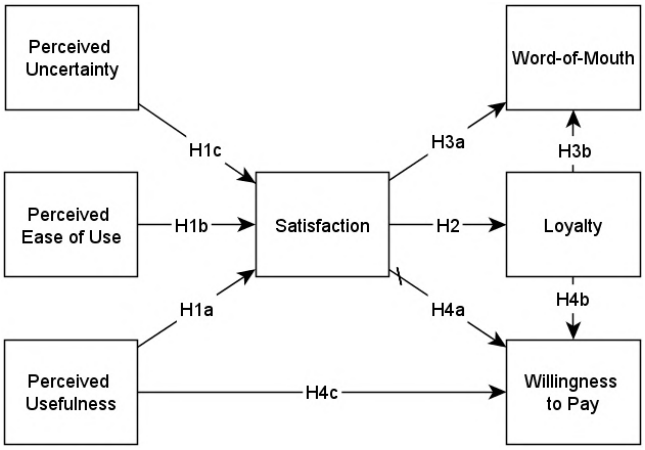

Figure 1. Research Model and Proposed Hypotheses.

3 Research Methodology

The hypotheses derived in the previous section were tested using survey data from an online questionnaire among actual users of cloud storage services. In the following, we describe our measurement development as well as the survey deployment and data collection procedures.

3.1 Measurement Development

All measures used in our study were adopted from existing measures. However, they were adapted to the context of our study. On grounds of the critique raised about the validation of scales in the IS discipline (e.g., Boudreau et al., 2001; MacKenzie et al., 2011), we decided to re-validate our constructs. This process included the definition and assessment of the domain and dimensionality of the constructs using two sorting procedures (Moore and Benbasat, 1991) and the assessment of content validity using a rating method (Hinkin and Tracey, 1999; MacKenzie et al., 2011). The preliminary instrument was then pilot tested with 25 participants. After the pre-test, the respondents were asked to give open feedback regarding composition of the survey, overall time, and other issues they experienced. Following the pre-test, the instrument was shortened, refined, and validated for its statistical properties. In the final survey, all principal constructs were measured as first-order reflective constructs using three or more indicators. An overview of all measures and their sources is given in Appendix A.

3.2 Survey Deployment and Data Collection

We collected our data using an online survey, since the regular online access is a prerequisite for usage of such a service. On the first page of the survey, the definition of cloud storage services was given and participants were asked which cloud storage service they use most (if any). All questions were then automatically adapted to refer to their particular service. The survey was undertaken with Bachelor, Master and PhD students from two large universities. Course credits or the chance to win Amazon vouchers were set as incentives for participation. In all, 235 completed responses were collected. The time of completion was recorded to eliminate responses with unusually short completion times. Furthermore, participants who did not use any cloud storage service were removed.

In the end, the results of 196 cloud service users were deemed usable. Respondents were 40% female (60% male) between the ages of 18 and 34 years (Mean: 24; Median: 24). To control for non-response bias, we compared late respondents' answers, who often are similar to non-respondents (Miller and Smith, 1983), to the ones who answered in the beginning of the period using a t-test. Since the answers of early and late respondents for none of the 24 items differed significantly ($p>.05$), we have evidence that non-response did not affect our results.

4 Data Analysis and Results

We used covariance-based structural equation modelling (CBSEM using AMOS 20) to validate the structural model and test our hypotheses. Two major arguments drove our decision in favour of CBSEM. First, we are trying to test the relationships between the constructs in this new theoretical context rather than exploring new relationships. Hence, we can make use of the overall inferential test statistic that CBSEM provides (Gefen et al., 2011). Second and most importantly, most of the previous models testing the relationships between some of our constructs in other contexts used CBSEM. Therefore, we used the same tool to enable comparability of the results. Regardless of the chosen method, our findings also hold when applying PLS using SmartPLS (Ringle et al., 2005).

4.1 Measurement Validation

All measurement items loaded above the threshold value of 0.7, all but three loaded above 0.8. These values suggest an adequate level of individual indicator validity and reliability (Bollen, 1989; Fornell and Larcker, 1981). For constructs to be reliable, Cronbach's alpha must exceed 0.7, and composite reliability must be higher than 0.7 (Fornell and Larcker, 1981; Nunnally and Bernstein, 1994). All constructs reached Cronbach's alpha above 0.9 and composite reliability coefficients were greater than 0.9. The validity at the construct level is assured because the latent constructs account for the majority of the variance in its indicators on average. Accordingly, average variance extracted should exceed 0.5 (MacKenzie et al., 2011). In our model, it exceeds 0.8 for all constructs. The scores are summarized in Table 1 and Appendix B.

Discriminant validity of the constructs was confirmed by two methods. First, we confirmed that the square root of the average variance extracted for each construct is higher than the variance that the construct shares with every other construct in the model (cf. Appendix B) (Fornell and Larcker, 1981). Second, we conducted the between constructs test recommended by Anderson and Gerbing (1988). We computed two chi-square statistics for each pair of constructs. One model with a free correlation between the constructs and one model where the correlation between the constructs was set to one (suggesting that the constructs are not distinct) were compared. The differences between the two chi-square statistics for each pair of constructs were significant ($\alpha = 0.01$), implying that the constructs are empirically distinct.

Since the data collection was based on a single survey, we applied the recommended procedural and statistical remedies suggested by Podsakoff et al. (2003) to minimize and control for common method bias. We used a Harman one-factor test to test that neither one single factor emerged nor one factor accounted for more than 50% of the variance. Overall, eight factors with eigenvalues above 1 emerged, explaining 83% of the variance. The most prominent component accounted for 38% of the variance. We furthermore applied a marker variable procedure as suggested by Lindell and Whitney (2001). We used the smallest correlation in the correlation matrix as proxy for the common method variance. However, the adjustment of the correlation matrix by this value did not change their statistical significance. This indicates absence of a common method bias. Lastly, we included a latent general common method factor that was allowed to load on every item in our model (Podsakoff et al., 2003). The results suggest that common method was a very small contributor to variance. Overall, we can therefore rule out the concern that common method variance biased the results of our study.

Constructs	Variable Name	Factor Loadings	Items per Construct	Composite Reliability	Mean	Standard Deviation
1. Ease of Use	EOU1 EUO2 EUO3 EUO4	0.90 0.90 0.86 0.75	4	0.95	5.61	1.33
2. Loyalty	LOY1 LOY2 LOY3	0.91 0.99 0.87	3	0.97	3.92	1.77
3. Satisfaction	SAT1 SAT2 SAT3	0.79 0.93 0.90	3	0.95	5.69	1.09
4. Uncertainty	UNC1 UNC2 UNC3 UNC4	0.91 0.94 0.90 0.88	4	0.97	2.89	1.43
5. Usefulness	PU1 PU2 PU3 PU4	0.88 0.91 0.84 0.78	4	0.95	6.18	1.02
6. Willingness to Pay	WTP1 WTP2 WTP3	0.91 0.89 0.95	3	0.97	2.73	1.74
7. Word-of-Mouth	WOM1 WOM2 WOM3	0.91 0.93 0.88	3	0.96	5.57	1.20
8. IT Experience	ITEXP1 ITEXP2 ITEXP3	0.93 0.97 0.81	3	0.96	4,94	1.49
9. Internet Use	IUSE	-	1	-	4.27	1.27
10. Age	AGE	-	1	-	24.30	3.97
11. Gender	GEN	-	1	-	0.6	0.49
12. Income	INC	-	1	-	2.67	2.02

Table 1. Measurement Model Results

4.2 Testing the Structural Model

The results of the structural model testing including path coefficients, significance levels and explained variance are presented in Figure 3. The chi-square statistic is 449.6 with 240 degrees of freedom (χ^2/df = 1.87). The other goodness-of-fit and badness-of-fit tests that are suggested by Gefen et al. (2011) delivered decent values and confirm the overall good fit of the model (SRMR=0.048; RMSEA=0.067; GFI=0.84; AGFI=0.8; NFI=0.91; CFI=0.95). We included age, gender and income as control variables into our model. Beyond these demographic variables, we also included IT experience as an additional covariate into our model to check whether the effects can be explained by differences in the users' level of experience with technology, computer or the internet. Furthermore, we controlled for internet use per day since the use of the internet is a prerequisite for the effective utilization of cloud services. We found significant negative effects of age on loyalty (b=-.19;p<.01). Furthermore, IT experience had a strongly positive effect on loyalty (b=.20;p<.01). All hypothesized effects remained within the same level and their significance was not influenced by the control variables.

Our empirical evidence indicates that satisfaction does not influence WTP. The path is positive as long as the relationship between loyalty and WTP is omitted but turns insignificant when this path is included. We applied the bootstrap procedure suggested by Zhao et al. (2010), as a superior version of the mediation test by Baron and Kenny (1986), to further test the relationship between satisfaction,

loyalty and WTP. Based on 5000 bootstrap samples, we found that the mean indirect effect of satisfaction (via loyalty) on WTP is positive and significant (a × b = 0.30) with a 95% confidence interval excluding zero (0.170 - 0.486). The direct effect from satisfaction on WTP (c = 0.125) was insignificant (p = 0.34). Therefore, we have an indirect-only mediation (Zhao et al. 2010) or in other words, loyalty perfectly mediates the relationship between satisfaction and WTP (Baron and Kenny, 1986).

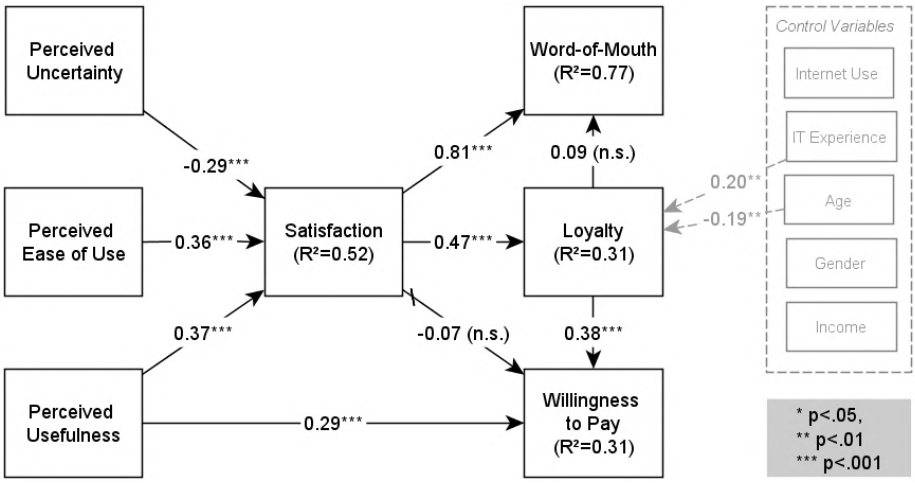

Figure 2. Structural Model Results.

5 Discussion

The objective of this study is to develop and test a parsimonious model that examines the drivers of four key performance indicators of viable cloud services. In the emerging context of cloud services, we combine established and new, cloud-specific drivers of each performance indicator and investigate their influence on each other. Thereby, we were able to resolve inconsistencies among previous studies regarding the relationships between satisfaction, loyalty, WOM and WTP in this new theoretical context. Overall, our findings provide strong support for our research model. The three major findings that provide new insights on viable cloud services are presented in detail in the following. Subsequently, the theoretical and practical contributions as well as limitations of our study and future research are discussed.

5.1 Key Findings

The two TAM constructs, perceived usefulness and perceived ease of use, and the cloud-specific driver, perceived uncertainty, are well-suited to explain customer satisfaction in the context of cloud storage services. This is consistent to the expectation-confirmation paradigm where satisfaction is said to be formed based on the expectations and experiences with the services (Bhattacherjee, 2001; Hong et al., 2006). Hereby, users' believes about the service (i.e., perceived uncertainty, usefulness and ease of use) are a function of the expectations and subsequent experiences with the service (Oliver, 1977). While the TAM constructs have already been tested in previous studies (Devaraj et al., 2002; Hong et al., 2006), this study is the first to examine uncertainty perceptions as a major driver of customer satisfaction in the context of cloud computing.

We find strong empirical support for the positive relationship between satisfaction and positive WOM (Brady et al., 2012; Heitmann et al., 2007; Zhang and Bloemer, 2008). This shows that satisfied customers have a tendency to share their positive service experience with their peers (Arndt, 1967; Dichter, 1966). Concerning loyalty, our results indicate that it is neither sufficient nor necessary for WOM. This opposes our assumption that users are only willing to take the social risks of

recommending the cloud service when they are highly dedicated to the service as highlighted by Kim and Son (2009) in their study of online services. A possible explanation for this finding is that the additional benefit of an increasing customer base (improved opportunities for file sharing and – in some cases – more storage as an incentive) which motivates WOM activities is not limited to loyal customers but is instead a goal of all users positively experiencing the service.

Our last performance indicator, WTP, is extremely important for providers in the context of cloud storage services as revenues are generated based on a freemium revenue model (Teece, 2010). Unlike previous marketing research (Homburg et al., 2005), our study shows that customer satisfaction has only an indirect effect on customers' WTP in the context of cloud storage services. Few previous studies have also found no support for the direct positive relationship between customer satisfaction and WTP, e.g., in the contexts of consumer goods (Zhang and Bloemer, 2008) and travel services (Homburg et al., 2009). However, these contexts are hardly comparable to our study. Overall, our findings indicate that for cloud services, constructs other than customer satisfaction are needed to explain revenue streams of cloud services. While previous research has mainly concentrated on customer satisfaction as the central concept for increasing revenue streams, our study reveals that loyalty is a key for cloud storage providers to yield profits. What needs to be kept in mind: reaching customer loyalty is especially difficult for cloud providers because they are hardly able to establish social bonding or personal fortitude as common in offline service scenarios (Oliver, 1977). Therefore, when loyalty becomes a key driver of such important business-outcomes like WTP, cloud providers have to ensure not only a high level of satisfaction but also have to find alternative measures to tie customers to the service. One starting point for providers is the customers' usefulness perception of the service which is found to directly influence WTP consistent with previous research.

5.2 Theoretical Contribution

Overall, our study makes two major theoretical contributions. First, explaining the impact and success of IT is much more complex in an IT world where digital services begin to substitute IT products. Our study shows that in the context of cloud service, it is not sufficient to focus solely on one indicator such as loyalty or WOM. The complex interrelationships between satisfaction, loyalty, WTP and WOM create the necessity to move away from simple models focusing on single outcome variables. For instance, a focus on loyalty as the main indicator would neglect WOM, which is an influential factor for cloud service success. This simplification would involve the danger of incorrect inferences or policies since loyalty is not directly connected to WOM and can therefore not be used as a single indicator of the viability of a cloud service. This implies that we need to develop theories that account for the multidimensional nature of cloud service viability and incorporate the interrelationships between the different dimensions. Moreover, the mediating effects identified in our study should encourage research to re-examine our four indicators together in other theoretical contexts in order to uncover spurious relationships wrongly inferred in previous studies.

Second, our study highlights the importance of incorporating relational factors for understanding user behaviour and users' service experience in the context of cloud services. Previous research on technology adoption or continuance has mainly looked at the perceived characteristics of the IT artefact (e.g., performance expectancy, effort expectancy) or the social environment of the user (e.g., social influence, facilitating conditions) (Venkatesh et al., 2003). When using cloud services however, customers are dependent on the provider over the whole life-cycle of the business relationship. As their relationship is continuously characterized by information asymmetries, the corresponding uncertainty has to be taken into account when studying customer behaviour in the cloud context. Our study shows that the characteristics of the cloud provider-user relationship are increasingly shaping users' experiences with the service. These differ sharply from other service contexts, where the service provisioning takes place within a limited time frame. Accordingly, our study establishes users' uncertainty perception as an important antecedent for explaining user behaviour in the context of cloud

computing. We encourage future research to be more strongly attentive to the characteristics of the cloud provider-user relationship and study post-adoption phenomena using relational factors such as users' uncertainty perception.

5.3 Limitations and Suggestions for Future Research

Some limitations of our study should be mentioned. First, although we study consumers of cloud storage services, we recognize that students might not represent the broader population of cloud customers as a whole. Whether the results are applicable to other cloud users could only be assessed by replicating the study using different groups of subjects. Nevertheless, students comprise an important segment of internet users and adopters of cloud services and we tried to address this potential concern by including student cloud consumers in the ages between 18 and 34 years.

Second, our study identified uncertainty as an important inhibitor of satisfaction. Unfortunately the scope of our study did not allow us to explain how the uncertainty connected to cloud services arises and how it could be mitigated. However, this question should be addressed in further research because it is of high theoretical and practical interest.

Third, we find no empirical support for our hypothesis that loyalty positively influences word-of-mouth. Although we identify possible explanations for this surprising finding, future studies should try to replicate our findings and include additional constructs (e.g., channel through which word-of-mouth is spread, benefits from word-of-mouth) to test potential explanations for this empirical result.

Fourth, our findings regarding the effects of satisfaction and loyalty on willingness to pay contradict previous studies. We explain these findings by the unique characteristics of cloud services compared to other contexts. However, this finding calls for further research challenging these relationships in other scenarios and identifying contingency factors in order to create a broader understanding of the development of willingness to pay in different online service scenarios.

5.4 Implications for Practice

From a practical perspective, the study has several implications for cloud providers. Although cloud services have reached remarkable user bases (Zetta, 2010), it is still questionable how they can be turned into viable services in this competitive market. There are several strategic implications that can be derived from our study for cloud providers. First, uncertainty perceptions of users must be mitigated to satisfy customers. As a consequence, cloud providers should implement trust building measures such as privacy controls, security seals or service level agreements and communicate them aggressively to reduce information asymmetries. Second, customer satisfaction is a major driver of loyalty, while other drivers can only hardly be utilized for cloud services. Since there are very little points of contact with the customers, these have to be exploited effectively (e.g., problem handling or requests using social web technology) by providers for social bonding. Third, satisfied customers are willing to communicate their experiences to their peers. Therefore, providers should offer simple and visible tools to customers to minimize their effort to spread the word about the service. Moreover, providers should offer low entrance barriers (e.g., short set-up time) for customers who are exposed to WOM. Lastly, perceived usefulness and loyalty are important success factors for generating revenue stream. Therefore, cloud providers should focus on creating a loyal customer base to turn profitable instead of a pure focus on growth through free service offerings. For cloud providers, this is the major challenge since cloud storage services are characterized by low switching costs and a high level of market competition.

6 Conclusion

This study examines consumer-related factors influencing the viability of cloud services, in particular cloud storage services. Our investigation of four performance indicators enables us to disentangle the complex relationships among them for the emerging case of cloud services. We find that satisfaction, and not loyalty, is necessary in order to motivate consumers to spread the word about the cloud service and thereby attract new customers. In order to create revenue streams however, customer satisfaction is not sufficient and a loyal relationship with the consumer is necessary. We discuss these results in the light of the specific characteristics of cloud based services. Moreover, we establish uncertainty as a major driver of satisfaction beyond its well established drivers usefulness and ease of use. The insights are of high importance to cloud providers who often manage to establish a large customer base quickly but then fail to generate revenue streams.

Appendix A: Measurement Items for Principal Constructs

Willingness To Pay (Kim and Son, 2009)	**Perceived Ease of Use** (Davis, 1989; Pavlou et al., 2007)
WTP1: I am willing to pay a premium for related products of [CS]. WTP2: I am willing to pay a premium for advanced features (e.g., more storage) of [CS]. WTP3: I am willing to pay a premium for advanced functionality of [CS].	PEU1: I find [CS] easy to use. PEU2: Using [CS] does not require a lot of mental effort. PEU3: I find it easy to get [CS] to do what I want it to do. PEU4: It is easy for me to become skillful at using [CS].
Word-Of-Mouth (Kim and Son, 2009)	**Perceived Usefulness** (Davis, 1989; Pavlou et al., 2007)
WOM1: I will say positive things about [CS] to other people. WOM2: I will recommend [CS] to anyone who seeks my advice. WOM3: I will refer my acquaintances to [CS].	PU1: Using [CS] enhances my effectiveness. PU2: Using [CS] enhances my productivity. PU3: Using [CS] improves my performance. PU4: Using [CS] enables me to accomplish tasks more quickly.
Satisfaction (Kim and Son, 2009; Lam et al., 2004)	**Loyalty** (Ray et al., 2012)
SAT1: I am very contented with [CS]. SAT2: I am very pleased with [CS]. SAT3: Overall, I am very satisfied with [CS].	LOY1: It means a lot to me to continue to use [CS]. LOY2: I feel loyal towards [CS]. LOY3: I consider myself to be highly loyal to [CS].
Perceived Uncertainty (Pavlou et al., 2007)	
UNC1: I feel that using [CS] involves a high degree of uncertainty. UNC2: I feel that the uncertainty associated with the services provided by [CS] is high. UNC3: I am exposed to many uncertainties if I use [CS]. UNC4: There is a high degree of uncertainty (i.e., the service you receive may not be what you expect) when using [CS].	

Appendix B: Correlation Matrix and AVE

	Ease of Use	**Loyalty**	**Satisfaction**	**Uncertainty**	**Usefulness**	**WTP**	**WOM**
Ease of Use	**0.923**						
Loyalty	0.246	**0.961**					
Satisfaction	0.535	0.46	**0.933**				
Uncertainty	-0.243	-0.212	-0.462	**0.953**			
Usefulness	0.369	0.25	0.544	-0.222	**0.923**		
Willingness To Pay	0.166	0.418	0.261	-0.111	0.373	**0.959**	
Word-of-Mouth	0.465	0.472	0.869	-0.401	0.473	0.254	**0.952**
Note: The diagonal elements (in bold) represent the square root of AVE.							

References

Adams, J. S. (1964). Inequality in Social Exchange. In Berkowitz, L. (Ed), Advances in Experimental Social Psychology, 267–299, Academic Press, New York, NY.

Anderson, E. W. (1998). Customer satisfaction and word of mouth. Journal of Service Research, 1 (1), 5–17.

Anderson, J. C., Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. Psychological Bulletin, 103 (3), 411–423.

Armbrust, M. et al. (2010). A view of cloud computing. Communications of the ACM, 53 (4), 50–58.

Arndt, J. (1967). Role of product-related conversations in the diffusion of a new product. Journal of Marketing Research, 4 (3), 291–295.

Bain (2012). Selling the cloud. Retrieved 27 June 2013, from http://www.bain.com/publications/articles/selling-the-cloud.aspx.

Baron, R. M., Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. Journal of Personality and Social Psychology, 51 (6), 1173–1182.

Bhattacherjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. MIS Quarterly, 25 (3), 351–370.

Bollen, K. A. (1989). Structural Equations with Latent Variables. Wiley, Chapel Hill, USA.

Boudreau, M.-C., Gefen, D., Straub, D. W. (2001). Validation in Information Systems Research: A State-of-the-Art Assessment. MIS Quarterly, 25 (1), 1–16.

Brady, M. K., Voorhees, C. M., Brusco, M. J. (2012). Service sweethearting: its antecedents and customer consequences. Journal of Marketing, 76 (2), 81–98.

Brousseau, E., Pénard, T. (2007). The Economics of Digital Business Models: A Framework for Analyzing the Economics of Platforms. Review of Network Economics, 6 (2), 81–114.

Brown, T. J., Barry, T. E., Dacin, P. A., Gunst, R. F. (2005). Spreading the word: investigating antecedents of consumers' positive word-of-mouth intentions and behaviors in a retailing context. Journal of the Academy of Marketing Science, 33 (2), 123–138.

Chao-Min Chiu, Chao-Sheng Chiu, Hae-Ching Chang (2007). Examining the integrated influence of fairness and quality on learners' satisfaction and web-based learning continuance intention. Information Systems Journal, 17 (3), 271–287.

Chiou, J.-S., Droge, C., Hanvanich, S. (2002). Does customer knowledge affect how loyalty is formed? Journal of Service Research, 5 (2), 113–124.

Cyr, D. (2008). Modeling web site design across cultures: relationships to trust, satisfaction, and e-loyalty. Journal of Management Information Systems, 24 (4), 47–72.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13 (3), 319–340.

Dellarocas, C. (2003). The Digitization of Word of Mouth: Promise and Challenges of Online Feedback Mechanisms. Management Science, 49 (10), 1407–1424.

Deloitte (2009). Cloud computing - Forecasting change. Retrieved 27 June 2011, from https://www.deloitte.com/assets/Dcom-Global/Local%20Assets/Documents/TMT/cloud_-_market_overview_and_perspective.pdf.

Devaraj, S., Fan, M., Kohli, R. (2002). Antecedents of B2C channel satisfaction and preference: validation e-commerce metrics. Information Systems Research, 13 (3), 316–333.

Dichter, E. (1966). How word-of-mouth advertising works. Harvard Business Review, 44 (6), 147–166.

Fornell, C., Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18 (1), 39–50.

Gefen, D., Rigdon, E. E., Straub, D. (2011). An update and extension to sem guidelines for administrative and social science research. MIS Quarterly, 35 (2), iii–xiv.

Gelbrich, K., Roschk, H. (2011). A meta-analysis of organizational complaint handling and customer responses. Journal of Service Research, 14 (1), 24–43.
Gittell, J. H. (2002). Relationships between service providers and their impact on customers. Journal of Service Research, 4 (4), 299–311.
Gustafsson, A., Johnson, M. D. (2004). Determining attribute importance in a service satisfaction model. Journal of Service Research, 7 (2), 124–141.
Han, X., Kwortnik, R. J., Wang, C. (2008). Service loyalty: an integrative model and examination across service contexts. Journal of Service Research, 11 (1), 22–42.
Heitmann, M., Lehmann, D. R., Herrmann, A. (2007). Choice goal attainment and decision and consumption satisfaction. Journal of Marketing Research, 44 (2), 234–250.
Hennig-Thurau, T., Gwinner, K. P., Gremler, D. D. (2002). Understanding Relationship Marketing Outcomes an Integration of Relational Benefits and Relationship Quality. Journal of Service Research, 4 (3), 230–247.
Hinkin, T. R., Tracey, J. B. (1999). An Analysis of Variance Approach to Content Validation. Organizational Research Methods, 2 (2), 175–186.
Homburg, C., Koschate, N., Hoyer, W. D. (2005). Do Satisfied Customers Really Pay More? A Study of the Relationship Between Customer Satisfaction and Willingness to Pay. Journal of Marketing, 69 (2), 84–96.
Homburg, C., Wieseke, J., Hoyer, W. D. (2009). Social identity and the service–profit chain. Journal of Marketing, 73 (2), 38–54.
Hong, S., Thong, J. Y. L., Tam, K. Y. (2006). Understanding Continued Information Technology Usage Behavior: A Comparison of Three Models in the Context of Mobile Internet. Decision Support Systems, 42 (3), 1819–1834.
Iyer, B., Henderson, J. (2010). Preparing for the Future: Understanding the Seven Capabilities of Cloud Computing. MIS Quarterly Executive, 9 (2), 117–131.
Jensen, M. C., Meckling, W. H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3 (4), 305–360.
Johnson, M. D., Anderson, E. W., Fornell, C. (1995). Rational and adaptive performance expectations in a customer satisfaction framework. Journal of Consumer Research, 21 (4), 695–707.
Johnson, M. W., Christensen, C. M., Kagermann, H. (2008). Reinventing your business model. Harvard Business Review, 86 (12), 50–59.
Katz, M. L., Shapiro, C. (1986). Technology adoption in the presence of network externalities. Journal of Political Economy, 94 (4), 822–841.
Kim, D. J., Ferrin, D. L., Rao, H. R. (2009). Trust and satisfaction, two stepping stones for successful e-commerce relationships: a longitudinal exploration. Information Systems Research, 20 (2), 237–257.
Kim, J., Lee, J., Han, K., Lee, M. (2002). Businesses as buildings: metrics for the architectural quality of internet businesses. Information Systems Research, 13 (3), 239–254.
Kim, S. S., Son, J.-Y. (2009). Out of Dedication or Constraint? A Dual Model of Post-Adoption Phenomena and Its Empirical Test in the Context of Online Services. MIS Quarterly, 33 (1), 49–70.
Lam, S. Y., Shankar, V., Erramilli, M. K., Murthy, B. (2004). Customer Value, Satisfaction, Loyalty, and Switching Costs: An Illustration from a Business-to-Business Service Context. Journal of the Academy of Marketing Science, 32 (3), 293–311.
Lindell, M. K., Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. Journal of Applied Psychology, 86 (1), 114–121.
Luo, X., Homburg, C. (2007). Neglected outcomes of customer satisfaction. Journal of Marketing, 71 (2), 133–149.
MacKenzie, S. B., Podsakoff, P. M., Podsakoff, N. P. (2011). Construct Measurement and Validation Procedures in Mis and Behavioral Research: Integrating New and Existing Techniques. MIS Quarterly, 35 (2), 293–334.

Mangold, W. G., Miller, F., Brockway, G. R. (1999). Word-of-mouth communication in the service marketplace. Journal of Services Marketing, 13 (1), 73–89.
Maxham III, J. G., Netemeyer, R. G. (2003). Firms reap what they sow: the effects of shared values and perceived organizational justice on customers' evaluations of complaint handling. Journal of Marketing, 67 (1), 46–62.
Mell, P., Grance, T. (2011). The NIST Definition of Cloud Computing. Retrieved 19 June 2012, from http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf.
Miller, K. M., Hofstetter, R., Krohmer, H., Zhang, Z. J. (2011). How should consumers' willingness to pay be measured? An empirical comparison of state-of-the-art approaches. Journal of Marketing Research, 48 (1), 172–184.
Miller, L. E., Smith, K. L. (1983). Handling nonresponse issues. Journal of Extension, 21 (5), 45–50.
Moore, G. C., Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. Information Systems Research, 2 (3), 192–222.
Needleman, S. E., Loten, A. (2012). When Freemium Fails. Retrieved 12 January 2013, from http://online.wsj.com/news/articles/SB10000872396390443713704577603782317318996.
Niculescu, M. F., Wu, D. J. (2013). Economics of Free Under Perpetual Licensing: Implications for the Software Industry. Information Systems Research, forthcoming.
Nunnally, J. C., Bernstein, I. H. (1994). Psychometric Theory. 3rd Edition. McGraw-Hill Series in Psychology, McGraw-Hill, Ohio, USA.
Oliva, T. A., Oliver, R. L., MacMillan, I. C. (1992). A Catastrophe Model for Developing Service Satisfaction Strategies. Journal of Marketing, 56 (3), 83–95.
Oliver, R. L. (1977). Effect of expectation and disconfirmation on postexposure product evaluations: an alternative interpretation. Journal of Applied Psychology, 62 (4), 480–486.
Oliver, R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. Journal of Marketing Research, 17 (4), 460–469.
Oliver, R. L. (1993). Cognitive, affective, and attribute bases of the satisfaction response. Journal of Consumer Research, 20 (3), 418–430.
Oliver, R. L. (1999). Whence consumer loyalty? Journal of Marketing, 63 (4), 33–44.
Olsen, S. O. (2002). Comparative evaluation and the relationship between quality, satisfaction, and repurchase loyalty. Journal of the Academy of Marketing Science, 30 (3), 240–249.
Otim, S., Grover, V. (2006). An empirical study on web-based services and customer loyalty. European Journal of Information Systems, 15 (6), 527–541.
Palmatier, R. W., Scheer, L. K., Steenkamp, J.-B. E. . (2007). Customer loyalty to whom? managing the benefits and risks of salesperson-owned loyalty. Journal of Marketing Research, 44 (2), 185–199.
Pavlou, P. A., Liang, H., Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: a principal-agent perspective. MIS Quarterly, 31 (1), 105–136.
Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. Journal of Applied Psychology, 88 (5), 879–903.
Ray, S., Kim, S. S., Morris, J. G. (2012). Research note - online users' switching costs: their nature and formation. Information Systems Research, 23 (1), 197–213.
Redshift Research (2012). 45% are unsure where data is hosted. Retrieved 28 July 2012, from https://www.q3internet.co.uk/press-releases/45-are-unsure-where-data-is-hosted/.
Reichheld, F. F. (2003). The one number you need to grow. Harvard Business Review, 81 (12), 46–54.
Ringle, C., Wende, S., Will, A. (2005). SmartPLS. SmartPLS, Hamburg, Germany.
Rossbach, C., Welz, B. (2011). Survival of the fittest - How Europe can assume a leading role in the cloud. Retrieved 19 June 2012, from http://www.rolandberger.com/media/pdf/Roland_Berger_Cloud_Ecosystem_D_20111130.pdf.
Szymanski, D., Henard, D. (2001). Customer Satisfaction: A Meta-Analysis of the Empirical Evidence. Journal of the Academy of Marketing Science, 29 (1), 16–35.

Teece, D. J. (2010). Business models, business strategy and innovation. Long Range Planning, 43 (2–3), 172–194.

Travlos, D. (2011). Economics of the Cloud - Can It Make Money? Retrieved 27 June 2012, from http://www.forbes.com/sites/darcytravlos/2011/11/22/economics-of-the-cloud-can-it-make-money/.

Trenz, M., Huntgeburth, J., Veit, D. (2013). The Role of Uncertainty in Cloud Computing Continuance: Antecedents, Mitigators, and Consequences. In: Proceedings of the 21st European Conference on Information Systems (ECIS), Utrecht, NL.

Venkatesh, V., Morris, M. G., Gordon B. Davis, Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27 (3), 425–478.

Westbrook, R. A. (1987). Product/ consumption-based affective responses and postpurchase processes. Journal of Marketing Research, 24 (3), 258–270.

Zetta (2010). Cloud Storage Adoption Trends, Barriers and Expectations - a Survey. Retrieved 3 May 2012, from http://pages.zetta.net/rs/zetta/images/Zetta_Cloud_Storage_Survey.pdf.

Zhang, J., Bloemer, J. M. M. (2008). The impact of value congruence on consumer-service brand relationships. Journal of Service Research, 11 (2), 161–178.

Zhang, Q., Cheng, L., Boutaba, R. (2010). Cloud computing: state-of-the-art and research challenges. Journal of Internet Services and Applications, 1 (1), 7–18.

Zhao, X., Jr., J. G. L., Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis. Journal of Consumer Research, 37 (2), 197–206.