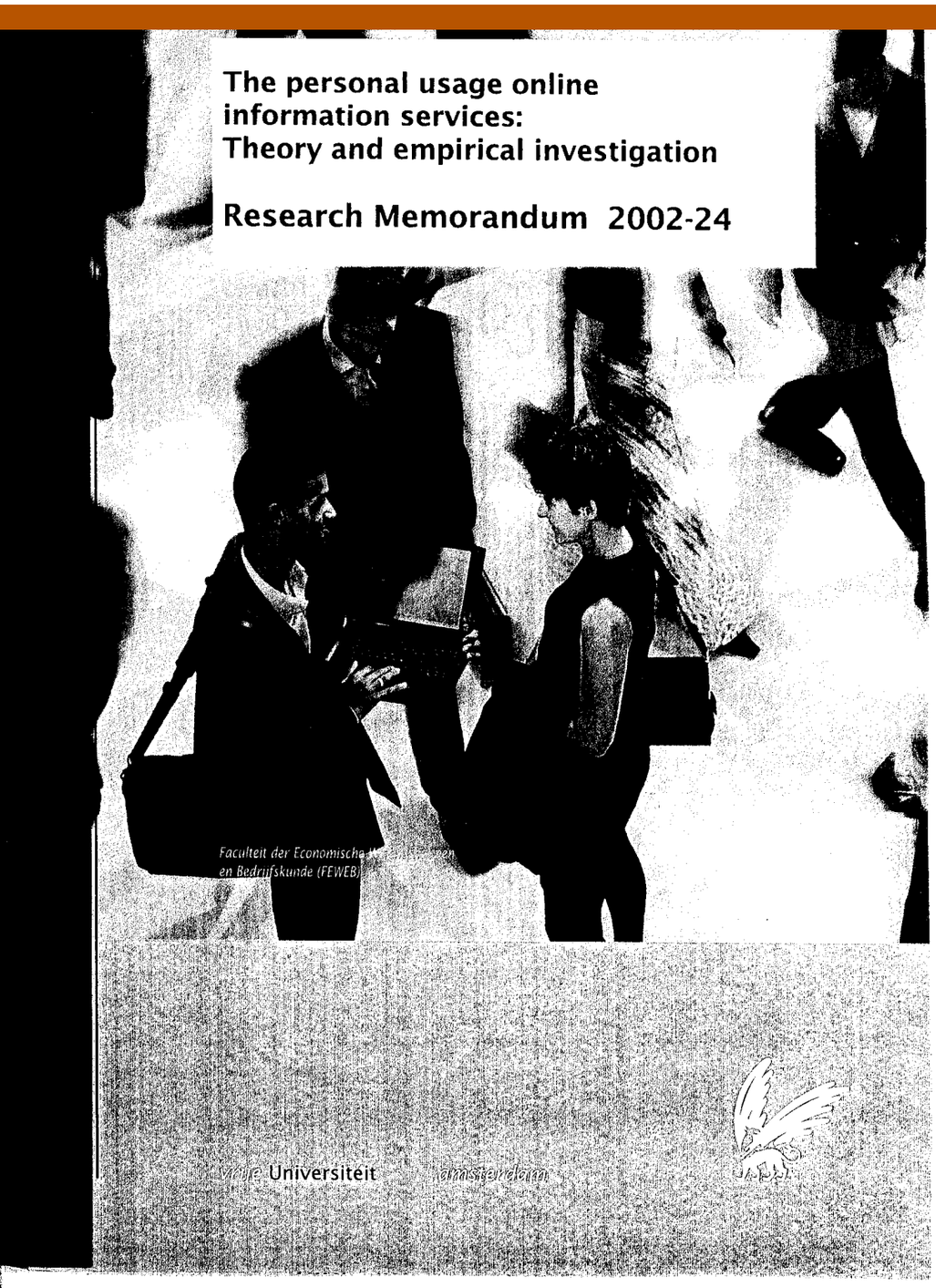
The personal usage online information services: Theory and empirical investigation

Research Memorandum 2002-24



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THE PERSONAL USAGE OF ONLINE INFORMATION SERVICES: THEORY AND EMPIRICAL INVESTIGATION

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ACKNOWLEDGEMENTS

The author wishes to thank his colleagues at the Vrije Universiteit Amsterdam for their participation in the pre-studies of this research and Dorine van der Wind and Taco Stomps from Filmfocus.nl for their kind cooperation.

BIO

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Keywords: Online information services, IS usage, user experience, gender, Technology Acceptance Model, Triandis

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ABSTRACT

In thispaper we develop a conceptual framework around the attitudes and intentions towards using online information sewice, and we theorise about the differences in relationships between regular information systems and online information services, Specifically, we hypothesize (1) that affect and perceived ease of use are more important than perceived usefulness, and (2) that gender and experience will make a significant difference in people's evaluation to use the service. These hypotheses are then tested with a quantitative study, using 1144 respondents of a real-life online information service. The results effectively demonstrate how the cognitive-affective pattern of user evaluations develops when users start becoming more experienced with an online information sewice.

THE PERSONAL USAGE OF ONLINE INFORMATION SERVICES: THEORY AND EMPIRICAL INVESTIGATION

INTRODUCTION

In this paper we are concemed with the factors influencmg the usage of online information services. An ***information service*** is defined as the provision of data about a single topic (or a set of related topics), by an organisation or an individual, for the purpose of public use by other organisations or other individuals. An ***online*** information service is user-accessible only through a technological artefact, such as a webbrowser, a mobile phone, a personal digital assistant or any other technological device.

Examples of online information services are widely available in today's modem societies, and they range from services that provide information to consumers, such as weather information or movie information, to services that provide information to businesses, such as trading opportunities, transportation schedules, and govemment services. Yet despite the omnipresence of online information services, information system researchers have not paid much attention to the theoretical issues surrounding their usage (for an exception, see (Hansen 1995)). The reader may argue that this is so because services can be treated as specific *instances* of information systems. By inference, theories about IS usage are sufficiently general to be applicable here, and little moditïcation would be needed. Yet despite the similarities, enough dissimilarities exist to set online information services apart as a separate class of systems to study.

Information systems and information services are developed for different classes of users. In the case of management information systems, the users are *employees*, located inside one or several organisations. In the case of information services, the users are consumers, located outside thc organisation. This phenomenon, which has also been termed the "unknown user"

problem (Hansen 1995) generates differences in at least three areas: system purpose, system environment, and system content.

The traditional purpose of implementing information systems is to contribute to the efficiency and effectiveness of the organisation (DeLone and McLean 1992). In contrast, information services have widely different purposes for the organisation that provides them. First of all, they can be (and often are) provided for a fee or accompanied by a sponsored message, so that usage will generate revenue for the organisation. A second objective of an information service is to draw attention to other services that would otherwise be missed by the majority of the users online. Finally, the information service may be set up to establish the image of an organisation as being knowledgeable in a specific area of expertise. For example, the food division of Unilever provides an online information service about Asian cooking, and the trade finance divison of Abn Amro bank provides an online information service about intemational freight transport.

In clear contrast to regular information systems, information services often operate in an environment of competition. For example, there are many competing organisations providing roadmap information services on their websites. F'ricing of information services in the presence of competition is a fruitful topic for micro-economists (for an overview of issues, see (Shapiro and Varian 1999)). Regular information systems do not have to operate under these circumstances, and therefore, they are much less vulnerable to market forces.

A third difference with infonnation systems is the content that is typically provided through an infonnation system. Regular systems are *work-related* in nature - they are designed to have instrumental value, and they are implemented to perform a task more effectively or more efficientely. Many information services, in contrast, are more *playful* in nature - they are there to engage in activities that are far removed from the office environment.

These differences with regular information systems suggest the need for new theory in information systems research: a theory about the drivers of online informatton service usage. In this paper, we address this need by developing a model around the attitudes and intentions of using online information services. We do so by taking traditional IS theories such as the

Technology Acceptance Model (Davis 1989; Venkatesh and Davis 2000) and the Triandis model (Thompson, Higgins et al. 1991) as starting points. We then theorise (1) that affect and perceived ease of use are more important than usefulness, and (2) that gender and experience will not make a significant difference in people's evaluation to return. These hypotheses are then tested with a quantitative study in which users of an online information service were the respondents.

Thus, the work contributes to a better understanding of online information services in three ways. First, we test an updated model of IS usage that is applicable to online information services. Second, we demonstrate the differences with regular information systems, both conceptually and empirically. And third, we provide a sprmgboard for new research opportunities in this stimulatmg area of IS research.

The rest of this paper is structured as follows. In the next section, we develop the framework and the hypotheses. We then empirically test a number of hypotheses around this framework with a real-life online information service. The method for doing so is described in more detail in section 3. Section 4 presents the findings from the empiricial study, and section 5 dicusses the results. Finally, we provide the limitations of our work and point at some useful areas for further research.

THEORYANDHYPOTHESES

In order to develop a theory on the personal usage of online information systems, we adopt the following strategy. First, we take existing models on information systems usage and apply these to the use of information services. The resulting model thus treats a service as an instance of an inforrnation system. Then, we theorise about the differences with regular information systems and online services. Each line of reasoning ends with a corresponding set of hypotheses.

The model for the usage of online information services is depicted in Figure 1. The backbone of this model is taken from the Technology Acceptance Model (TAM), clearly the dominant perspective for inforrnatton system usage in the past decade (Davis 1989; Venkatesh and Davis 2000). The original version of TAM is rooted in an early version of the Theory of Reasoned Action (TRA), a well-established socio-psychological theory which postulates that attitudes and intentions are formed through a cognitive appraisal of beliefs (Fishbein and Ajzen 1975). In TAM, people's intention to use an information system is derived from two beliefs: "perceived usefulness" and "perceived ease of use". lnterestingly, the original introduction to TAM does away with the "attitude" construct, which is supposed to mediate the belief / intention relationship (Davis, Bagozzi et al. 1989)'. Thus, empirical evidence has found a "belief' --> "Intention to use" --> "use" relationship, with no added value in adding a separate attitudinal construct.

[1] An elegant way to resolve this theoretical anomaly is to treat perceived usefulness and perceived ease of use as *attitudes* rather than beliefs. However, such a claim would need further theoretical and empirical justification beyond the scope of this paper

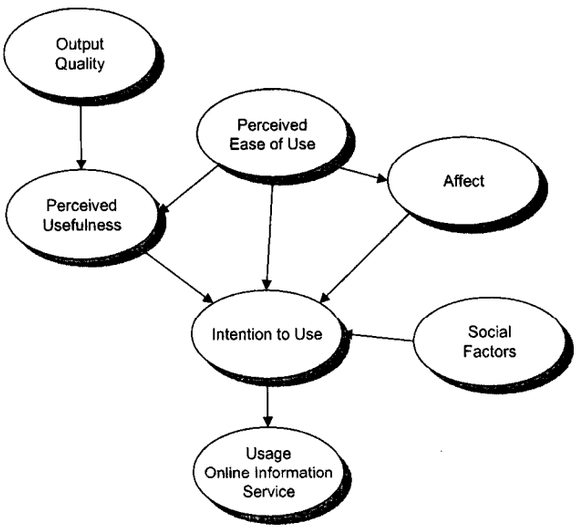


Figure 1 Conceptual model for understanding the use of online information systems (based on (Thompson, Higgins et al. 1991; Venkatesh and Davis 2000))

The conceptual model is augmented by a different perspective to understand personal information system usage, which is based on the work of socio-psychologist Triandis (Triandis 1980). This perspective is a complement to TAM in the sense that it too builds upon cognitive appraisals, but adds several other potential predictors. In its application to information system usage, these are the role of "social pressure" (i.e. what other people significant to the user think about using this system) and the role of "affect" (i.e. the affective appraisal associated with using a system). The Triandis model is not applied as widely as TAM, but both social pressure (subjective norms) and affective attitudes have found their way into recent versions of the Theory of Reasoned Action (Ajzen 2001). Likewise, in extensions to TAM the roles of affect (often portrayed as "perceived enjoyment") and social factors have been examined (Davis, Bagozzi et al. 1992; Taylor and Todd 1995; Taylor and Todd 1995).

From the model in Figure 1 we derive two sets of testable hypotheses. First, the direct predictors of intention to use an information service are considered. These are perceived

usefulness, perceived ease of use, affect, and social pressure. Each of these variables is hypothesised to have a positive influence on the intention to use an online information service.

Hypothesis la-d

Perceived usefulness (a), perceived ease-of-use (b), affect towards the information service (c). and social pressure (d) positively influence the intention to use an information service

The second set of hypotheses considers the indirect predictors of intention to use an information service. In line with TAM-2, the model focuses on output quality and perceived ease of use as predictors of perceived usefulness. Futhermore, it is argued that ease of use positively influences the affect towards using an information service, cf. empirical research done by (Davis, Bagozzi et al. 1992).

Hypothesis 2a

Perceived output quality and perceived ease of use positively influence perceived usefulness

Hypothesis 26

Perceived ease of use positively influences affect towards using an information service.

It should be noted that the empirical evidence on the role of affect demonstrates mixed results, and has not been without measurement problems (Thompson, Higgins et al. 1991; Thompson, Higgins et al. 1994; Paré and Elam 1995). Typically, there is 1) low reliability of the affect construct, 2) a high degree of multi-collinearity between cognitive and affective drivers (this is supported by the theory that people tend to co-align their feelings with their thoughts over time), and 3) a relatively modest influence of affect on people's intention to use computers - if at all. However, recent research on the role of affect towards using the intemet demonstrates higher predictive value of affect for "playful" infonnation services. Atkinson and Kydd found that the influence of affect is significant for entertainment use of the internet (Atkinson and Kydd 1997). Affect played a significant (though not a major) role in an TAM

study on the internet by (Teo, Lim et al. 1999). Other TAM-Internet studies are consistent with these findings (Lederer, Maupin et al. 2000; Horton, Buck et al. 2001; Moon and Kim 2001).

Social psychology suggests that the relative importance of cognitive and affective appraisals depends on characteristics of the attitude object. Objects that carry instrumental characteristics evoke more cognitive responses, whereas those that carrly less instrumental characteristics evoke more affective responses (Ajzen 2001). Empirical research in consumer behaviour has demonstrated this effect for consumer products. ***Hedonic*** is the term often used for products that have no instrumental value, whereas the term *utilitarian* is used for products that have functional value (Hirschman and Holbrook 1982). Particularly noteworthy is the recent study by Kempf who demonstrated that evaluation of functional software (a grammar checker) is based on cognition whereas evaluation of hedonic software (a computer game) is based on affect (Kempf 1999). Based on this resarch, it follows that:

Hypothesis 3

The influence of affect on the intention to use hedonic information services is stronger than the influence ofperceived usefulness.

The relative importance of ease of use and affect in the detennination of an attitude depends not only on the charateristics of the attitudmal object, but also on the characteristics of the individual (Ajzen 2001). Irrespective of the object that is evaluated, people vary in their disposition towards more cognitive or more affective evaluation (Haddock and Zanna 1998). In this regard, the discriminating role of gender has been subject of much discussion. Previous research in management information systems provides evidence that gender does play this role in explaining perceptions towards information systems. For example, men's usage intentions are more strongly influenced by perccptions of usefulness of women's (Venkatesh 2000). Whether women's usage intentions are more strongly influenced by affective appraisals remains an open issue. It is therefore appropriate to examine whether gender influences the relationship between affect, ease of use and people's intent to use online information services.

Another important moderator for the relationships between attitudes and intentions is user experience. Earlier studies in technology acceptance have consistently shown that experience with computers alleviates the impact of cognitive and affective evaluations on usage intentions (Thompson, Higgins et al. 1994) (Taylor and Todd 1995; Venkatesh and Davis 2000). It is logical to postulate the same hypothesis for the usage of onhne information services as well.

In sum, we arrive at the following hypotheses:

Hypothesis 4

The influence of usefulness (a). ease of use (b) and affect (c) on the intention to use online informntion services are equalfor male and female users.

Hypothesis 5

The influence of usefulness (a), ease of use (b) and affect (c) on the intention to use online information services are equalfor inexperienced and experienced users

The next section will expand upon the empirical evidence that was collected to test these hypotheses.

METHOD

Empirical setting

To test the hypotheses developed in the previous section, a quantitative study design was adopted with a hedonic information service, which was presented through a publicly accessible website. After consideration of a number of websites, we selected a website that offered information on movies. The site provides information on new premieres and on the daily agendas of movie theatres in large Dutch cities. Additionally, the website gave the latest information about moviestars (under the heading "gossip"), and provided opportunities for downloading ringtones and designing mobile phone logo's. The appendix provides two screenshots of the moviesite, which were taken during the time the survey was conducted.

At the time of research, the information service had 14920 registered users in its user database. We selected 5500 random users from this population to target for the survey. Because only an e-mail address was required to register, the only way to approach these users was tbrough their e-mail addresses. Therefore, we sent e-mails with an invitation to participate. The survey itself was located on a webserver, and a URL-link to this server was provided in the invitation. To preserve controlled sampling as much as possible, this link was referenced with the server's IP-number (to avoid domain name guessing and search engine incorporation) and it was not published elsewhere at all.

Measures

The cognitive measures used for this study are perceived usefulness and perceived ease of use. Perceived ease of use was taken from the updated TAM model (Venkatesh and Davis 2000). Affect is measured using two measures: one from (Compeau, Higgins et al. 1999), and one using four semantic differentials which were based on (Chang and Cheung 2001). *Intention to use* is again taken from the TAM model.

We wanted to adopt the perceived usefulness instrument from TAM-2 as well, if only for the sake of preserving direct comparison between other research. However, these items could not be tuned well to the hedonic nature of the information service. For example, a question such as "Using the online information service would improve my performance on the job" is a bit awkward when the online service is about the latest moviestar gossip. For this reason, we decided to adapt the items in the spirit of the original versions. This was done by asking people to what extent the use of the service would help them make better decisions about which films to go and see. This preserved the utilitarian, goal-oriented, cognitive nature of the instrument.

Because the website is in Dutch, the potential respondents are very likely to be Dutch natives. Consequently, conversion of the measurement scales into the Dutch language was deemed required. To avoid language bias, we conducted a backtranslation of the measures. First, the items were translated by the author. This translation was then reviewed by a Dutch colleague outside the IS field. The resulting questionnaire was then translated back into English by an independent translator who was not aware of the original mstruments. Fmally, a native speaker (of US. origin) verified the original translation with the backtranslation and evaluated whether each item conveyed the same meaning. This procedure is to be repeated if major inconsistencies are found, but no inconsistencies came up in the present study.

RESULTS

Sample

The set of e-mails that were selected from the user database contained 2 illegal addresses that the mail server was not able to parse. The other addresses were technically valid (i.e. parsable) and the mail server was able to sent out the invitations using these addresses. 166 addresses bounced after this excercise, implying that either the user name did not exist, the domain name did not exist, or the e-mail box of the user was full. So, eventually 5332 e-mails (97%) have been sent succesfully to existing e-mail addresses.

1144 users retumed our survey, which is 21.5% of the sample. This response rate is comparable to mail surveys and was deemed satisfactory for our purposes. The appendices contain figures which display the course of response over the days and over the time of day. The majority of responses was received during the first two days. This may be typical for intemet surveys, as users appear to decide whether to participate or not immediately after reading the invitation.

The following table provides some key demographic characteristics of the respondents.

Table 1 Demographics of respondents

Gender		Number	Percent
	Male	480	42%
	Female	658	58%
Age			
	Mean (standard deviation)	27 (10.3)	
	Median	25	
	Minimum and maximum	11, 61	
	Respondents younger than 18 years	189	17%
Education			
	High school	270	24%
	Lower education	316	28%
	Medium education	325	28%
	Higher education	173	15%
Genera1 intemet experience (self-reported)			
	Very inexperienced	6	1%
	Inexperienced	24	2%
	Slightly inexperienced	25	2%
	Neutral	102	9%
	Slightly experienced	258	23%
	Experienced	398	35%
	Very experienced	324	28%

There is a disproportional number of young female respondents in the sample, as the following figure shows.

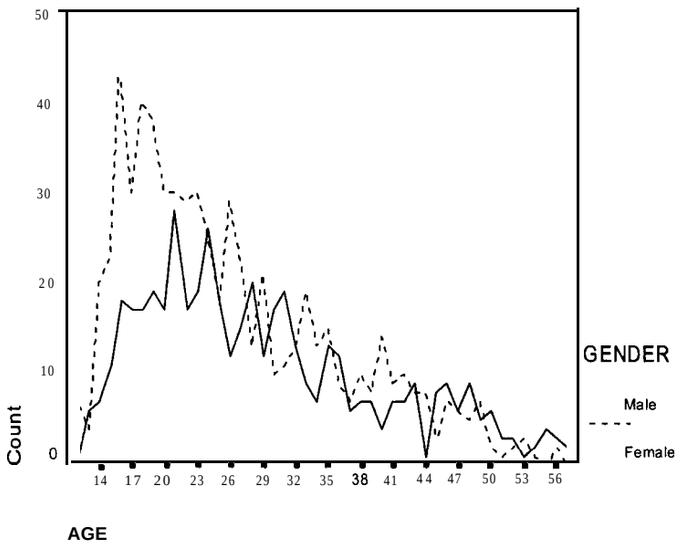


Figure 2 Respondents by age and gender

Experience with the information service was measured by asking since how long the repondent made use of the website. The following table displays the descriptive results.

Table 2 Experience with online information service

Frequency of visiting the online information service	Number	Percent
Multiple times per day	25	2
About once per day	87	8
Multiple times per week	263	23

About once per week	365	32
Multiple times per rnonth	224	20
About once per month	116	10
Multiple times per year	54	5
About once per year	10	1

Construct reliability and model validity

To examine the rehability of the constructs we computed Cronbach alphas for each of them. These are depicted below.

Description	Number of items	Cronbach Alpha
Intention to use	2	0.87
Perceived usefulness	5	0.90
Perceived ease of use	4	0.87
Affect (Compeau, Higgins et al. 1999)	5	0.65
Affect (Chang and Cheung 2001)	4	0.86
Output quality	6	0.85
Social factors	3	0.79

Conform the guidelines by (Nunally 1967), all measures approximate or exceed 0.80 and therefore they are more than acceptable. The one exception is the affect construct taken from (Compeau, Higgins et al. 1999). An exploratory factor analysis (EFA) on the Compeau instrument revealed two factors. The first factor had an alpha of 0.70. EFAs on the other constructs revealed unidimensional constructs only. For these reasons, we decided to adopt the Chang construct for affect in the remainder of the analysis.

In order to test the hypotheses developed in the previous section, three models were estimated using structural equation modelling (SEM). The software package used was Amos 4.01 (Arbuckle and Wothke 1999). Tbe first set of hypotheses postulate direct and indirect relationships irrespective of gender and experience. Hence, we estimated the model with all 1144 responses, using maximum likelihood estimation. The second and third set of hypotheses postulate differences in relationships for different groups. To cater for these hypotheses, we estimated two more groups with multi-group analyses. The validity of these models was examined using a representative set of standard SEM fit criteria (Hair, Anderson et al. 1998). The performance of the three models on these criteria are depicted in the following table.

	Acceptable level (Hair, Anderson et al. 1998)	Model 1: All respondents	Model 2: Multi-group by gender	Model 3: Multi-group by experience
Chi-Square	n.s.	1632 (d.f. 242, p < 0.000)	2007 (d.f. 484, p < 0.000)	2855 (d.f. 968, p < 0.000)
RMSEA	**< 0.08**	0.07	0.05	0.04
NFI	**> 0.90**	0.98	0.98	**0.97**
TLI	**> 0.90**	0.98	0.98	0.98

Table 3 RMSEA = Root mean square error of approximation, NFI = Normed Fit Index, TLI = Tucker-Lewis index

Hypotheses

The results of model 1 are displayed in Figure 3. The path coeftïcients can be used to test our hypotheses 1 and 2. Based on their strength, the data supports hypotheses la, lb, and 1c, as well as hypotheses 2a and 2b. The data does not support hypotheses 1d, which postulates a positive relationship between social factors and intention to use. Hypothesis 3 is also

supported because the standardised path coefficient for affect is greater than the one for usefulness (0.24 vs. 0.16).

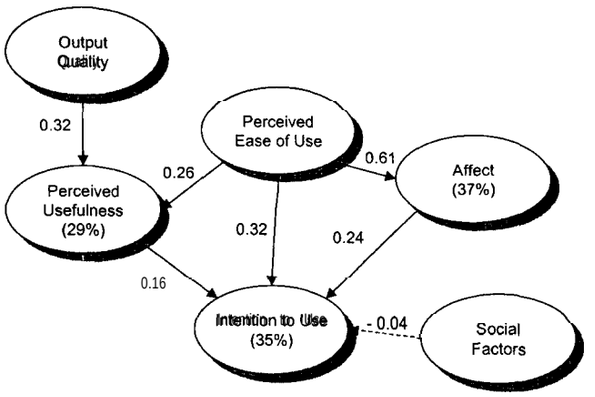


Figure 3 Results for model 1 (n = 1144). Only latent variables are sbown. All paths show standardised coefficients. Paths arep < 0.001 except for dotted path. Percentage indicates variance explained (i.e. sqnared multiple correlation)

For hypothesis 4, we estimated a multi-group SEM model with two groups: male and female users. All paramaters were set free, i.e. we did not set the coefficients to be the same for each group. The following table displays the standardised path coefficients of the predictors for intention to use.

Table 4 Standardised path coefflcients for male and female users of online information services

	Male (n = 480)	Female (n = 658)
Usefulness -> Intention	0.16	0.16
Ease of use -> Intention	0.32	0.33
Affect -> Intention	0.25	0.23

As can be seen from this table, the regression coefficients are almost exactly the same for each group. This implies that the data does support our hypotheses 4a, 4b and 4c that usefulness, ease of use, and affect do not differ signficantly across gender.

Table 5 Standardised path coefficients for inexperienced and experienced users of online information services (alpha = 0.005)

	Very inexperienced (n = 64)	Inexperienced (n = 340)	Experienced (n = 628)	Very experienced (n= 112)
Usefulness -> Intention	0.44	0.16 (n.s.)	0.10 (n.s.)	0.14 (n.s.)
Ease of use -> Intention	- 0.37 (n.s.)	0.25	0.39	0.66
Affect -> Intention	0.55	0.23	0.23	- 0.04 (n.s.)

This table demonstrates how the cognitive-affective balance develops as the respondent becomes experienced with the online information service. None of the hypotheses 5a, 5b and 5c are therefore supported. In fact, the data suggests a development for each of the variables. lnexperienced users place high ımportance on affect and usefulness, and do not care for ease of use in their decision to return to the website. Affect then gradually subsides as a predictor for future use, and usefulness does too, but even more dramatically. Ease of use becomes the most dominant predictor the higher the experience of the users with the online service.

DISCUSSION

The conceptual framework developed in section 2 is partly supported by the empirical evidence. Generalising across all respondents, the intention to use an online information service is a function of perceived ease of use, affect and perceived usefulness - in that order of importance. Both affect and perceived usefulness are strongly influenced by perceived ease of use, and output quality is a strong predictor of perceived usefulness. Social factors did not significantly influence people's intention to use the information service. Also, there was no significant difference in cognitive-affective pattems between male and female users, but there was a intriguing difference between inexperienced and experienced users. Inexperienced users are driven by affect and perceived usefulness, and experienced users are driven by perceived ease of use.

It is interesting to compare the overall results of our model with similar studies in the domain of infonnation systems research. The variance explained in user intentions using the TAM-2 model ranged from 34% to 52% (Venkatesh and Davis 2000). Our own result (35%) is comparable with this, but since our model was supplemented by an additional independent variable (affect), we might have expected a higher result. The TAM-2 researchers found the variance explamed in perceived usefulness ranging from 40% to 60%. Our own result is lower (29%), but this is achieved using only two variables (output quality and perceived ease of use). The TAM-2 researchers used a superset of independent variables (including for instance subjective norms, image, job relevance, and result demonstrability), all of which help to increase the variance explained.

The non-significant relationship between social factors and intention to use is clearly deviant from past research in inforrnation systems. In part, this is an artefact of the instrument that was employed. Many respondents reacted highly negative to the questionnaire items on social factors. This reduced the spread of responses, and this, in turn, reduced the power of the items to explain intention to use. But there are also arguments available for this result. First, using

this online information service is voluntary to a very high degree. It is neither mandatory nor necessary to use this specific service. This alleviates the importance of any social pressure. Second, this information service is designed to be for personal use, not for community use. The fact that the service was not reliant on the efforts of others in a user community decreased opportunities for social pressure to arise. Third, using this information service is not as visible in a social network as using a general technological artefact such as the computer, a mobile phone or a personal digital assistant. This lack of visibility, again, may decrease the opportunity for social pressure to arise. Whether any these arguments hold is a fruitful topic for further research. One could contrast mandatory usage versus voluntary usage, community usage versus personal usage, and socially visible usage versus socially invisible usage.

As theorised, the importance of affect and ease of use in the explanation of intention to use was higher than the importance of usefulness. Undoubtely, this result has its origin in the playfulness of the information service under study. The importance of ease of use is striking, much greater than in other studies in information systems usage, but in line with TAM studies on the genera1 usage of the intemet (Teo, Lim et al. 1999). Why would ease of use and affect be so overarchingly important in the use of online information services? One explanation could be that ease of use and affect were the only differentiating characteristics available to this information service. The content itself (movie agendas, moviestar gossip) could have been retrieved from other sources. So, the infonnation per *se* is not a source of competitive advantage, and this leaves the service provider with no other choice than competing on ease of use and affect. Similarly, on the demand side, users do not value usefulness in their decision to use the service (they can get the information anywhere else), but ease of use, and to a lesser extent, their affect with the service. In line with this argument, information services providing information in a monopoly or oligopoly setting would be appreciated much more on their usefulness than those who operate in settings of (almost) perfect competition. Further research could validate the implications of this argument by looking at information services in different economic environments.

Male and female users were found to possess the same cognitive-affective pattem in their intentions to use online information services, This contrasts with earlier studies who found that female users place less value on perceived usefulness (Venkatesh 2000). The fact that we could not find any marked difference between males and females in a setting where this difference had any opportunity to manifest itself (58% was female) deserves some additional research. It may be that the differences between information systems and information services (as discussed earlier) account for the contrasting findings.

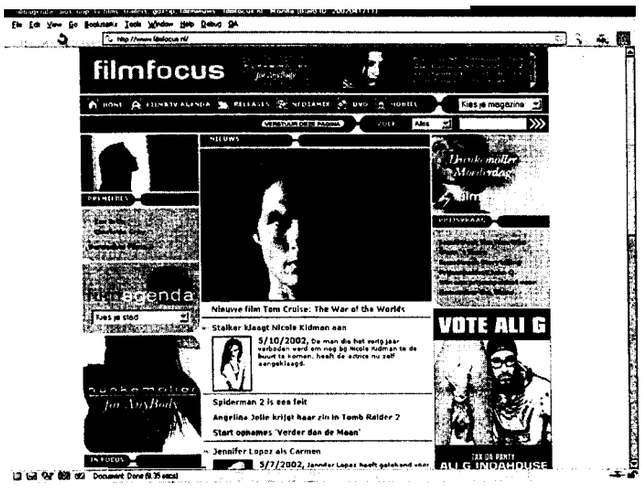
Our final result is the moderating role of experience in the cognitive-affective structure of individuals. Our results are in line with, and extend earlier research on the role of experience in information system usage (Taylor and Todd 1995). The role of perceived usefulness diminishes as users get more experienced with the system. Our results indicate that affect too is important for novel users, and that ease of use grows in importance for experienced users. The findings on experience paint the following picture. New users of information services struggle with the added value of the service. It is important to them whether the service is useful to them, and whether they have high affect with the service. In a completely voluntary setting, users *self-select* themselves on these parameters. In other words, there are no experienced users who do not find the service useful or affective -> these users simply cease to use the information service. As users gain more experience, they tend to take usefulness and affect for granted. In this situation, experienced users are no longer driven by usefulness or affect, but by ease of use. Summarising, online information services in voluntary and perfectly competitive settings *compete* on *added* ***value*** for inexperienced users and they *compete* on *ease* of *use* for experienced users.

It is, of course, a limitation that we have studied only one online information service and that both the content of the present service as well as its environment have influenced the results: our research, like many of our predecessors, has fixed the conditions set by the features of the online information service and the environment in which it was operating. We believe more research would be required to give insight into the way that manipulation of these settings would influence the cognitive/affective structure of people using information services. For

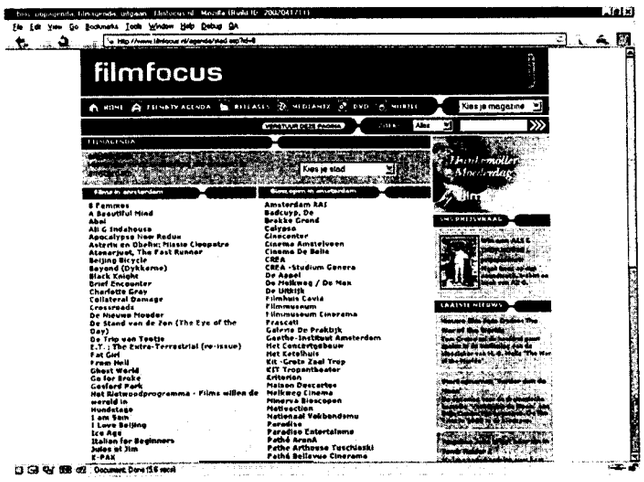
this reason, we encourage researchers to develop a more complete picture of the way these services may or may not proliferate. There are good opporhmities for more cumulative work in this area.

SCREENSHOTS

Home-page of the website.



Searching a movie or a movie-theater (example shows movies in Amsterdam).



TRANSLATED SURVEY INSTRUMENT

Output quality (7-point Likert scale, ranging from very bad to very good). Adapted from (Venkatesh and Davis 2000)

- Topicality of the information
- Reliability of the information
- Completeness of the information
- Correctness of the information
- Speed with which you can retrieve information
- Ease with which you can retrieve information

Perceived usefulness (7-point Likert scale, ranging from highly disagree to highly agree). Developed specifically for this research.

By using <the service>

- 1 can decide more quickly and more easily which movie I want to go see than in the past
- I can better decide which movie I want to go see than in the past
- ... 1 am better informed about new movies
- . I can decide more quickly and more easily whether I want to go see a particular movie or not
- 1 can better decide whether I want to go see a particular movie or not

Perceived ease of use (7-point Likert scale, ranging from highly disagree to highly agree) (Venkatesh and Davis 2000)

- The interaction with <the service> is clear and understandable
- Interaction with <the service> does not require a lot of mental effort

- I find <the service> easy to use
- I find it easy to get <the service> to do what I want it to do

Affect 1 (7-point Likert scale, ranging from highly disagree to highly agree) (Compeau, Higgins et al. 1999)

- I like working with <the service>
- I look forward to those moments that 1 need <the service>
- Once I arrive at <the service>, I find it hard to leave
- Using <the service> is frustrating for me (reverse scored)
- I get bored quickly when using <this service>

Affect 2 (7-point semantic differentials) (Cheung, Chang et al. 2000)

- Enjoyable – disguisting
- Exciting - dull
- Pleasant – unpleasant
- Interesting - boring

Social pressure adapted from (Taylor and Todd 1995)

- I use <the service> because my friends and family do so too
- I use <the service> because my friends do so too
- I use <the service> because other movie enthousiasts do so too

RESPONDENTS BY SUBMISSION DATE AND SUBMISSION TIME

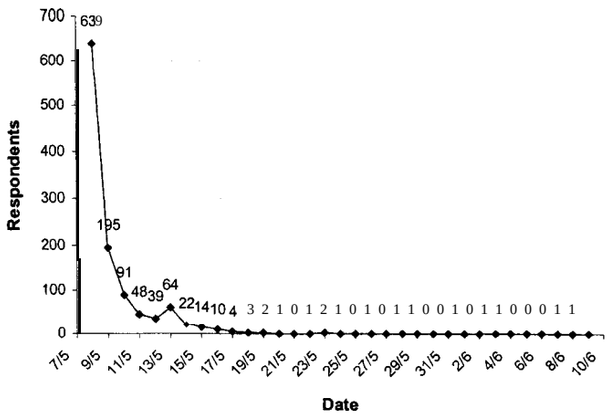


Figure 4 Respondents by submit date

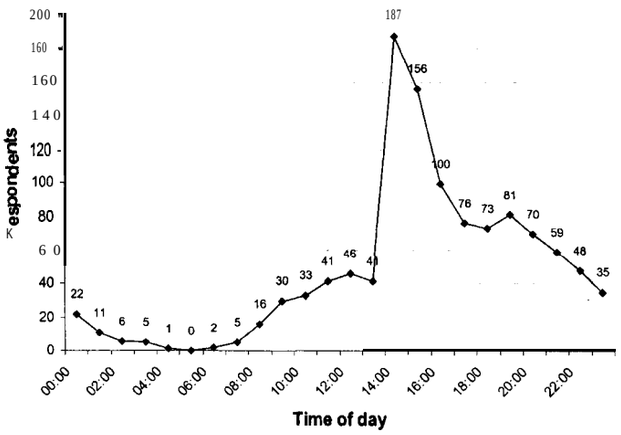


Figure 5 Respondents by submit time

Note the peak of responses at 15.00 hours, which reflects the time that the invitation was sent out (14.22 hom).

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