4 STUDY METHODOLOGY

This chapter gives an overview of the research methods, the development of the survey instrument and the personalised internet applications used for the evaluation. Furthermore, the procedure of the user evaluations is outlined. How were the study participants recruited and which were the data collection methods?

The study focuses on the influencing factors for satisfaction with personalised internet applications. Thus, three PIAs were used to test satisfaction of test persons and the hypothesised relationships. Based on the findings of this analysis, expert opinions were collected to obtain an additional point of view on the importance of the factors investigated and future possible developments.

4.1 Research Methods

4.1.1 Qualitative versus quantitative research methods

The first question arising is if for the intended study either a qualitative or a quantitative approach is more appropriate to solve the research question. The distinction between qualitative and quantitative approach which arises first, is that quantitative research methods use countable data. The aim is to collect data about quantifiable dimensions whereas qualitative techniques use "rich" information meaning words or pictures (Middleton, 1995). Thus, the gathering of data is different: quantitative data collection is limited to predetermined categories, obtains data for example through standard questionnaires whereas qualitative ones are not constrained to predetermined categories and use methods such as in depth-interviews (Neumann, 1997). What are the implications, advantages, shortcomings and the resulting areas of application of these statements? One of the most significant distinctions is that quantitative approaches permit statistical analysis but qualitative methodologies are less or not appropriate to collect quantifiable results (Myers, 2005). Thus, results of quantitative research are easier to compare and more precise whereas qualitative methods generally allow deeper insight in the subject to be investigated; for example it is possible to explore attitudes, feelings, perceptions (Skinner, Tagg, & Holloway, 2000). Quantitative methods are principally used to obtain

information about a large number of objects to be investigated whereas qualitative ones seem more appropriate for a collection of "rich" information about a smaller amount of objects to be investigated. Qualitative techniques are less useful if the aim of obtaining statements or generalisations about a relatively large population is pursued (Veal, 1994). However, both approaches are valuable and can complement each other.

4.1.2 Approaches Used in this Study

Both approaches are used in this study. A quantitative approach was applied to obtain a large number of user data to test the hypotheses named in the previous chapter. A web-based survey was used to collect user opinions about the personalised internet applications after the test persons had completed a pre-determined task.

Furthermore, qualitative expert opinions were collected to get a broader picture what might be important in the future and what are the challenges and opportunities for providers of PIA. Based on the results of the quantitative analysis of the user data, the experts were asked to give their opinions about current and future importance of each of the constructs as well as their perceptions of further important issues concerning personalised internet applications. The method of in-depth interviews was used. The qualitative research technique of the in-depth interviews allows getting deeper insights into experts' point of views, thoughts and perspectives (Guion, 2006).

4.2 Development of the Survey Instrument

First, a literature review was done to discover items which could be useful for the quantitative part of the study. For each of the research model's constructs about 15 items were chosen, translated and pre-tested. Two pre-tests were conducted to assure the proper realisation of the main survey. The goal of the first pre-test was to test which items are appropriate for the respective constructs. Approximately 150 students tested these items. After doing the first pre-test, the questions most appropriate were chosen. 4 to 6 items which loaded best were used to operationalise the constructs in the main survey. Furthermore, the web site providers were asked if they have additional questions they want to add and if yes, these were included as well. All the items of the main survey and the pre-

tests were measured on a 4-point Likert scale (ranging from "I totally agree" to "I totally disagree"). As soon as the questionnaire was designed the second pre-test was conducted focusing on the procedure and comprehensibility of the survey, the questions and the task. 15 colleagues and friends were asked if the pre-determined task and the questions are clear and understandable. The questions and tasks were slightly changed according to the results of the second pre-test.

The following table shows the questions used in the final questionnaire. They were either taken one to one from the source or more often they were slightly changed to fit the context. The questions were translated and they were re-formulated to be applicable for the specific web site, e.g. instead of "Using the web excites my curiosity." (Shang et al., 2005) the question "This web site excited my curiosity." was used.

Some questions were created because no appropriate questions used in previous studies were found (indicated in Table 10 as "own source"). Instead of using the term "personalised internet application" in the questions the more general term "web site" was used. It was assumed that the majority of the study participants do not have the knowledge what makes a personalised internet application different from a web site. Therefore, it was refrained from using this term.

Table 10. Constructs and their Measurement Items

Dimen-sion	Operationalisation	Reference
Ease of Use	Overall, I find this web site easy to use.	(Davis, 1989)
	This web site is user friendly.	(Muylle, Moenaert, & Despontin, 2004; Stone & Henry, 2003)
	It is easy to learn how to use this web site.	(Davis, 1989; Lewis, 1995)
	The structure of the web site is confusing.	(Muylle et al., 2004)

Dimen-sion	Operationalisation	Reference
Usefulness	Overall, I find this web site being useful.	(Davis, 1989)
	The use of Learn@WU / immobilien.net / Tiscover did facilitate my search for learning materials / real estate / a travel.	(Hsu & Chiu, 2003)
	This web site enables me to quickly find interesting information.	(Davis, 1989)
	This web site is increasing the quality of my information search.	(Hsu & Chiu, 2003; Stone & Henry, 2003)
Exploratory Browsing Behaviour	The visit of the web site offered me variety.	(Novak et al., 2000)
	This web site inspired me.	(Agarwal & Karahanna, 2000; 2005)
	This web site excited my curiosity.	(Agarwal & Karahanna, 2000; Baumgartner & Steenkamp, 1996; Novak et al., 2000; Shang et al., 2005)
	The use of the web site was exciting to me.	(Teo et al., 1999)
	The web site offered novel information / products to me.	(Richard, 2005; Skadberg & Kimmel, 2004)
	Using the web site was a pleasure.	(Teo et al., 1999)
Enjoyment	This web site induces new ideas.	(own source)
	This web site enhances my creativity.	(Novak et al., 2000)

Dimen-sion	Operationalisation	Reference
	This web site arouses my imagination.	(Agarwal & Karahanna, 2000; Novak et al., 2000)
Trust	This web site conveys the feeling that personal information is treated confidentially.	(Kim & Stoel, 2004; Wang, Tang, & Tang, 2001; Yoon, 2002)
	I trust the information indicated on the web site.	(Pavlou & Fygenson, 2006; Stewart, 2003)
	I have the impression that the web site www.immobilien.net / https://learn.wu-wien.ac.at / www.tiscover.at is secure.	(Wang et al., 2001)
	The web site seems like being equipped with the best security standards.	(Koufaris & Hampton-Sosa, 2004)
	The proposals (searching results) of the web site were convincing.	(own source)
Attitude	Information acquisition through the web is too time-consuming.	(Cheung et al., 2000)
	Information acquisition via the web is useful.	(own source)
	I think it was a good idea to use the web for that type of task.	(Hsu & Chiu, 2003; Suh & Han, 2002)
Experience / Internet Familiarity	I feel familiar with the web site because of previous usage.	(Gefen & Straub, 2004)
	How often do you use the WWW on average?	(Cheung et al., 2000; Lederer et al., 2000; Teo et al., 1999)
	Do you consider yourself as an experienced user of the WWW?	(own source)

Dimen -sion	Operationalisation	Reference
Satisfaction	I am satisfied with the outcome of my information search.	(McKinney, Yoon, & Zahedi, 2002)
	Overall, I made some positive experiences with the use of Learn @WU / www.immobilien.net / www.tiscover.at.	(Bhattacherjee, 2001)
	The quality of the proposals / searching results was convincing.	(Bauernfeind & Zins, 2006)
	This web site meets my expectations.	(Anderson & Srinivasan, 2003; Lewis, 1995)
	Overall, how is your impression of this web site? (global satisfaction item)	(McKinney et al., 2002)
Commitment	I can recommend this web site.	(Suh & Han, 2002)
	I will revisit this web site.	(Pavlou, 2001; Suh & Han, 2002)
	I will use this web site more often in the future.	(Suh & Han, 2002)

4.3 Internet Applications Used for Evaluation

The evaluation was based on three personalised internet applications. Some background information will be provided for each of them. Furthermore, the reasons why these particular systems from that particular industry were chosen will be outlined.

The three personalised internet applications have in common that they offer assistance and guidance to the user through a variety of options. The below mentioned web sites were not chosen arbitrarily but because they stem from different areas: Tiscover from tourism, Immobilien.net from the real estate

business and Learn@WU is a distance learning platform. The selection does represent reality very well because the tourism and leisure industry is already one of the most successful areas in e-commerce. According to Marcussen (2006), the overall online travel market size in Europe is increasing continuously during the past years. In 2005, the online travel Internet sales in Europe amounted already to more than 10% of the market and was expected to increase to a share of more than 12% in 2006 (Marcussen, 2006). The e-learning sector is increasingly important and information and communication technologies (ICTs) offer new opportunities for distance learning (Cantoni, Cellario, & Porta, 2004; Ong, Lai, & Wang, 2004). Personalised service is particularly crucial in the e-learning environment (Chen, Lee, & Chen, 2004).

Another reason why these three personalised internet applications were chosen for evaluation is that they have different levels of personalisation and recommendation services. The degree of personalisation addresses the issue of how much the results can be tailored to the particular preferences and constraints of the user. For the online real estate platform the level of personalisation was the highest because there are numerous possibilities and functionalities to specify preferences and constraints. Tiscover, the travel web site enables the user to get a quite good amount of personalisation by offering extended search functions. Finally, the level of personalisation of Learn can be classified as low to medium depending on which functions the students are using.

Furthermore, the degree of risk involved and the personal effort when using the particular site is likely to be different. The level of risk is typically very high for the travel application since the products and services have high value for the customer but are rather intangible. The degree of risk for the real estate platform is considered to be medium to high because real estate are of high value as well but they can be visited before they are purchased. The degree of risk for Learn@WU is classified as low because often it is used as simple information providing tool not really suggesting items out of different alternatives. Another reason why these particular internet applications were chosen is the varying level of complexity. The level of complexity could be very high or medium for the travel and the real estate internet application depending on the task. The level of complexity is lower for Learn@WU because it is rather easy to get an overview which tasks can be performed at the web site and the number of available tasks is limited.

Table 11. Classification of the Personalised Internet Applications Tested

Personalised Internet Application	Level of Personalisation	Degree of Risk	Complexity
Tiscover	Medium-High	High	Medium - High
Immobilien.net	High	Medium - High	Medium - High
Learn@WU	Low-Medium	Low	Low - Medium

The following sub-sections will describe the respective personalised internet applications in greater detail. Furthermore, the reasons why particularly they were chosen for the evaluation are outlined.

4.3.1 Tiscover

Tiscover is a travel website offering information and/or online booking of separate parts of a travel i.e. accommodation or activity. Furthermore, complete travel bundles can be booked as well. The travel and leisure industry was an obvious candidate to be represented in this study because travel products and services receive rising attention on the WWW (Marcussen, 2006).

Why was the personalised internet application Tiscover chosen among all the online travel platforms? The web site provides advanced booking functions offering recommendation as well. Often, the possibilities to express interests, preferences and constraints are very limited with other systems (e.g. www.expedia.de, www.lastminute.com or www.allesreise.com). On the Tiscover web site many details can be specified and there is a great variety of interests among which the user can express his or her preferences and activities to be pursued during the vacation.

4.3.2 Learn@WU

The second PIA is Learn@WU (https://learn.wu-wien.ac.at/), the e-learning platform of the Vienna University of Economics and Business Administration (VUEBA). The platform has recently been re-developed, improved and offers

now the possibility for the students to personalise the interface. Students are increasingly using the opportunity to have an e-learning web site tailored to their respective courses and exams they are taking.

4.3.3 Immobilien.net

Immobilien.net is an online real estate platform on which real estate agencies can post their offers and users can search for real estates. This website was chosen because the searching functions are very extensive. Thus, the degree of personalisation can be very high if the customer is using the functions allowing tailoring proposals to his or her individuals' preferences and constraints.

4.4 Study Participants

The study participants asked to evaluate the specific internet applications were recruited in different ways. Students of the Vienna University of Economics and Business Administration (VUEBA) were invited to participate in the survey about Learn@WU. Several ways were applied to promote the survey and convince the students to participate in the survey. First, a pop-up was used at the web site Learn@WU to draw students' attention to the survey. Second, it was announced on the web site Learn@WU as well. Furthermore, a lottery served as an incentive for the students to participate in the study. Cinema vouchers were raffled among all students completing the survey and wishing to participate in the lottery.

Various announcements were done for the immobilien.net survey. First, an invitation to participate in the survey was sent to all e-mail addresses subscribed to the newsletter of immobilien.net. Second, the survey was announced at the immobilien.net web site. Third, two partner web sites of immobilien.net (www.job.at, www.partner.at) promoted the survey as well by means of banners. The incentive used for the immobilien.net survey was a raffle of furniture vouchers.

The survey of Tiscover was done in a similar way to the immobilien.net survey. All subscribers of the Tiscover newsletter got the invitation to answer the questionnaire about Tiscover. Furthermore, the survey was announced by banner

advertisements at the web sites of www.partner.at and www.job.at. Finally, the survey was sent via a snowball system to friends and relatives.

4.5 Experimental setting and data collection method

For the purpose of creating some degree of situational involvement for each of the personalised internet applications a pre-determined task was proposed. The test task was intended to mimic real problem solving, e.g. to simulate travel planning in the case of Tiscover, to prepare an exam with Learn@WU or to be recommended on a real estate search with Immobilien.net. At the same time sufficient degrees of freedom were kept to allow the test users to organise their web site visit how they liked and to navigate freely.

Test persons were asked to conduct the test task first and to continue with the answering of the questionnaire. The main body of questions included the items used for the research model. Questions about demographics and internet experience concluded the questionnaire. The respective tasks for each web site are outlined in Table 12. The German version of the questionnaire is found in the appendix.

The questionnaire itself and the respective constructs and questions were operationalised by pre-studies as already outlined. The survey was conducted with an online questionnaire tool (CIW by Sawtooth Software http://www.sawtoothsoftware.com/). The rows of the questionnaire were automatically randomised within the dimensions. The time taken for the realisation of the test task and the answering of the questionnaire was 15 minutes on average.

Table 12. Test Tasks for the Respective Internet Applications

Personalised Internet Application	Task
Immobilien.net	Imagine you want to move to another apartment within the next year. You prefer a rental apartment of 70m² which should be located in Vienna preferably in the districts 3.-9. The monthly rent should not exceed 600 Euro. Please look now for an apartment at the web site www.immobilien.net.

Personalised Internet Application	Task
Tiscover	Imagine you want to go on a one week holiday with a friend to Tyrol in September or October. You will travel to the destination by car or train. The total amount for the accommodation should not exceed Euro 1000 for both of you including breakfast. You would like to stay in a hotel with 3 stars at least. You can choose the date of the travel on your own. Now please open the web site www.tiscover.at and search for the accommodation (without booking).
Learn@WU	Imagine you want to attend the "Marketing I" exam at the Vienna University of Economics and Business Administration soon. Therefore, you want to get an overview of the exam with the help of the e-learning system Learn@WU. Now please open the web site https://learn.wu-wien.ac.at. Search for all relevant and interesting information concerning that exam.

5 EMPIRICAL RESULTS

This chapter consists of three major parts. First, descriptive results for the sample are presented and a comparison of the three personalised internet applications is conducted. Second, the structural equation modelling approach and its results are outlined for the total sample as well as for the sub-samples. Third, the method of expert interviews employed in this study is described and results are documented.

5.1 Descriptive Statistics

The descriptive statistics section includes the demographic description of the sample. Furthermore, the personal characteristics for the sample such as experience with the internet and attitude are outlined. Finally, the respective constructs are analysed descriptively to get an impression of how each of the respective areas, e.g. ease of use, satisfaction were evaluated.

Since various incentives were used to attract the attention of potential test persons there is the danger that some test persons completed the questionnaire just for the sake of winning one of the incentives. Therefore, the answers were checked for outliers to avoid that such cases are included in the final sample. The questionnaire contained one question formulated negatively ("The structure of the web site is confusing") belonging to the domain ease of use. This question was primarily used to discover datasets which were not based on serious answers (meaning people were participating in the survey just because they want to win a prize in the raffle and did not care which answer they gave). First, it was checked if people show some different answering behaviour between the positive formulated questions belonging to ease of use ("Overall, I find this web site easy to use", "This web site is user-friendly", "Learnability") and the fourth negative question. If not, the other questions were examined as well looking for inconsistencies. If it was detected that the negative formulated question was answered inconsistently (answered positively although the others were answered positive as well) and the others seem to be answered without really thinking about the web site too (e.g. the answers were mainly "I totally agree" or "I do not agree at all" regardless of the questions) those cases were excluded from further analysis. Furthermore, cases were excluded from the analysis if a respondent

seemed to answer just the same or nearly the same for all of the questions. However, this issue was not a big problem and only 4 cases were deleted from the final sample. Moreover, incomplete questionnaires were excluded as well if questions focussing on the constructs were not answered. Incomplete questionnaires were included if only demographic answers or provider specific answers (questions the web site providers wanted to add) were missing. Finally, the total sample size included 1386 completed questionnaires as outlined in Table 13.

Table 13. Sample Size

Web Site	Sample Size
Learn@WU	727
Immobilien.net	422
Tiscover	237
Total	**1386**

5.1.1 Demographic Description of the Sample

This sub-section is intended to give an overview of how the sample is composed. Table 14 presents the results for the gender distribution and how the various age groups are represented in the study at hand. Furthermore, the current profession and education is indicated (see Table 14).

As far as the distribution of gender is concerned, more female (56%) than male respondents (44%) participated in the survey. The sample can be classified as rather young with more than 60% being below 30 years.

Row 3 in Table 14 outlines the education levels of the respondents. More than 60% of the test persons have A-levels, followed by 15% who completed either an apprenticeship or a vocational school. Almost 20% of the respondents have a university or university of applied sciences degree. As far as the current profession of the study participants is concerned, the majority of the sample are students followed by employed persons and self-employed persons. For the demographic questions cases with missing values were accepted. Therefore, the sum in Table 14 does not always amount exactly to 100% of the sample.

Table 14. Demographic Characteristics of Respondents
(N=1386)

Demographic Characteristics	Frequencies	
	Absolute	Relative
Gender		
– Female	775	56%
– Male	609	44%
Age		
– 18-30	848	61.2%
– 31-40	238	17.2%
– 41-50	167	12.1%
– 51 and more	106	7.6%
Education		
– University	188	13.6%
– University of applied sciences	75	5.4%
– A-levels	886	64.0%
– Apprenticeship or vocational school	207	15.0%
– Compulsory Education	22	1.6%
Profession		
– Employed	440	31.8%
– Self-employed	106	7.7%
– Student	782	49.3%
– Retiree	40	2.9%
– Housewife/Houseman	27	2%
– Miscellaneous	85	6.1%

5.1.2   Personal Characteristics of the Sample

Further personal characteristics of the sample covered by the study are the attitude towards information search via the Internet and WWW experience or familiarity. Results for both of the constructs seem to be very positive. The test persons were quite experienced and the attitude towards information search via the WWW is positive.

5.1.2.1   WWW Usage and Experience

Two questions were used to find out how the general WWW experience of the test persons is. A third question aimed to investigate the test person's knowledge of the particular web site. Figure 14 describes how often the respondents use the WWW on the average. Nearly, three quarters use it daily, another 19% use it several times a week, the others less often.
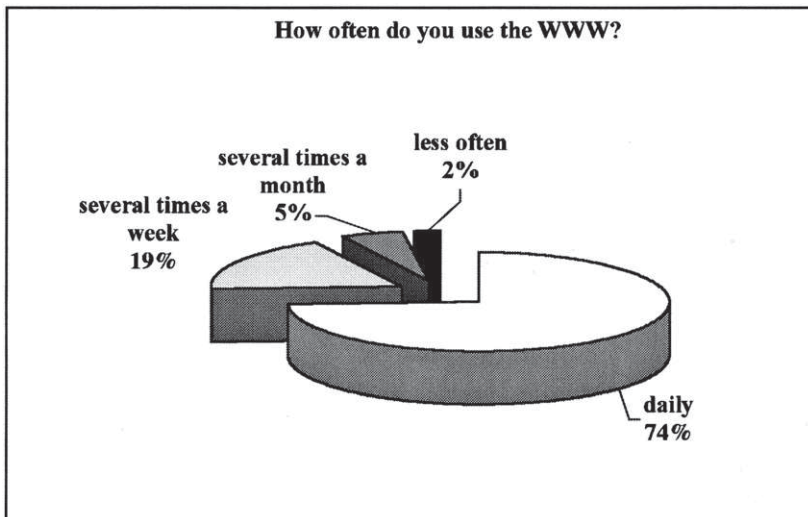

Figure 14. Average Use of the WWW

The next question focused on the self-assessment of the test persons of how experienced they are when interacting with the WWW. This additional question was applied because the frequency of usage itself does not give any cue of how confident persons are when browsing the Web. The results show that the majority sees themselves as experienced. A little bit less than one half of the test persons consider themselves as being a very experienced user (see Table 15).

Table 15. Self-assessment of WWW Experience

Do you consider yourself as an experienced WWW user?	Frequencies	
	Absolute	Relative
Very experienced	624	45.1%
Experienced	676	48.8%
Less experienced	73	5.3%
Not experienced	11	0.8%

The final experience question was related to the knowledge of the particular personalised internet application (Figure 15).
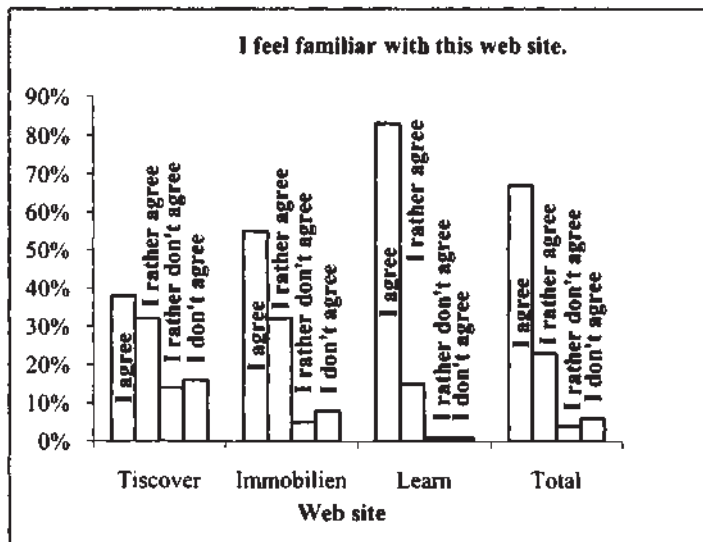
Figure 15. Self-assessment of Web Site Familiarity

The question outlined in Figure 15 was intended to capture the respondents' familiarity with the web site. This self-assessment question was chosen because asking how often they have used it would be problematic because the web site visits could be very short ones or could have taken place already a long time ago. Such a question would say nothing about the familiarity with the web site.

The statement was "I am familiar with the web site because of previous visits." Overall (for the whole sample), 66.5% felt very familiar with the web site, 23.4% being rather familiar. 10% of the respondents were rather not familiar or not familiar at all. Figure 15 shows the difference between the respective internet applications. Obviously, the familiarity differs for the three personalised internet applications. Learn is by far the system test persons were most familiar with followed by Immobilien. The web site Tiscover has with 30% the highest rate of being non-familiar or rather non-familiar among the respondents.

5.1.2.2 Attitude towards online information search

Overall the attitude of the respondents indicates that they consider information search via the WWW as being useful.
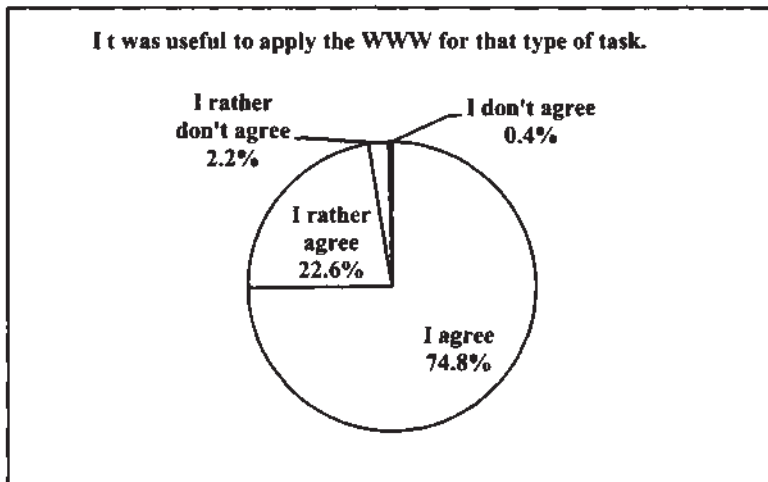

Figure 16. The Usefulness of the WWW for the Task

Three quarters of the test persons found the use of the Web helpful to solve the given task (see Figure 16). Only 25% of the respondents agreed that search via WWW is too time-consuming.

For the question "I found it useful to obtain information about real estate/ travel/ learning material via the WWW." it makes sense to have a separate look on the results for each of the web sites. Figure 17 shows that there are no main differences. However, the Learn@WU respondents found it most useful with nearly 80% agreeing on that question. The agreement of Immobilien.net test persons was high as well (74.5%); however it was the lowest level of agreement compared to the other two web sites.
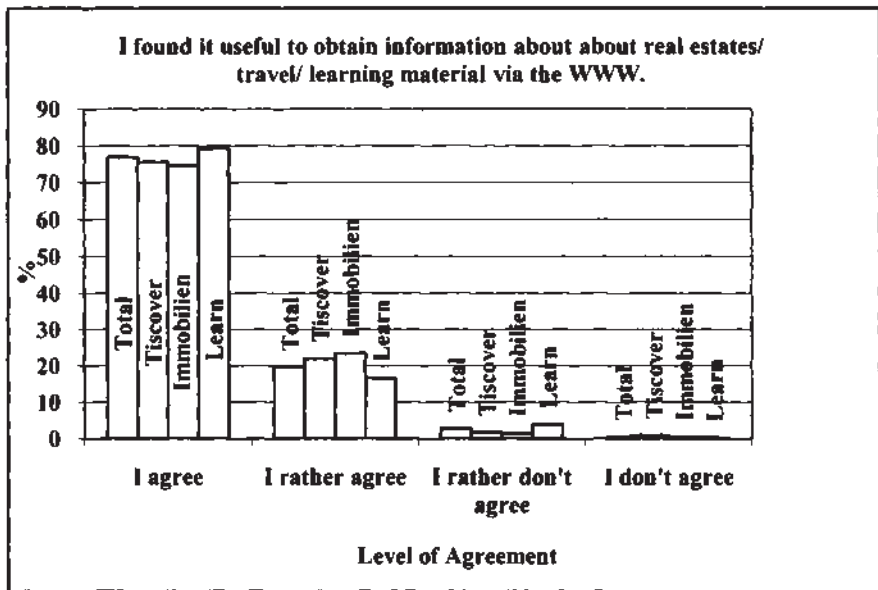

Figure 17. Usefulness of Obtaining Information via the WWW

5.1.3 Comparison of the three Personalised Internet Applications

Some descriptive construct analysis - an overview of how the respective constructs ease of use, usefulness, trust and exploratory behaviour were perceived by the respondents is given in the following section. The outcome, i.e. satisfaction and commitment will be described descriptively as well. Moreover, a comparison of the three systems will be realised.

5.1.3.1 Ease of Use

Table 16 shows the items for the construct ease of use. Overall, the results for ease of use were satisfactory with each question being agreed or rather agreed on an 80% level. The question about the structure of the web site being formulated negatively was disagreed with 80%.

Table 16. Items for the Construct "Ease of Use"

"Ease of Use"
• Overall, I find this web site easy to use.
• This web site is user friendly.
• It is easy to learn how to use the web site by new users.
• The structure of the web site is confusing.

The first ease of use question received the most positive answer in the total sample. 52.5% of the respondents agreed that the web site was easy to use. Almost 40% answered this question with I rather agree. Only 6.8 did rather not agree and slightly more than one percent disagreed. Table 17 presents the differences among the three web sites. Obviously, Tiscover received worse results for this question with only 43.5% of total agreement. Almost 15% rather not agreed and this is the highest level of disagreement for that question compared among the three web sites.

Table 17. Overall Ease of Use

Level of agreement	Personalised Internet Application		
	Tiscover	Immobilien	Learn
I agree	43.5%	53.2%	55.2%
I rather agree	40.1%	39.2%	39.5%
I rather don't agree	14.3%	6.1%	4.7%
I don't agree	2.1%	1.4%	0.7%

What are the results for the second item "This web site is user friendly"? The average result was slightly worse than for the first question with 49.4% totally agreeing that the web site is user friendly. However, the percentage of respondents who rather agreed was with 44.4 higher than for the first question.
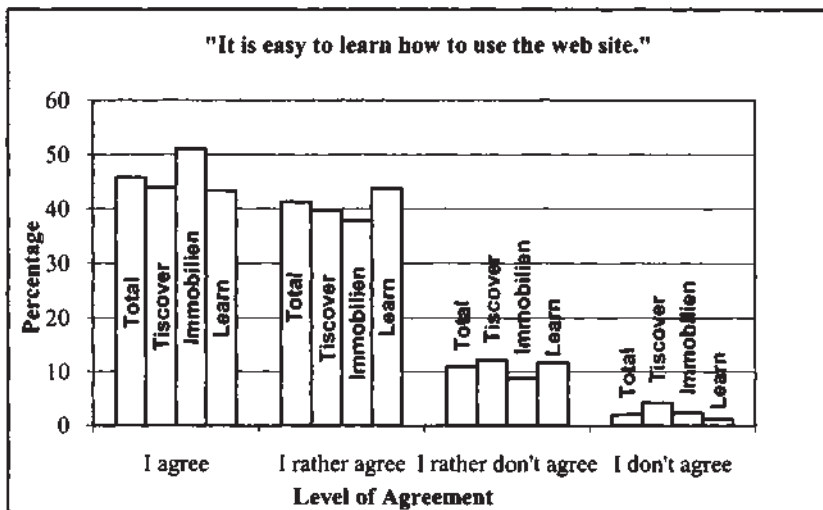

Figure 18. Learnability of the Web Sites

Another question was concerned with the test persons' opinion if new users can easily learn how to use the web site. The results were surprising for this question as the average outcome for the three systems applies more or less for Tiscover and Learn@WU as well. However, the web site www.immobilien.net is positively salient with nearly 90% of the test persons being convinced that it is easy to learn how to use the web site (see Figure 18).

The last question of the construct ease of use referred to the structure of the personalised internet applications. This statement was formulated negatively to check the respondents' attention as outlined in Section 5.1. 80% of the test persons disagreed, the disagreement was with 73% lower for Tiscover then for the other two web sites (Immobilien: 79% and Learn@WU 84%). Next, a closer look is taken on the construct of usefulness.

5.1.3.2   Usefulness

Usefulness being another indispensable characteristic of a web site is analysed in greater detail. This construct was measured with four items as indicated in Table 18.

Table 18. Items for the Construct "Usefulness"

"Usefulness"
• Overall, I find this web site being useful.
• The use of Learn@WU / immobilien.net / Tiscover did facilitate my search for learning materials / real estate / a travel.
• This web site enables me to quickly find interesting information.
• This web site is increasing the quality of my information search.

As far as the first question is concerned the composite usefulness (for all three web sites) is perceived by 68% as definitely useful. 29% of the test persons rather agreed (Table 19).

When it comes to look at the three web sites separately, there are no big differences regarding the agreement and the disagreement. However, a distinction can be drawn when looking at the respondents indicating that they

fully agree compared to those who rather agree. The web site Learn@WU is by far the one which is perceived to be most useful with 80% fully agreeing. Table 19 further outlines the differences among the web sites for this question of usefulness.

Table 19. Usefulness of the Web Sites

Level of agreement	Personalised Internet Application			
	Tiscover	Immobilien	Learn	Total
I agree	48.1%	58.4%	80.7%	68.3%
I rather agree	46.8%	38.5%	17.6%	29.0%
I rather don't agree	4.2%	1.4%	1.5%	1.9%
I don't agree	0.8%	1.7%	0.1%	0.7%

The answers to the second question were more differentiated across each web site. Learn@WU was obviously the web site being perceived very useful for the search of learning materials. Surprisingly, this time it was immobilien.net which got the worst evaluation (see Figure 19). However, this could be due to the fact that the online based search for real estate is not that widespread as it is for the travel sector or for learning materials.

Another item was concerned with the time frame – how quickly can the desired piece of information be found on the web site? At least 80% of the respondents agreed or rather agreed that they found useful information within a time being perceived by them as quick. Learn@WU and www.immobilien.net are performing better than Tiscover (with 19% disagreement for that question compared to 7% of Immobilien and 9% of Learn@WU).

The last question of usefulness refers to the quality of information search. The same picture shows up like for the previous question. The overall satisfaction with the quality of information search is about 90% but lower for the web site Tiscover with only 82%.
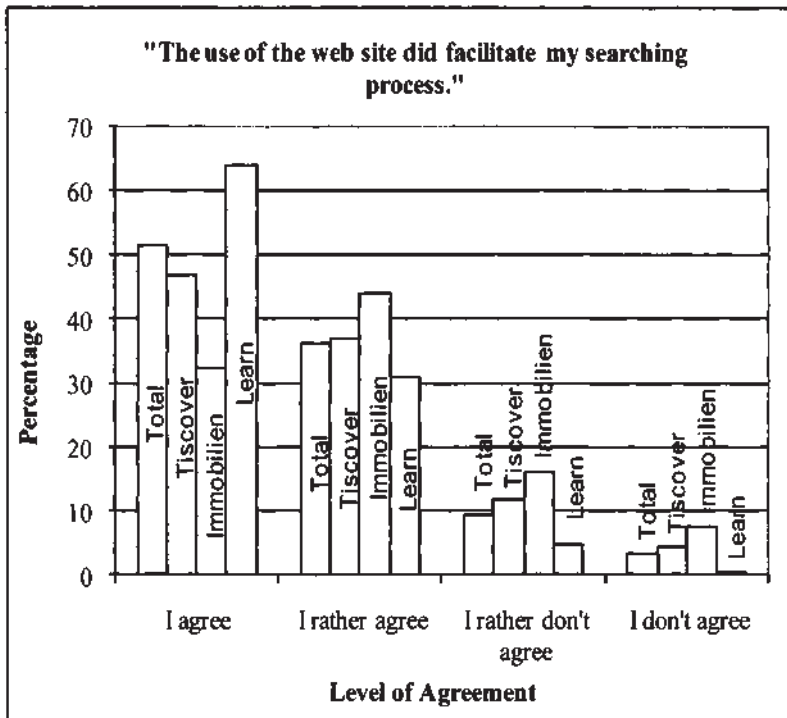
Figure 19. Facilitation of the Searching Process through Online Resources

The weaker results of Tiscover when compared to the other two web sites have to be put into perspective because the three personalised internet applications which were evaluated have different positions on the market. Learn@WU has a quasi-monopoly position because students studying at the Vienna University of Economics and Business Administration have no other choice if they want to use online learning material. The only option is to use conventional materials like offline books or scripts. In contrast, the competition for online real estate platforms is higher. When it comes to travel there are even more web sites being potential competitors. Furthermore, the assumption arises that different characteristics have distinctive significance for the respective sectors. For some web sites like an e-learning platform it is most important to be useful whereas for the travel sector trust and fun might have greater significance. However, this assumption will be tested and outlined in the section on Structural

Equation Modelling where the influences on satisfaction are analysed for each personalised internet application.

5.1.3.3 Enjoyment

Next, a totally different area is the subject: the construct of perceived enjoyment. Enjoyment is serving as a competing construct to exploratory browsing behaviour. It is hypothesised that the construct of exploratory browsing behaviour is the more appropriate one in the context of personalised internet applications. This is going to be tested in the section on Structural Equation Modelling.

Table 20. Items for the Construct "Enjoyment"

"Enjoyment"
• This web site induces new ideas.
• This web site enhances my creativity.
• This web site arouses my imagination.

Surprisingly, the positive results for the first question of enjoyment completely favour the travel web site Tiscover. More than 60% of the respondents agreed that the use of the web site creates new ideas in the case of Tiscover. Only 53% of the test persons thought that they created new ideas when using the web site www.immobilien.net. Learn@WU got 32% positive answers.

The second question of enjoyment "This web site enhances my creativity" reflects a similar picture, though differences among the web sites are not that strong. The average agreement amounts to 30%, Tiscover got 38% positive consent for that question, Immobilien.net even 40% and Learn@WU achieved 22% agreement of the respondents. Finally, when it comes to evaluate if the web site made the test persons feel imaginative, results are rather balanced except for Learn.

Table 21. Does the Web Site Create New Ideas?

Level of agreement	Personalised Internet Application			
	Tiscover	Immobilien	Learn	Total
I agree	24.1%	18.4%	6.2%	13.0%
I rather agree	37.1%	34.3%	25.7%	30.3%
I rather don't agree	29.5%	34.8%	51.4%	42.6%
I don't agree	9.3%	12.5%	16.6%	14.1%

A competing construct which is hypothesised to perform better than enjoyment when applying to personalised internet applications is exploratory browsing behaviour outlined in the following sub-chapter.

5.1.3.4 Exploratory Browsing Behaviour

Exploratory Browsing Behaviour which deals a lot with inspiration, novelty seeking, variety seeking and curiosity is hypothesised to be more appropriate because personalised internet applications should induce exploratory browsing more than ordinary web sites. They should present personalised results very soon to the user. Therefore, after having found appropriate proposals the user can move on with exploratory browsing, e.g. to find additional information on financing in the case of real estate or journey and infrastructure information in the case of the travel web site. Furthermore, the concept of exploratory browsing goes beyond just being a "fun" web site.

Table 22. Items for the Construct "Exploratory Browsing Behaviour"

"Exploratory Browsing Behaviour"
• The visit of the web site offered me variety.
• This web site inspired me.
• This web site excited my curiosity.

"Exploratory Browsing Behaviour"
• The use of the web site was exciting to me.
• The web site offered novel information / products to me.
• Using the web site was a pleasure.

For the first question, one quarter of the respondents agreed that the respective web site offered some variety. 43% of the test persons rather agreed and the rest of 32% did not or rather did not agree.
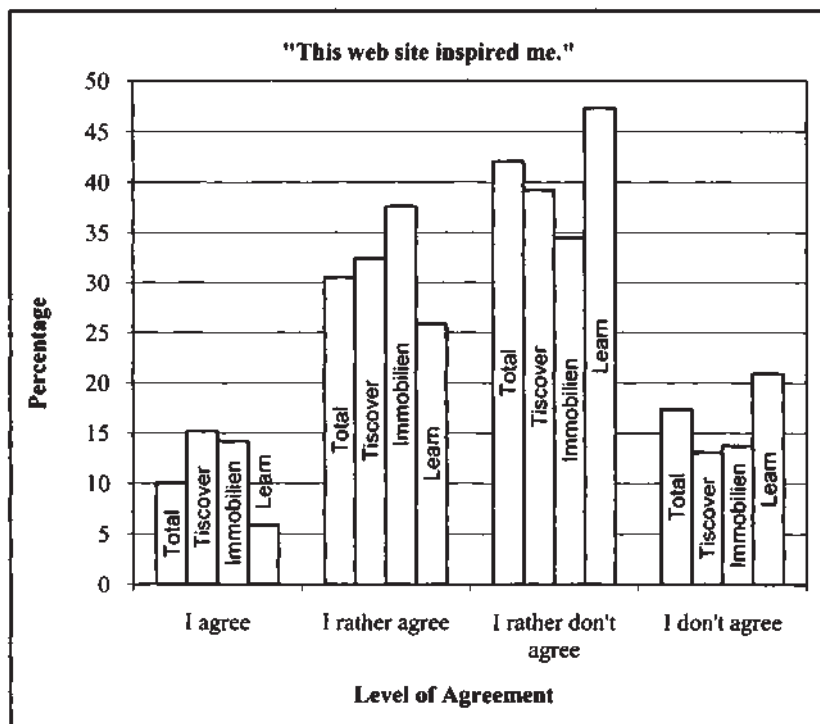

Figure 20. Inspiration of the Web Sites

The second question ("This web site inspired me.") showed some major differences when analysing the web sites separately. Although, the general agreement upon the inspiring function of the three web sites was not very high the perceived inspiration was higher for the web sites Immobilien.net and Tiscover. Both of them offer some inspiring content, additional information such as a guide or weather at www.tiscover.at or information about furniture or financing on the real estate web site. Nearly one half of the respondents agreed in the case of Tiscover and slightly more than one half for Immobilien.net while for Learn@WU it was just 32% of agreement. Certainly, this can be due to the fact that Learn@WU is rather used for goal directed purposes.

The question dealing with curiosity responding functions of the web site showed a similar picture like the previous question. Although being rated better than the inspiration question, Tiscover and Immobilien.net got better results than Learn@WU. Again, this is certainly due to the different purposes of the web sites.

As far as the question "The web site offered novel information / products to me." is regarded, the results turn in favour of Learn@WU receiving the best ratings with a level of agreement of more than 83% (compared to only 67% of Tiscover and 79% of Immobilien).

Table 23. Novelty of Information or Products

Level of agreement	Personalised Internet Application			
	Total	Immobilien	Learn	Tiscover
I agree	30.8%	28.4%	34.0%	25.3%
I rather agree	48.3%	50.1%	49.5%	41.8%
I rather don't agree	16.9%	16.5%	14.4%	24.9%
I don't agree	4.0%	5.0%	2.1%	8.0%

When looking at the overall ratings of the exploratory browsing behaviour questions it becomes evident that the inspiration question received the worst evaluations (see Table 24). The same turns out when the exploratory browsing behaviour assessments for all three personalised internet applications are regarded.

Table 24. Overall Ratings for Exploratory Browsing Behaviour Items

Level of Agreement	Question					
	Vari-ety	Inspira-tion	Curi-osity	Excite-ment	Nov-elty	Plea-sure
I agree	24.8%	10.0%	20.9%	17.2%	30.8%	18.8%
I rather agree	42.9%	30.5%	42.2%	38.6%	48.3%	48.9%
I rather don't agree	25.7%	42.1%	29.5%	34.4%	16.9%	25.9%
I don't agree	6.6%	17.4%	7.4%	9.8%	4.0%	6.4%

The other Exploratory Browsing Behaviour items got a level of agreement of approximately 60% except excitement which got positive ratings of 55.8%. Novelty-seeking was by far the item receiving best ratings with 79% of the respondents agreeing that the web site offered novel products or information. The second most popular items were variety and pleasure being rated positively by 68%. Next, the focus is upon a serious subject not related to fun and hedonic motivations at all – the issue of trust.

5.1.3.5 Trust

The final construct of the independent, exogenous constructs is trust which is hypothesised to be substantial considering the ongoing and increasing internet fraud cases and caveats. Table 25 displays the items used to measure trust.

Overall, the construct of trust is rated good because the level of disagreement is not exceeding 20% for none of the items. Another recurring result is that Learn@WU is almost always assessed best in terms of trust and security standards when compared to the other two.

Table 25. Items for the Construct "Trust"

"Trust"
• This web site conveys the feeling that personal information is treated confidentially.
• I trust the information indicated on the web site.
• I have the impression that the web site www.immobilien.net / https://learn.wu-wien.ac.at / www.tiscover.at is secure.
• The web site seems like being equipped with the best security standards.
• The proposals (searching results) of the web site were convincing.

If a closer look is taken at the results for trust, the question referring to trust towards information is evaluated best. Learn@WU is by far the one being assessed most positively with more than 95% agreement (compared to almost 90% of Immobilien.net and Tiscover) as shown in Figure 21.
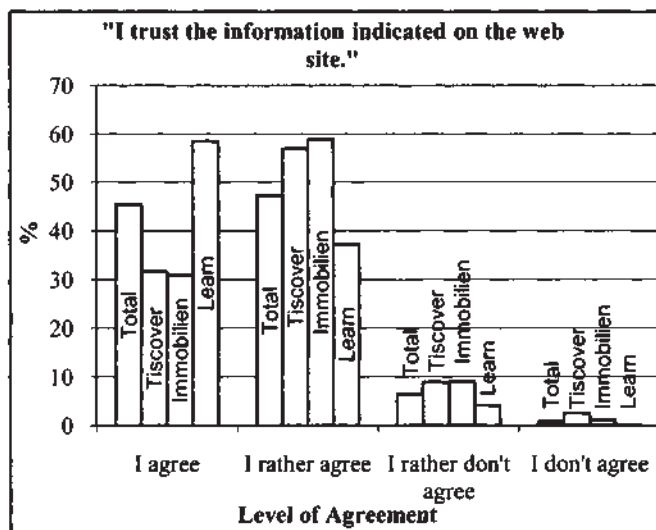
Figure 21. Trust towards the Information

The worst average results as well as web site specific results were received for the question about security standards presented in Table 26.

Table 26. Perceived Security Standards

"The web site seems like being equipped with the best security standards."				
Level of agreement	**Personalised Internet Application**			
	Total	**Tiscover**	**Immobilien**	**Learn**
I agree	22.7%	16.9%	19.4%	26.4%
I rather agree	59.8%	63.3%	61.2%	57.9%
I rather don't agree	15.1%	14.3%	16.5%	14.4%
I don't agree	2.5%	5.5%	2.8%	1.2%

If the question is formulated a bit less rigorous or detailed with "I have the impression that the web site www.immobilien.net / https://learn.wu-wien.ac.at / www.tiscover.at is secure." the results are slightly better. Only 9% of the respondents disagreed (or rather disagreed) on average (13% for Tiscover, 10% for Immobilien and 8% for Learn@WU). If the test persons were asked about their impression that personal information is treated confidentially at the respective web sites, the majority answered the question positively. However, 15% of the total sample did not have the impression of the confident treatment of personal information. The disagreement was highest for Tiscover with 18% followed by Learn with 14% and Immobilien.net with 13% of the respondents answering negatively.

The last and very interesting question was concerned with the trustworthiness of the proposals and searching results given by the system. The best result was reached by Immobilien.net with 94% agreeing (compared to 87% of Tiscover and 84% of Learn).

The following section is taking a close look on the dependent and endogenous variables of the study. First, satisfaction is analysed and compared across the web sites. Second, the results for commitment (if the web site will be recommended to others and if it will be used again) are outlined.

5.1.3.6 Satisfaction

The construct of satisfaction was measured with five items covering different facets of satisfaction like expectations or experiences with the web sites (see Table 27). A 4-point Likert scale from I agree to I don't agree like for the previous questions was applied. Furthermore, there was one question serving as an overall measurement item asking about general satisfaction with the web site. For this question the answering possibilities were "I am very satisfied", "I am rather satisfied", "I am rather not satisfied" and "I am not satisfied at all".

Table 27. Items for the Construct "Satisfaction"

"Satisfaction"
• I am satisfied with the outcome of my information search.
• Overall, I made some positive experiences with the use of Learn @WU / www.immobilien.net / www.tiscover.at.
• The quality of the proposals / searching results was convincing.
• This web site meets my expectations.
• Overall, how is your impression of this web site? (global satisfaction item)

First, the global satisfaction will be analysed to gain insight how the satisfaction with the web sites was rated overall by respondents. Figure 22 outlines that the satisfaction level for all three of the systems is generally quite good with an agreement level of at least 87%. The total average satisfaction is with 94% of the respondents very high and the majority is even very satisfied (44% being rather satisfied).

Best results were achieved with the question about experiences with the web site being almost 90% overall as well as if the web sites are analysed individually (Table 28). Learn@WU got the best ratings with only 3% of the respondents indicating that they rather did not have a good experience with the web site.
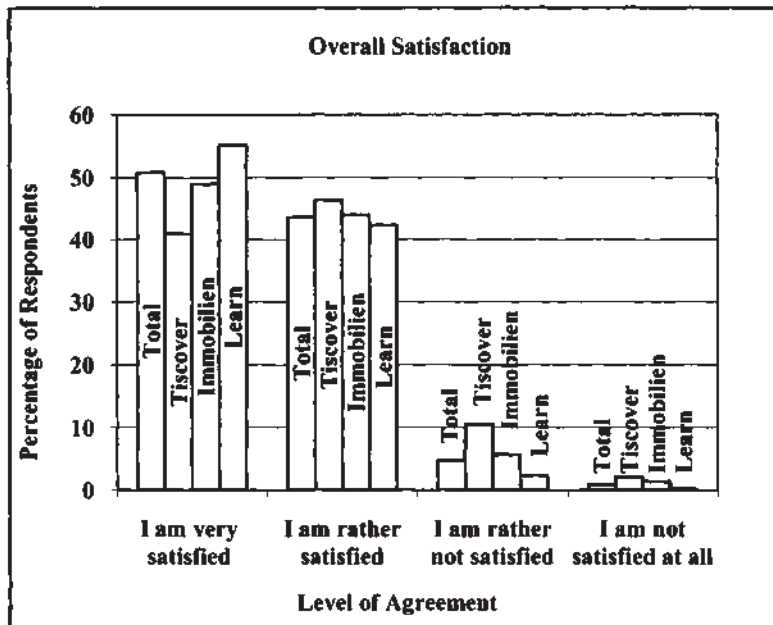
Figure 22. Overall, how is your Impression of this Web Site?

Worst ratings were given to the question about the satisfaction with proposals and searching results. Overall, 81% of the test persons were satisfied (23%) or rather satisfied (58%). Immobilien.net achieved best ratings with 84% being satisfied. However, when looking at the percentages of dissatisfaction it is Learn which got the best results for the answering category of "I am not satisfied at all" with only 0.8% agreeing (compared to 3.3% of Immobilien and 6.3% of Tiscover).

As far as the results for the question "This web site meets my expectations." are regarded rather different ratings arose. The overall agreement was 88%, for Learn@WU it was even 92%. Immobilen.net achieved 88% of agreement among the respondents. In the case of Tiscover, 78% of the study participants' expectations were met.

Finally, what about the outcome of the information search? The best results were obtained for the online learning platform with 42% of the respondents being satisfied with the outcome and 51% being rather satisfied. For

Immobilien.net the percentage of respondents indicating that they were rather satisfied was the same (with 51%). However, the number of test persons who have been very satisfied was lower with 32%. Tiscover got 35% of respondents agreeing to that question and 47% rather agreeing. The final construct described will be commitment which is hypothesised to be determined by satisfaction.

Table 28. Positive Experience with the Web Site

Level of agreement	Personalised Internet Application			
	Total	Tiscover	Immobilien	Learn
I agree	54.5%	33.8%	40.7%	69.3%
I rather agree	38.9%	53.6%	50.4%	27.4%
I rather don't agree	5.6%	9.3%	7.6%	3.2%
I don't agree	1.1%	3.4%	1.4%	0.1%

5.1.3.7 Commitment

Commitment is measured in this study by the intention to revisit the web site as well as whether the respondents plan to recommend the web site to others.

Table 29. Items for the Construct "Commitment"

"Commitment"
• I can recommend this web site.
• I will revisit this web site.
• I will use this web site more often in the future.

The respondents answered most positive to the question about their intention to revisit the web site compared to the other commitment questions. More than 85% of the respondents have the intention to revisit the web site (overall as well as for the respective web sites). However, this has to be put into perspective because among the test persons may be regular users in the case of Tiscover and Immobilien.net and there are certainly regular users of Learn@WU among the respondents. Table 30 shows the detailed answers for this question.

Table 30. Intention to Revisit the Web Site

Level of agreement	Personalised Internet Application			
	Total	Tiscover	Immobilien	Learn
I agree	70.6%	45.1%	63.1%	83.4%
I rather agree	24.6%	41.4%	29.8%	16.1%
I rather don't agree	3.2%	9.3%	4.7%	0.4%
I don't agree	1.5%	4.2%	2.4%	0.1%

When looking at the results for the question about the intention of the respondents to use the web site more often in the future, results got worse. Overall, 83% of the test persons agree or rather agree (72% in the case of Tiscover, 80% for Immobilien.net and 88% for Learn@WU).

The most interesting commitment question was probably if the web site is intended to be recommended to others. Obviously a web site is only recommended if oneself is satisfied with it and if it is found to be useful or enjoyable or fulfils some kind of desired function. Only 2% of the Learn@WU study participants indicated that they would rather not recommend it, for Immobilien the percentage disagreeing with the statement "I would recommend this web site." was 6%, in case of Tiscover 15% disagreed.

The intention of this section was to give an overview of how the respective constructs and questions were answered. The next section concentrates on the analysis of effects of the independent constructs (Usefulness, Ease of Use,

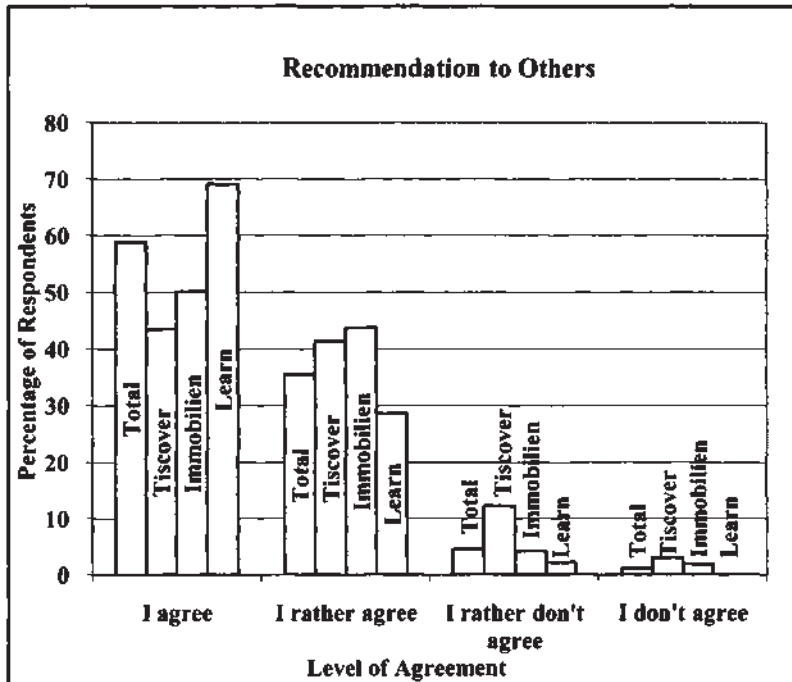Exploratory Browsing Behaviour and Trust) on the dependent variables satisfaction and commitment.

Figure 23. Do you Intend to Recommend the Web Site?

5.2 Testing the Structural Model of Satisfaction with Personalised Internet Applications

The basic goal of this dissertation is to identify relationships between the constructs outlined in previous sections. Structural Equation Modelling (SEM) can handle and explain relationships between latent (unobserved) and manifest (observed) constructs. The modelling technique is a confirmatory rather than an exploratory method. SEM is able to identify causal influences of the exogenous (independent) on the endogenous (dependent) variables. This is similar to regression analysis but has the additional capability to identify the influences of endogenous variables upon one another (Anderson & Gerbing, 1988; Hair,

Anderson, Tatham, & Black, 1998). This study deals with latent constructs (e.g. attitude towards information search via the WWW, trust towards the web site and the processing of information, overall satisfaction with the web site) and proposes hypotheses and relationships between the constructs (outlined in Chapter 3). Therefore, SEM was identified to be the most appropriate analyzing technique. The software program to identify relationships relevant to this study is AMOS. AMOS is an additional module of SPSS, the latest version is 5.0.

Structural equation modelling has a lot of interesting facets and there would be numerous issues to report on. However, only the most important ones (model fit indicators, differentiation between measurement and structural model) and currently discussed topics like formative versus reflective indicators are further outlined in this study. Therefore, this section covers the following topics:

- ❖ Formative versus reflective indicators in SEM
- ❖ Differentiation between measurement and structural Model
- ❖ Model evaluation of SEM and fit indicators
- ❖ Results of SEM for this study
- ❖ Results of SEM for each of the personalised internet applications by multiple group analysis

5.2.1 Formative versus Reflective Indicators

One crucial distinction which is discussed recently more and more in methodological papers about SEM are formative versus reflective indicators. Are some reflective indicators sometimes used by researchers as if they were formative? Is the difference between the two known enough? Figure 24 and Figure 25 aim to illustrate the difference between the approaches. In a formative measurement model the items are influencing or forming the latent variable. Formative indicators are also known as "cause indicators" (Eggert & Fassott, 2003). They can be seen as exhaustive and an example is the socio-economic status. Indicators like education and income are influencing or causing the latent variable (Chin, 1998). The coefficient "y" represents the weight of the respective indicator to the latent variable. The correlations "r" are illustrated by the two headed arrows.
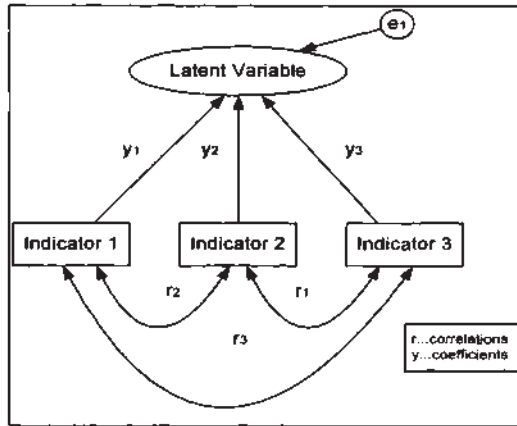
Figure 24. Formative Indicators

The opposite is the case for a reflective measurement model: the latent variable is affecting the respective items (Eggert & Fassott, 2003). The items or indicators (effect indicators) are just an example of how to express the latent construct and could be replaced by other indicators. A change in the latent variable would result in a change of all of the indicators (Backhaus, Erichson, Plinke, & Weiber, 2003). The indicators are an error-prone measurement of the construct. Therefore, the error terms are included in the model for each indicator (Eggert & Fassott, 2003). Thus, they are not exhaustive like formative measures.

The controversial issue is that reflective indicators are often treated like formative ones which causes difficulties like a misleading measurement model and different results (Chin, 1998, Albers and Hildebrandt, 2006, Eggert and Fassott 2003). While formative measurement models were rather neglected in the past they receive more attention now and the development and validation of formative models is increasingly proposed (Diamantopoulos & Winklhofer, 2001). In this study the indicators are reflective measures, they are just an example of how to assess e.g. trust or ease of use. The indicators used could be replaced by others and are not exhaustive. If the latent variable changes the indicators change as well.
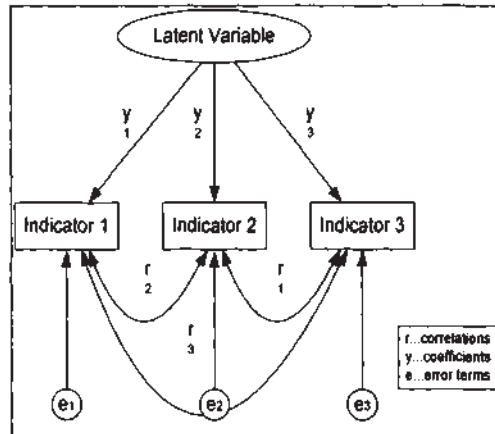
Figure 25. Reflective Indicators

5.2.2   Measurement and Structural Model

The distinction between the measurement and the structural model is another crucial issue when working with SEM. The measurement model describes the relationships between the latent constructs and the indicators. The structural model is concerned with the relations of independent and dependent variables. Figure 26 illustrates these two components, the measurement model being further differentiated between the endogenous (dependent) and the exogenous (independent) constructs. Two different approaches to deal with structural equation modelling are proposed by literature. The first method is to conduct the test of the measurement and structural model simultaneously (Mazanec, 1982). The argument in favour of this approach is that otherwise simple factor analysis and regression analysis could be done. The second approach is relying on a two step procedure. First, the pure measurement model is tested and its model fit is evaluated. Only if fit indices are acceptable the researcher should proceed to test the structural model (Anderson & Gerbing, 1988; Kline, 1998). Both approaches are followed in this study. In fact, the structural equation modelling program AMOS is estimating both models simultaneously. However, the measurement model will be estimated first separately too to gain details about validity and reliability. Next, an overview about different fit indices used in structural equation modelling will be given.
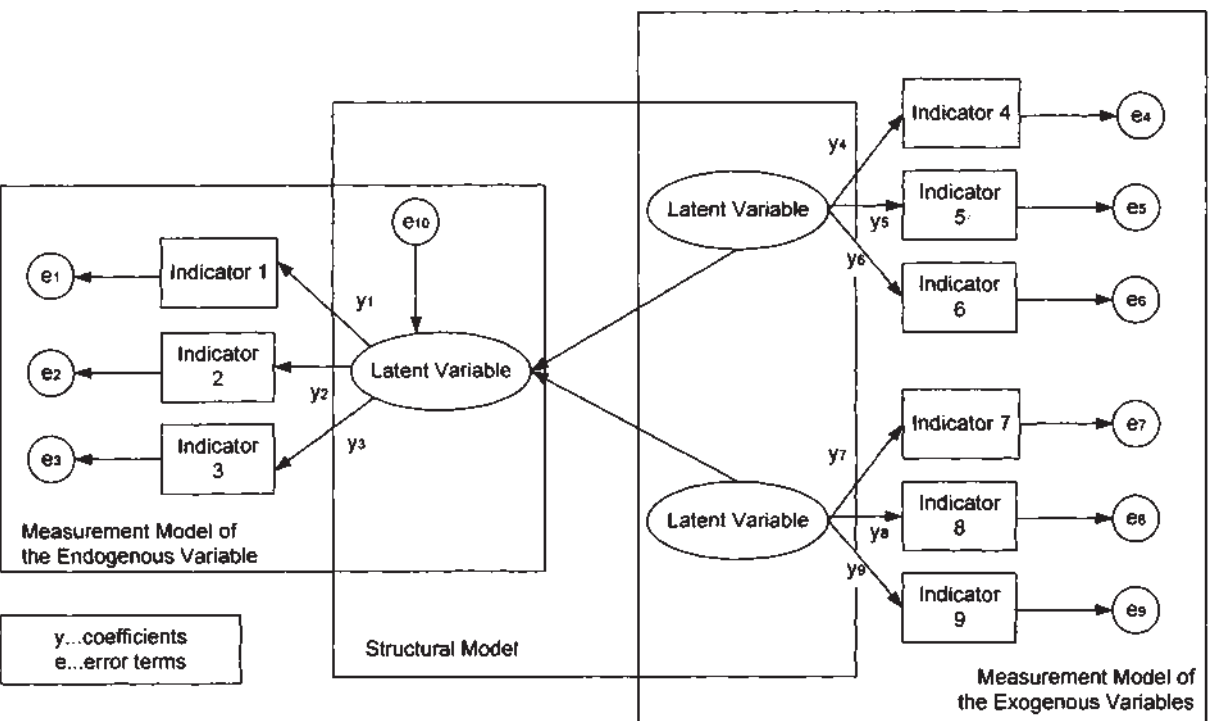
Figure 26. Structural Equation Model (adapted from Backhaus 2003)

Measurement Model of
the Endogenous Variable

Structural Model

Measurement Model of
the Exogenous Variables

y...coefficients
e...error terms

5.2.3   Model Evaluation in SEM

Model fits or so called (goodness of) fit indices are reported to evaluate a model. Some rules of thumb found in the literature serve as recommendations. First, the operationalisation is assessed based on the constructs (local measures). For the entire measurement model, the so-called global measures are used for evaluation (Zinnbauer & Eberl, 2004). Finally, the assessment of the structural model is based upon global measures as well.

Fit Measures	
Global Criteria	**Local Criteria**
• Absolute Fit Measures • Incremental Fit Measures • Parsimonious Fit Measures	• Construct Reliability • Convergent Validity • Discriminant Validity

Figure 27. Overview of Categories of Fit Measures
(adapted from Zinnbauer and Eberl, 2004)

5.2.3.1   Local Criteria

Local criteria are applied to the measurement model, the operationalisation and the constructs. Fornell and Larcker (1981) proposed that convergent validity, discriminant validity, construct reliability and objectivity should be taken into account. First, some definition of validity and reliability will be given. Reliability is the degree to which the measurement of a variable is burdened with error. However, a variable can never be perfectly measured and a certain measurement error always remains (Backhaus, Erichson, Plinke, & Weiber, 1994; Duncan, 1975; Hair et al., 1998). Are the construct's indicators accurately measuring what they are supposed to measure is a brief explanation of validity (Bollen, 1989; Hair et al., 1998). Although, validity and reliability are interrelated they have to

be differentiated: reliability does not imply validity and vice versa (Hair et al., 1998).

Construct reliability, also called composite reliability, is computed with standardised loadings and the measurement error according to the following formula (Hair et al., 1998):

$$\text{Construct Reliability} = \frac{\left(\sum \text{stand. loading}\right)^2}{\left(\sum \text{stand. loading}\right)^2 + \sum \varepsilon_j}$$

As a rule of thumb, construct reliability should be above 0.6 (Bagozzi & Yi, 1988) or even above 0.7 (Hair et al., 1998).

Convergent validity describes the amount of variance covered by the construct compared to the amount of variance which can be allocated to measurement error (Fornell & Larcker, 1981). Convergent validity is assessed with Average Variance Extracted (AVE) or Variance Extracted Measure. It is calculated the way construct reliability is computed except that standardised loadings are squared before they are summed up (Fornell & Larcker, 1981; Hair et al., 1998). The AVE should be greater than 0.5 so that the variance due to measurement error is not higher than the variance captured by the construct (Fornell & Larcker, 1981).

Finally, discriminant validity is the extent to which one construct is differentiating from other concepts for which no theoretical relationship is given (Diamantopoulos & Schlegelmilch, 1997). It can be assessed by comparing AVE and the shared variance between the construct and all other variables in the model. AVE should exceed this difference to meet the requirements of discriminant validity (Fornell & Larcker, 1981).

5.2.3.2   Global Criteria

Global fit measures can be divided into three groups: absolute, incremental (or relative or comparative) and parsimony oriented fit measures. Absolute fit measures evaluate to which degree the structural or measurement model is predicting the observed covariance matrix, what is the degree of explained variance? Incremental/relative/comparative fit measures compare the proposed model to alternative models. How much differs the research (or target) model

from the null (or independence, baseline) model? The null model hypothesises that there are no relationships. Parsimony oriented fit measures are penalising too much complexity in the model (Bollen, 1989; Hair et al., 1998; Norman & Streiner, 2003). Table 31 gives an overview of some recommended fit indices and their rules of thumb.

Table 31. Recommended Model Fits in SEM

Absolute Fit Measures	Definition	Acceptable Level	References
X^2/df	Ratio between chi-square and degrees of freedom	≤ 5 ≤ 3	(Kline, 1998; Schermelleh-Engel, Moosbrugger, & Müller, 2003)
GFI	Goodness of Fit Index, how well are sample data reproduced, an index for the amount of explained variance and covariance	≥ 0.9	(Baumgartner & Homburg, 1996; Byrne, 2001; Schermelleh-Engel et al., 2003)
RMSEA	Root Mean Square Error of Approximation, Computes average lack of fit per degree of freedom	≤ 0.05 ≤ 0.08	(Hair et al., 1998; Schermelleh-Engel et al., 2003)
RMR	Root Mean Square Residual, Mean residuals between the observed and predicted covariance	close to 0 => better fit< 0.1	(Bollen, 1989; Marsh, Balla, & McDonald, 1988)

Incremental Fit Measures	Definition	Acceptable Level	Authors
CFI	Comparative Fit Index Fit of the model relative to the null model	> 0.95 close to 1	(Hu & Bentler, 1999; Schermelleh-Engel et al., 2003)
TLI	Tucker Lewis Index Compares models, adjusts for complexity	> 0.9 > 0.95	(Hair et al., 1998; Hu & Bentler, 1999)
NFI	Normed Fit Index Compares chi-squares of the model to the null model	> 0.9	(Backhaus et al., 2003; Norman & Streiner, 2003; Schermelleh-Engel et al., 2003)
Parsimonious Fit Measures	Definition	Acceptable Level	Authors
AGFI	Adjusted Goodness of Fit Index Variant of GFI, adjusted for degrees of freedom	> 0.9 > 0.85	(Norman & Streiner, 2003) (Schermelleh-Engel et al., 2003)
PGFI	Parsimonious Goodness of Fit, Variant of GFI, based on the parsimony of the estimated model	close to 0 => better fit	(Hair et al., 1998)
AIC	Akaike Information Criterion, Adjustment of x^2 for the number of estimated parameters, used to compare models	close to 0 => better fit smaller than AIC for comparison model	(Hair et al., 1998; Schermelleh-Engel et al., 2003)

The recommendations in literature suggest that the Chi-square statistic should never be used isolated because it is sensitive to sample size (Baumgartner & Homburg, 1996; Schermelleh-Engel et al., 2003). Furthermore, complex models are usually favoured by a better chi-square statistic. The second absolute fit measures GFI is again accused to be sensitive to sample size (Marsh et al., 1988). For some indexes more than one acceptable level is indicated and it can be said that in general there is no agreement upon acceptable levels in the research community (e.g. Baumgartner and Homburg, 1996, Schermelleh-Engel, et al., 2003). These rules of thumb should not be taken to rigorous because they are considered quite arbitrary and differ from author to author (Schermelleh-Engel et al., 2003).

5.2.4 Results of Testing the Structural Hypotheses

First, an overview of the fit criteria for the measurement model is given and the measurement model and its constructs and indicators are presented. Then, the focus is on the structural model and its fit indicators.

5.2.4.1 Measurement Model

First, a confirmatory factor analysis (CFA) was undertaken to purify the scale. Finally, 21 of the original 33 items remained for the analysis (enjoyment is not further mentioned because it was not used in the final model and served just as a competing dimension to exploratory browsing behaviour).

Table 32 outlines which of the items were used in the questionnaire and finally in the measurement model. Their abbreviations are indicated as well.

Table 32. Final Scales

Dimen-sion	Exploratory behaviour – Operationalisation	Used in the final measure-ment model	Abbre-viation
Ease of Use	Overall, I find this web site easy to use.	X	EOU1

Dimen-sion	Exploratory behaviour – Operationalisation	Used in the final measure-ment model	Abbre-viation
	This web site is user friendly.	X	EOU2
	It is easy to learn how to use this web site.	X	EOU3
	The structure of the web site is confusing.		EOU4
Usefulness	Overall, I find this web site being useful.	X	U1
Usefulness	The use of Learn@WU / immobilien.net / Tiscover did facilitate my search for learning materials / real estate / a travel.	X	U2
Usefulness	This web site enables me to quickly find interesting information.		U3
Usefulness	This web site is increasing the quality of my information search.	X	U4
Exploratory Browsing Behaviour	The visit of the web site offered me variety.		EBB1
Exploratory Browsing Behaviour	This web site inspired me.		EBB2
Exploratory Browsing Behaviour	This web site excited my curiosity.	X	EBB3
Exploratory Browsing Behaviour	The use of the web site was exciting to me.	X	EBB4
Exploratory Browsing Behaviour	The web site offered novel information / products to me.		EBB5

Dimen-sion	Exploratory behaviour – Operationalisation	Used in the final measure-ment model	Abbre-viation
	Using the web site was a pleasure.	X	EBB6
Trust	This web site conveys the feeling that personal information is treated confidentially.	X	T1
	I trust the information indicated on the web site.		T2
	I have the impression that the web site www.immobilien.net / https://learn.wu-wien.ac.at / www.tiscover.at is secure.	X	T3
	The web site seems like being equipped with the best security standards.	X	T4
	The proposals (searching results) of the web site were convincing.		T5
Attitude	Information acquisition through the web is too time-consuming.	X	A1
	Information acquisition via the web is useful.		A2
	I think it was a good idea to use the web for that type of task.	X	A3
Experience / Internet Familiarity	I feel familiar with the web site because of previous usage.	X	EXP1
	How often do you use the WWW on average?	X	EXP2

Dimen-sion	Exploratory behaviour – Operationalisation	Used in the final measure-ment model	Abbre-viation
	Do you consider yourself as an experienced user of the WWW?		EXP3
Satisfaction	I am satisfied with the outcome of my information search.		SAT1
	Overall, I made some positive experiences with the use of Learn @WU / www.immobilien.net / www.tiscover.at.	X	SAT2
	The quality of the proposals / searching results was convincing.		SAT3
	This web site meets my expectations.	X	SAT4
	Overall, how is your impression of this web site? (global satisfaction item)	X	SAT5
Commitment	I can recommend this web site.	X	COMMIT 1
	I will revisit this web site.	X	COMMIT 2
	I will use this web site more often in the future.		COMMIT 3

The measurement model for the independent constructs is outlined in Figure 28. For each of the latent variables one reference (or indicator) variable is selected were the regression weight is constrained to 1.0. This is done to allow the remaining paths to be estimated. The reference variable which should be

chosen to assign the regression weight 1.0 is typically the variable having the highest factor loading on a latent variable. The following measurement model for the independent constructs is only valid for the final structural model. The measurement models for the alternative models will not be further outlined since they are finally not used.
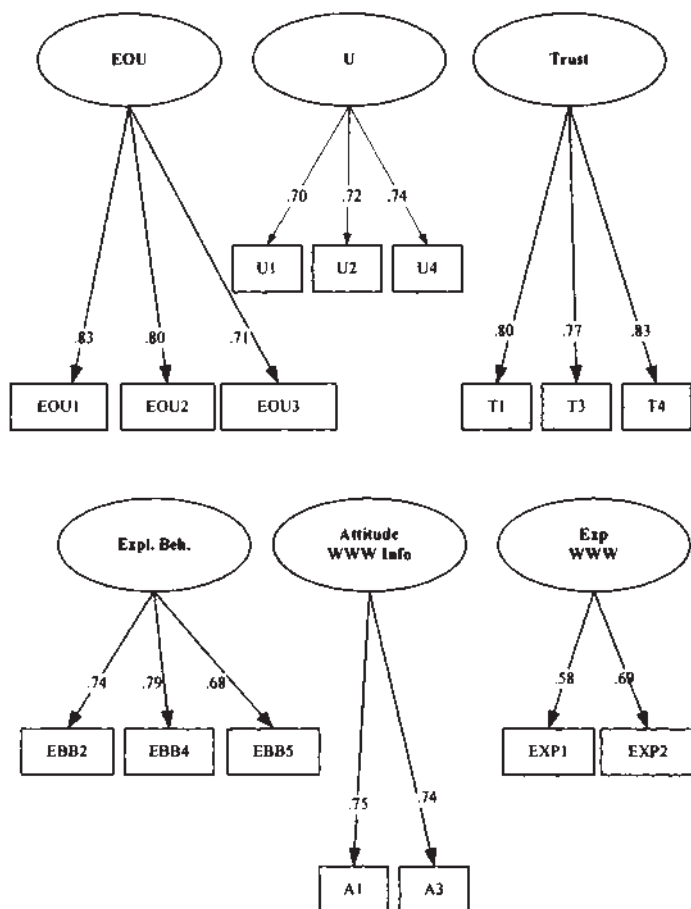

Figure 28. Measurement Model for the Independent Variables

In Figure 29 the measurement model for the dependent variables, satisfaction and commitment is presented with their respective factor loadings.
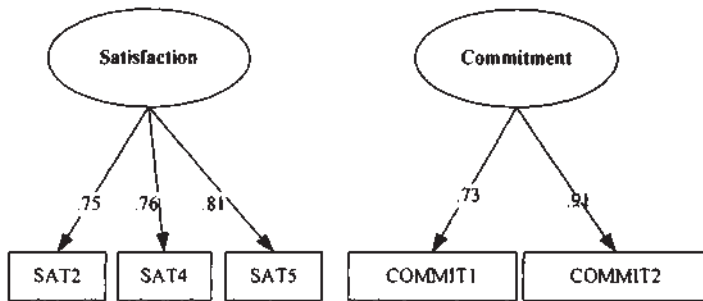
Figure 29. Measurement Model for the Dependent Variables

Next, the local criteria for these items are further outlined and evaluated according to the criteria of reliability and validity.

❖ **Local Criteria**

First, the operationalisation will be evaluated on a local basis. Factor loadings were already presented in Figure 28 and Figure 29. Next construct reliability, convergent validity (AVE - average variance extracted) and discriminant validity are examined for statistical significance.

Construct Reliability

When looking at construct or composite reliability (see Table 33), all of the constructs met the recommended level of having a reliability above 0.6. Experience is the only negative exception. However, the difference is not a lot below the recommended level missing just 0.02 to achieve 0.6.

All of the variables are related to their constructs at a 0.01 significance level. Furthermore, the indicator reliability can be used as an additional criterion which is recommended to be above 0.4 (Homburg & Baumgartner, 1995). Indicator reliability is the part of the variance of the variable which is explained by the measured variables. This criterion is fulfilled for all of the indicators except one indicator of experience (see Table 33).

Convergent Validity

Average Variance Extracted (AVE) serves as a measure of convergent validity and the recommendation is that it should be above 0.50 so that the variance due to the construct is greater than the variance due to measurement error. For all of the constructs this criterion is fulfilled, except once again for experience.

**Table 33. Reliability and Validity
of the Constructs**

Constructs & Items	Construct Reliability	Indicator Reliability	AVE
Attitude	0.72		0.56
ATT1		0.57	
ATT2		0.55	
Experience	0.58		0.41
EXP1		0.34	
EXP2		0.48	
Exploratory Browsing	0.67		0.55
EXPL1		0.63	
EXPL2		0.46	
EXPL3		0.55	
Trust	0.84		0.64
TRUST1		0.63	
TRUST2		0.69	
TRUST3		0.60	
Usefulness	0.76		0.52
USEFUL1		0.49	
USEFUL2		0.51	
USEFUL3		0.54	
Ease of Use	0.83		0.61

Constructs & Items	Construct Reliability	Indicator Reliability	AVE
EASE1		0.69	
EASE2		0.65	
EASE3		0.51	
Satisfaction	0.82		0.59
SAT2		0.56	
SAT4		0.58	
SAT5		0.66	
Commitment	0.81		0.68
COMMIT1		0.53	
COMMIT2		0.83	

(AVE: Average Variance Extracted)

Obviously, the construct of experience is not performing well when considering construct reliability and average variance extracted. However, when eliminating experience from the measurement model, the global fit criteria (particularly x^2 / df and RMSEA) are significantly getting worse compared to the model proposed in Figure 28. Therefore, it is decided to keep experience in the research model.

Discriminant Validity

Finally, the Fornell and Larcker (1981) approach is applied to assess discriminant validity. AVE should exceed shared variance between the construct and all other constructs which is fulfilled by all of the constructs (except for the shared variance between satisfaction and commitment). Table 34 indicates shared variances which can be compared to AVE in Table 33.

Table 34. Shared Variance to Assess Discriminant Validity

Constructs			Shared Variance
Ease of Use	⇔	Experience	0.00
Ease of Use	⇔	Usefulness	0.51
Ease of Use	⇔	Trust	0.18
Ease of Use	⇔	Attitude	0.05
Ease of Use	⇔	Expl. Browsing	0.16
Usefulness	⇔	Experience	0.02
Usefulness	⇔	Trust	0.24
Usefulness	⇔	Expl. Browsing	0.26
Usefulness	⇔	Attitude	0.20
Trust	⇔	Experience	0.01
Trust	⇔	Expl. Browsing	0.24
Trust	⇔	Attitude	0.04
Expl. Browsing	⇔	Attitude	0.04
Expl. Browsing	⇔	Experience	0.01
Experience	⇔	Attitude	0.26
Satisfaction	⇔	Commitment	0.87

❖ **Global Criteria**

Table 35 indicates the global fit indices for the measurement model. Not all of the fit indices described above are further outlined because they are redundant and it is not recommended to indicate all of them. When compared to recommended acceptable fit indices as outlined above, all of the indices fulfil these criteria except x^2 / df which is too high depending on the acceptable level one is trusting. However, since the other criteria performed well, the level of x^2 / df is accepted.

Now that global and local fit measures were tested and were found to be acceptable, the structural model will be examined with the goal to confirm or reject the hypothesised relationships.

Table 35. Fit Indices for the Measurement Model

Fit Index	Level
x^2 / df	3.686
GFI	0.969
RMSEA	0.044
NFI	0.959
CFI	0.970
AGFI	0.953

Structural Model

❖ Final Model

First, the final structural model is presented, followed by the fit indices and the outline of the hypotheses being confirmed or rejected. Furthermore, alternative models are tested and separate structural models for each of the personalised internet applications are outlined. All of the path estimates indicated in Figure 30 are significant at a level of 0.001. The insignificant relationships are suppressed in the figure but are outlined in the description below.

The highest influence on satisfaction with the personalised internet applications is attributed to usefulness with a path estimate of 0.56. Therefore, the hypotheses (H1a and H1b) outlined in chapter 3.2 about the direct and indirect influencing factors on satisfaction can be confirmed in the case of usefulness. Usefulness has a strong direct influence (path estimate = 0.56) on satisfaction with the personalised internet application and exerts a strong indirect influence (path estimate = 0.58) via Exploratory Browsing Behaviour. Ease of

Use (EOU) positively affects satisfaction directly (path estimate = 0.19, hypothesis 2a confirmed) as well as indirectly through Usefulness (path estimate = 0.63, hypothesis 2c confirmed) and Trust (path estimate = 0.44, hypothesis 2b confirmed). The only hypothesis relating to trust was that the construct exerts a positive direct influence upon satisfaction. This hypothesis can be confirmed although the influence is not very high with a regression weight of 0.18. The final construct belonging to the category system characteristics is exploratory browsing behaviour which exerts a direct influence upon satisfaction with a regression weight of 0.20, thus confirming hypothesis 4.
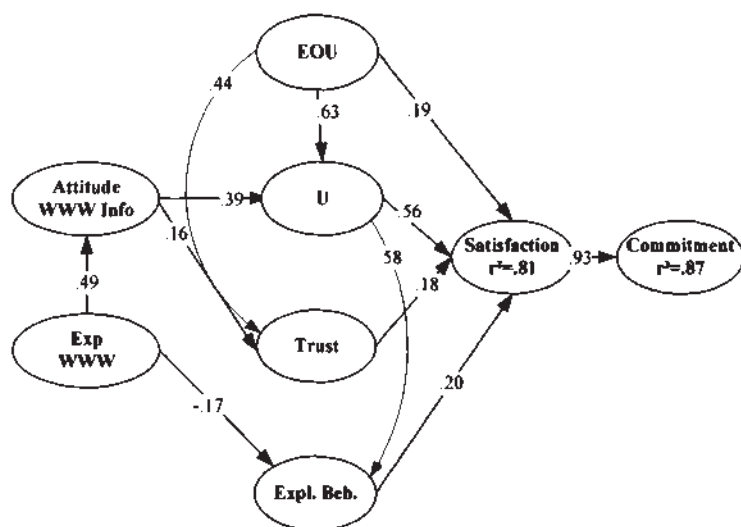
Figure 30. Overall Structural Model Explaining Satisfaction with Personalised Internet Applications

Finally, the hypotheses of the personal characteristics, attitude and internet familiarity are reviewed. Attitude toward information search via the WWW was hypothesised to have a direct influence on satisfaction. This hypothesis (H5a) has to be rejected because the regression weight which is nearly not existent with a path estimate of 0.01 is non-significant (p = 0.754). Hypothesis 5b suggests that attitude affects the level of trust which can be confirmed (path estimate = 0.16). The next hypothesised relationship between attitude and exploratory browsing behaviour has to be rejected (path estimate = 0.04, p = 0.291). Furthermore,

attitude has an influence upon usefulness which is quite strong with a regression weight of 0.39 (confirming hypothesis 5d).

Internet familiarity or experience was hypothesised to have several effects: a direct influence on satisfaction and indirect effects via trust, exploratory browsing behaviour, attitude and EOU. The direct influence (hypothesis 6a) on satisfaction is rejected. The regression weight is -0.01 at a p-level of 0.578. Does experience exert an influence on EOU (H6b)? The regression weight is very low with 0.08 and the p level only significant at 0.03. Therefore, this low influence is not further considered in the structural model. Trust is not affected by experience (path estimate = -0.08 and p = 0.196, H6c rejected). Finally, Internet familiarity affects exploratory browsing behaviour negatively (H6d, path estimate = -0.17) and attitude positively (H6e, path estimate = 0.49).

When looking at the fit indices for the structural model, results suggest an excellent fit for incremental fit measures CFI (comparative fit index) and NFI (normed fit index) with both being above 0.95. The same is true for the parsimonious fit measure AGFI (adjusted goodness of fit index) which is highly above the recommended level of 0.9. Finally, the absolute fit measures GFI and RMSEA fulfil the recommended levels of GFI being above 0.9 and RMSEA being below 0.05. Only the ratio of Chi-square to the degrees of freedom is above 3 but below 5.

Table 36. Fit Indices for the Structural Model

Fit Index	Level
X^2 / df	3.716
GFI	0.956
RMSEA	0.044
NFI	0.951
CFI	0.963
AGFI	0.943

❖ Alternative Models

Furthermore, alternative models were tested in which enjoyment was used as a surrogate for exploratory browsing behaviour. Enjoyment is often proposed as an influencing factor for usage, satisfaction or acceptance (e.g. Igbaria et al., 1995, Teo, et al., 1999, Van der Heijden, 2003). Second, another alternative model was proposed by excluding personal factors from the model because the influence of experience and attitude towards online information search and e-services is expected to diminish more and more. A rising number of people are using the Internet on a regular basis and it is increasingly common to search, buy and book online. Furthermore, a lot of studies do not consider these influencing factors when assessing influences on satisfaction, usage or other outcome criteria (e.g. Kim and Stoel, 2004, Shih, 2004, Hsu and Chiu, 2003).
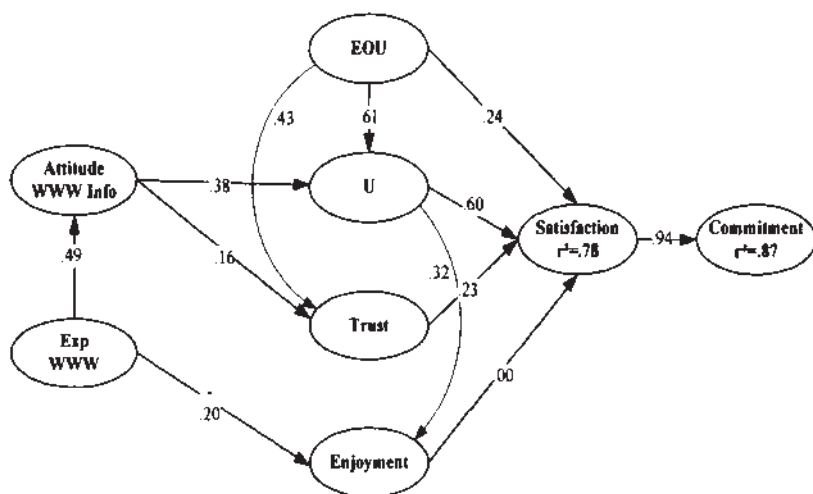
Figure 31. Alternative Structural Model with Enjoyment Instead of Exploratory Browsing Behaviour

Although the alternative model outlined in Figure 31 has quite similar influences compared to the one proposed in Figure 30, there is no influence of enjoyment on satisfaction (path insignificance at a level of $p = 0.910$). Furthermore, model fits are continuously more or less the same like for the final model ($x^2/df=3.545$, GFI=0.958, RMSEA=0.043, NFI=0.951, CFI=0.963, AGFI= 0.943). However, since enjoyment does not exert any influence on satisfaction,

the model (and the hypothesis 4a that enjoyment is exerting an influence upon satisfaction) is rejected in favour of the model indicated in Figure 30.

When looking at the second alternative (excluding personal characteristics), the following model presented in Figure 32 turns out. The path coefficients are again very similar to the final model. However, fit indices are worse than for the final model, especially the RMSEA and the ratio between chi-square and the degrees of freedom which is nearly reaching the level of 5 ($x^2/df=4.815$, GFI=0.955, RMSEA=0.052, NFI=0.956, CFI=0.965, AGFI=0.939). Furthermore, the final accepted structural model includes more information by considering the antecedents (i.e. experience and attitude) of the influencing factors. Therefore, the second alternative model is not accepted as the final structural model either.
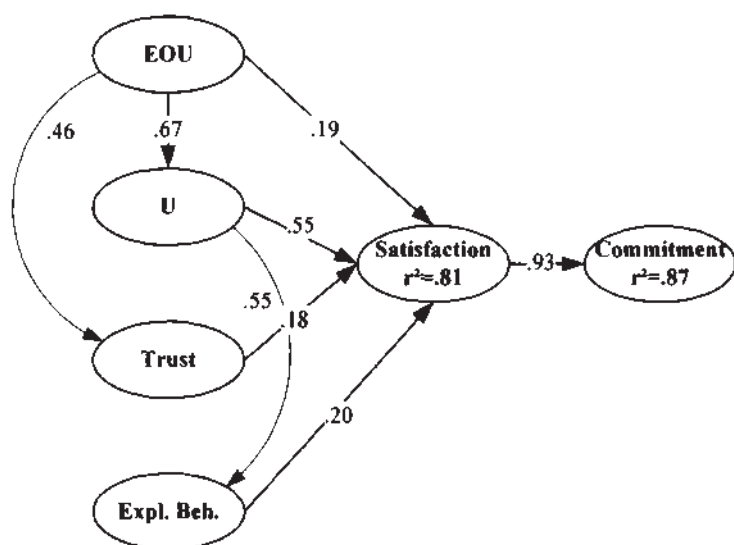
**Figure 32. Alternative Structural Model
without Personal Characteristics**

In conclusion, the research model proposed was confirmed; some of the hypothesised relationships had to be rejected. The construct of exploratory browsing behaviour has a significant impact on satisfaction whereas enjoyment did not have in this study. Personal characteristics proved to serve as antecedents

to some of the influencing factors and their inclusion in the model shows better fit indices than if they are excluded.

5.2.5 Structural Analyses for the three Personalised Internet Applications

Structural models for the respective personalised internet applications will be presented in the following sub-sections. Analyses of the three personalised internet applications were conducted with the goal to find out relevant differences in the path estimates. Such differences are likely because the web sites stem from different areas. Therefore, multiple group analysis was applied assuming that the structure of the model is the same across groups.

The focus will be on differences of path estimates only because the goal is to identify if there are differences in the influencing factors on satisfaction among the three personalised internet applications. Therefore, measurement variance will not be further outlined and factor loadings were held constant to test path estimates.

The non-invariance of the three models was tested by running a model were path estimates were first allowed to vary freely within groups. Afterwards parameter constraints were placed to be the same across groups allowing evaluating differences with the help of Chi-square difference and significance. Since experience and attitude towards online information search and e-service are neither questions targeted to the specific web site nor can they be influenced by the web site providers, they are not further considered in the multiple group analysis. Therefore, the alternative structural model outlined in Figure 32 will be used as the basis of the analyses.

When comparing the unconstrained to the constrained model a chi-square difference of 810.88 (degrees of freedom: 72) arose at a significance level of $p<0.001$, thus it is suggested that effects vary across groups. All of the estimates are significant at the level $p<0.05$. The following fit statistics are relevant to the multiple group analysis (for all of the three groups, including the constraints): $x^2 / df = 2.291$, RMSEA = 0.031, NFI = 0.931, CFI = 0.960, AIC = 1123.177. Table 37 illustrates the different path estimates for each of the personalised internet applications in the multiple group analyses.

**Table 37. Path Estimates for Multiple Group Analysis
(Unstandardised Estimates)**

Path			Path Estimates		
			Immobilien	Learn	Tiscover
EOU	→	U	0.69	0.46	0.75
U	→	EXPLBEH	0.86	0.77	0.72
EOU	→	TRUST	0.50	0.41	0.48
EOU	→	SAT	n.s.	0.23	0.22
U	→	SAT	0.50	0.44	0.35
TRUST	→	SAT	0.21	0.11	0.12
EXPLBEH	→	SAT	0.24	0.14	0.24
SAT	→	COMMIT	1.13	0.96	1.23
R^2 (satisfaction)			0.82	0.82	0.85
R^2 (commitment)			0.86	0.86	0.91

The Critical Ratios and significance levels are displayed in Table 38. The critical ratio is the regression weight estimate divided by the standard error estimate. A critical ratio above 1.96 indicates the rejection of the null hypothesis (that there is no relationship between the two latent variables). The significance level p is another decision criterion. All of the path estimates are significant at the level of $p<0.001$ except the path of ease of use going to satisfaction for the Immobilien.net model (and the path trust to satisfaction for Tiscover).

Table 38. Multiple Group Analysis: Critical Ratios and p-level
(EOU = Ease of Use, U = Usefulness. EXPLBEH = Exploratory Browsing Behaviour,
SAT = Satisfaction and C.R. = Critical Ratio)

Path			Immobilien	
			C.R.	p
EOU	→	U	14.594	< 0.001
U	→	EXPLBEH	12.090	< 0.001
EOU	→	TRUST	9.914	< 0.001
EOU	→	SAT	-0.241	0.809
U	→	SAT	5.863	< 0.001
TRUST	→	SAT	5.326	< 0.001
EXPLBEH	→	SAT	5.676	< 0.001
SAT	→	COMMIT	20.402	< 0.001
Path			Learn	
			C.R.	p
EOU	→	U	11.057	< 0.001
U	→	EXPLBEH	9.958	< 0.001
EOU	→	TRUST	7.985	< 0.001
EOU	→	SAT	6.120	< 0.001
U	→	SAT	7.831	< 0.001
TRUST	→	SAT	4.583	< 0.001
EXPLBEH	→	SAT	5.240	< 0.001
SAT	→	COMMIT	19.796	< 0.001
Path			Tiscover	
			C.R.	p
EOU	→	U	11.877	< 0.001
U	→	EXPLBEH	10.668	< 0.001
EOU	→	TRUST	7.779	< 0.001
EOU	→	SAT	3.815	< 0.001
U	→	SAT	5.284	< 0.001
TRUST	→	SAT	2.768	<0.01
EXPLBEH	→	SAT	4.947	< 0.001
SAT	→	COMMIT	20.244	< 0.001

Furthermore the chi-square differences between the respective groups and the constrained and unconstrained parameters were investigated and again, the significance level p is indicated. The results are illustrated in Table 39. In the first part of the table (italicised), differences between the constrained models and the unconstrained one are presented; the other three columns contain the pair wise comparisons.

Table 39. Multiple Group Analysis – Differences in Chi-Square and Significance Level

Path			Learn <=> Immobilien <=> Tiscover	
			Δx^2	p
EOU	$\rightarrow$	*U*	*73.493*	*<0.001*
U	$\rightarrow$	*EXPLBEH*	*54.161*	*<0.001*
EOU	$\rightarrow$	*TRUST*	*53.686*	*<0.001*
EOU	$\rightarrow$	*SAT*	*66.434*	*<0.001*
U	$\rightarrow$	*SAT*	*54.105*	*<0.001*
TRUST	$\rightarrow$	*SAT*	*55.834*	*<0.001*
EXPLBEH	$\rightarrow$	*SAT*	*57.612*	*<0.001*
SAT	$\rightarrow$	*COMMIT*	69.408	<0.001
Path			Learn <=> Immobilien	
			Δx^2	p
EOU	$\rightarrow$	U	46.675	0.001
U	$\rightarrow$	EXPLBEH	31.673	0.002
EOU	$\rightarrow$	TRUST	32.869	0.001
EOU	$\rightarrow$	SAT	44.490	<0.001
U	$\rightarrow$	SAT	31.572	0.002
TRUST	$\rightarrow$	SAT	34.801	0.001
EXPLBEH	$\rightarrow$	SAT	35.470	0.001
SAT	$\rightarrow$	COMMIT	36.990	<0.001
Path			Tiscover <=> Learn	
			Δx^2	p
EOU	$\rightarrow$	U	34.951	<0.001
U	$\rightarrow$	EXPLBEH	20.708	n.s.

Path			Tiscover <=> Learn	
			Δx^2	p
EOU	→	TRUST	21.262	0.047
EOU	→	SAT	20.486	n.s.
U	→	SAT	21.308	0.046
TRUST	→	SAT	20.475	n.s.
EXPLBEH	→	SAT	23.259	0.026
SAT	→	COMMIT	34.236	0.001
Path			Tiscover <=> Immobilien	
			Δx^2	p
EOU	→	U	24.220	0.019
U	→	EXPLBEH	25.737	0.012
EOU	→	TRUST	23.801	0.022
EOU	→	SAT	32.550	0.001
U	→	SAT	25.819	0.011
TRUST	→	SAT	25.645	0.012
EXPLBEH	→	SAT	23.732	0.022
SAT	→	COMMIT	25.572	0.012

If all of the three groups are compared the results indicate that there are differences for all of the paths. However, if differences or similarities among groups are regarded in greater detail a few non-significant paths arise. If the groups are compared pair wise, no significant differences between the groups Tiscover and Learn for the path exploratory behaviour and usefulness, ease of use and satisfaction and finally, trust and satisfaction were found.

Although not all of the path differences of the pair wise comparisons are significant, the models resulting from multiple group analyses will be outlined in the following sub-sections to be able to capture differences. Furthermore, possible reasons for differences are given. The following figures contain unstandardised estimates because they are preferably used when comparing paths among groups because obviously variances could be different (Garson, 2006).

❖ **Structural Model for Tiscover**

Surprisingly, for Tiscover usefulness seems to play a less important role than for the other two personalised internet applications although it remains the path estimate being highest compared to the other direct influencing factors on satisfaction. The relationship between ease of use and usefulness is highest for Tiscover. Obviously, the more user-friendly the web site is perceived the higher is the perceived usefulness. The results of the pair wise comparisons of path estimates indicated in Table 39 are reflected by the structural model of Figure 33.
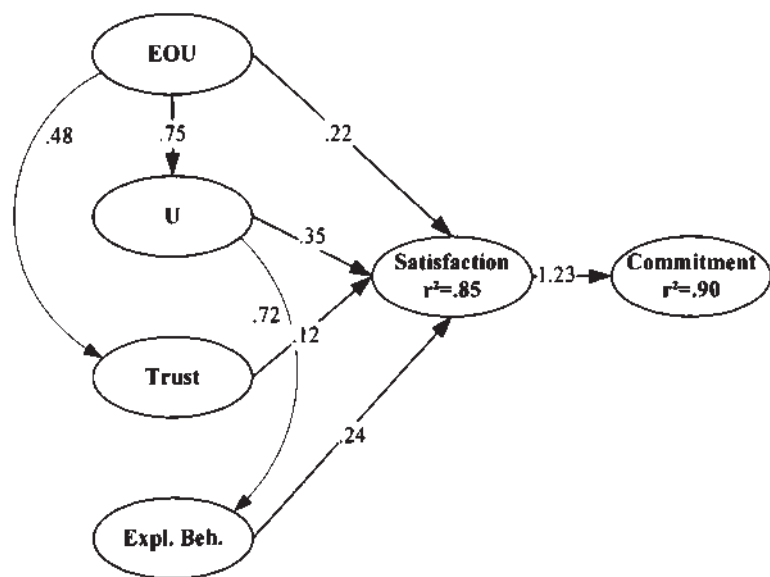
Figure 33. Partial Structural Model for Tiscover
(unstandardised estimates)

The regression weights between ease of use and satisfaction is for Tiscover 0.22 and for Learn 0.23. The difference was identified as being non-significant (Table 39). The same is true for the path trust and satisfaction. The influence of trust on satisfaction is neither high for Tiscover (path estimate = 0.12) nor high for Learn@WU (path estimate = 0.11). Finally, the influence of usefulness on exploratory behaviour is high for both, Tiscover (path estimate = 0.72) and

Learn@WU (path estimate = 0.77). Again, there were no significant path differences found in the chi-square test when comparing these two personalised internet applications pair wise. Finally, the strongest model explanation is found for Tiscover, the r-square being highest for satisfaction ($R^2 = 0.85$) and commitment ($R^2 = 0.91$).

❖ Structural Model for Immobilien.net

As far as Immobilien.net is concerned (see Figure 34), ease of use does not exert a direct significant influence upon satisfaction. This might be due to the fact that ease of use was rated excellent in the case of Immobilien.net when compared to the other two systems.
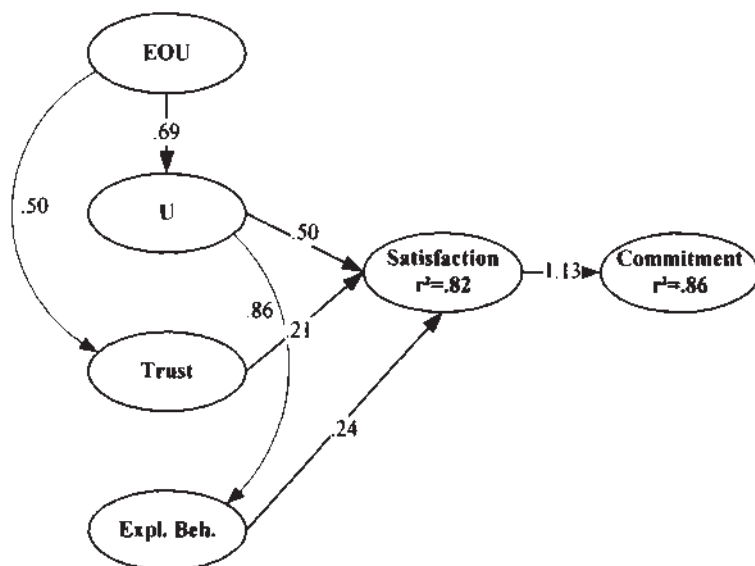
**Figure 34. Partial Structural Model for Immobilien.net
(unstandardised estimates)**

The influence of usefulness on satisfaction was found to be highest for Immobilien.net among the three personalised internet applications. Furthermore, usefulness exerts a strong direct influence on satisfaction via exploratory browsing behaviour (path estimate = 0.86). The implication would be that the

more the real estate platform is perceived to be useful, the more exploratory browsing behaviour is induced. Trust plays the highest role for satisfaction when compared to the other two systems which seems logical because real estate is usually an area in which involvement as well as perceived risk is high.

❖ **Structural Model for Learn@WU**

For the final PIA, Learn@WU, the structural model is presented in Figure 35. A lower indirect influence of ease of use on usefulness and trust was found compared to the other systems. Exploratory browsing behaviour plays a minor role which is obviously due to the fact that students want to use the web site for a goal oriented task (finding learning material, preparing an exam) rather than surfing around.
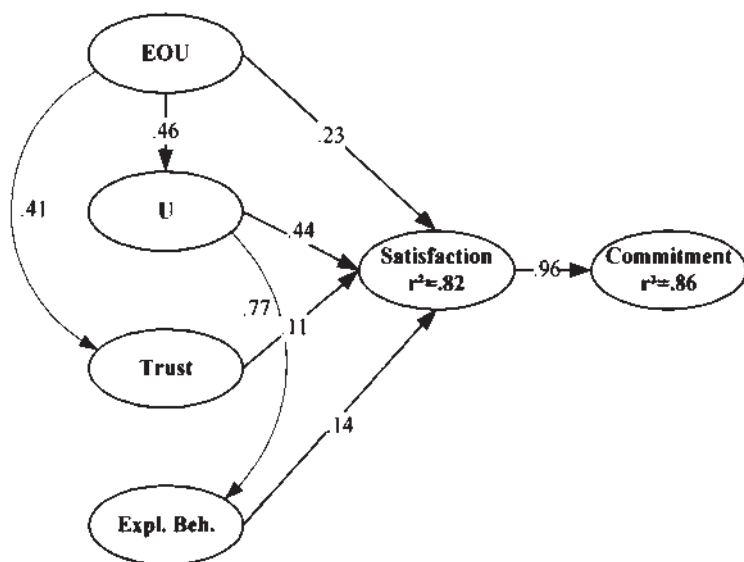
Figure 35. Partial Structural Model for Learn@WU
(unstandardised estimates)

In conclusion, multiple group analyses were used to find out differences in the path estimates of the influencing factors on satisfaction. Usefulness and trust plays the highest role for Immobilien.net whereas the path of ease of use on

satisfaction was not significant and very low (-0.015). Exploratory Browsing Behaviour exerts the lowest influence on satisfaction with Learn. This result reflects the differences of the systems: Immobilien.net and Tiscover both intended to induce exploratory behaviour which is not necessarily the case for Learn@WU.

A quantitative analysis was conducted to examine influencing factors on satisfaction with personalised internet applications. The research model proposed was confirmed, all of the influencing factors play a role. However, some of the relationships among the latent constructs had to be rejected. Particularly the influence of personal characteristics is not as strong as suggested.

Next, results of the expert interviews are outlined which are intended to complement the results of the user survey.

5.3 Expert Interviews

Additional to the user surveys, expert opinions were collected to get a broader point of view and to add some visionary thoughts to the results and conclusions of the study. The objective was to gain the experts' opinions on what will become important in the future. Furthermore, the experts' viewpoints about major challenges, opportunities and drawbacks of personalised systems were collected. About 25 experts (faculty members) from different disciplines (e-marketing, e-business, e-commerce, usability, psychology, computer science, design) were contacted. How were they chosen? A primary goal was to get opinions from different experts and fields as suggested by Flick (1998). Interviewees should represent a certain area and be very different from each other (List, 2005). Therefore, the goal was to get as many opinions from different fields related to the topic of personalised internet applications. Finally, eleven of the experts contacted agreed to participate in an expert interview. The questions were targeted to personalised web sites and comprised the constructs used for the survey.

During a stay as a visiting researcher at the University of Sunderland, UK, these 11 expert interviews were conducted throughout the U.K. The experts came from fields such as e-business, e-marketing, usability or computer science. The interviews were structured according to the constructs of the user survey: ease of use, usefulness, trust and exploratory behaviour. The interviews consisted of a short explanation of each construct to ensure that the interviewer and the

interviewee talk about the same topic. The last question focused on additional factors that play a role either already now or in the future. Moreover, trust was further outlined by asking "Do you think people realise or take attention to if they deal with an https site?" and "Do you think that people avoid buying something via the Internet because of security concerns?" The interview guide is included in the appendix. The statements presented in the following are entirely based on the experts' comments.

This section consists of a general discussion of the method of expert or in-depth interviews. Then, the results of the expert interviews are presented.

5.3.1 Method of Expert Interviews

In-depth personal interview was the data collection method applied. The qualitative method of in-depth interviewing (also known as unstructured or semi-structured and informal interview) is an appropriate technique to gain respondents' point of views, ideas, perspectives or experiences (Berry, 1995; List, 2005). Important characteristics are that in-depth interviews follow a rather flexible approach by asking open questions and encouraging respondents to elaborate rather than restricting the interviewees (Botha, 2001).

For this study a semi-structured interview guide with open questions was employed. The interviews were intended to last for about 45 minutes. However, in most cases, interviews were resulting in interesting discussions being longer than those 45 minutes scheduled.

According to Dey (1993) a qualitative analysis is a process consisting of three steps: describing, connecting and classifying. Therefore, in the present analysis issues are classified according to the same categories like in the user survey. Soon after each interview a summary was written. The next step was to structure the statements according to pre-determined categories applied already in the user survey. Afterwards, statements were categorised in certain sub-topics.

The data collected by the expert interviews is summarised by content analysis. Content analysis can be defined as a systematic approach to receive replicable and valid inferences from text (Krippendorff, 2004; Weber, 1990). A lot of words and text can be compressed and classified into fewer content categories (Weber, 1990). Content analysis is a research tool used to gain new insights or knowledge about particular phenomena by making inferences from texts (Krippendorff, 2004). The method of content analysis can be described as

summarising content of data by counting aspects arising in any form (such as group discussions, text or interviews) of content (List, 2005). The advantage of simplifying statements, summarising and counting them is to decrease subjectivity (List, 2005).

5.3.2 Results of Expert Interviews

The following paragraphs intend to give an overview of the topics mentioned by the experts. They are categorised according to the dimensions applied in the user survey. Each dimension includes several sub-topics introduced by the experts and analysed according to their content. For the sake of better understandability not only single words but also some statements are indicated. They are presented in tables ranked according to their frequency of occurrence. If issues are mentioned just by one expert, they are described in the text; otherwise they are highlighted in the tables.

5.3.2.1 Ease of Use

When thinking of ease of use, experts argued that the structure and hierarchy of information is important. The comparison with a TV or DVD manual was mentioned: first there should be a certain level of basic information and only if needed the user can explore more of the content. The load of information is another crucial issue, it is recommended to use not more than 6 or 7 headings on one site. However, two experts suggested that one should refrain from such general guidelines such as three columns is the accepted format and is the customer's expectation. The type of font is important as well. Sans-serif types such as Verdana are definitely better than e.g. Times New Roman. Download time for files is another crucial issue and should be kept as short as possible.

The difficulty to match users' and designers' expectations at the same time was mentioned. Moreover, the marketing department should be involved as well when deciding about the web site's content and structure (creating a web site is not just a technical issue). Ease of use should also be adjusted to the target market and also to different groups of people including disabled such as colour-blind, not so experienced ones or elderly people. Furthermore, cultural differences do play a role e.g. in navigation. When it comes to different browsers (like Mozilla Firefox versus Internet Explorer) or different computer systems

(like Mac), the web sites should be displayed in all of the systems without problems. Plug-ins should be avoided. In general, a rather older version of programs should be used so that everybody can access the web site easily. The lowest common denominator should be chosen. There are still too many technical messages (e.g. error number 404) and technology should not be used just for technology's sake. One expert suggested that if the web site includes search facilities it could mean that the site's navigation is not good.

When it comes to the visual appearance, the experts mentioned that there should not be too many pictures included in the web site because download time could be increased significantly. Loading time should definitely be considered. Bandwidth was mentioned several times. According to the experts the speed of bandwidth is still an important factor. Studies have shown that after approximately seven seconds users switch to another site although perceptions towards loading time vary across countries, e.g. in the U.K. Three seconds of loading time are usually accepted whereas in China users are prepared to wait for eight seconds. Therefore, the loading time has to be considered, there is still not everybody equipped with broadband connection. A simple web site with fewer pictures, less information is best because users want to scan a web site quickly.

One expert suggested that every page should have the same design because it is possible that the users don't go directly to the home page but enter another page. Furthermore, white space was named which should be included to divide different sections of the web sites. In general, the middle of the web site is most important. There have to be some key points in the web site structure that users can easily scan the web site. Navigation is a crucial issue. However, help functions should be provided. Web sites must be differently structured than tangible, printed media. As far as input forms are concerned it has to be clearly stated what is needed when filling in forms. Users are annoyed when they have to go back (because they have forgotten to fill in something) and all previous inputs are lost.

Another crucial point is to which domain the web sites belong. For some web sites e.g. an online grocery store a certain level of ease of use might be enough. Amazon was named as an example of not being really usable despite its success.

In conclusion, two experts mentioned that one should refrain from sticking to standard guidelines too much. All of the issues which were mentioned more than once (and were described above) are outlined in Table 40.

Table 40. Ease of Use Issues Named by Experts

Ease of Use Issues	Absolute Number of Counts
Ease of use issue depends strongly upon target audience (age, culture, disabilities, familiarity)	7
Bandwidth and loading time are important	6
Structure, hierarchy is important	3
Reliability – is the web site often crashing?	3
Load of information is crucial	2
Difficulty to match users' and designers' expectations	2
Refrain from using standard guidelines	2
Simplicity of the web site	2

5.3.2.2 Usefulness

First, one expert suggested that knowledge about the target market is important to determine which content should be displayed. Objectives are vital; customer expectations do play a significant role. Two different web site versions could make sense, e.g. in the travel industry: one for business and one for leisure travellers (because they usually have different information needs). Furthermore, the place where people are surfing could be taken into account as well, are they browsing the web site at home where they might have more time but lower bandwidth or are they using the web site in the office where the opposite is likely to be the case? This issue was named by another expert as well but in the context of mobile devices. A text only version for mobile devices should be provided. Furthermore, a web site should help to buy, to make decisions and to provide the

information which is needed. A 24 hours availability and instant reply are additional crucial issues expected by customers.

Table 41. Usefulness Issues Named by Experts

Usefulness Issues	Absolute Number of Counts
Accuracy: information which is up to date	3
Different version of a web site: business & leisure, mobile	2
Goal of the web site visit (goal directed vs. hedonic motivations) is important	2

Table 41 outlines that accuracy was perceived as very important by the experts. They also emphasised that content could be structured according to the context in which it is used e.g. business versus leisure travel content.

When they were asked to prioritise between usefulness and ease of use, two of the experts suggested usefulness to be more important and another two experts favoured ease of use being more crucial than usefulness, the others thinking both are equally important or it depends upon the web site context. It was argued that perceived ease of use influences perceived usefulness. Furthermore, both factors depend strongly on the situation and motivation to visit the web site. The objective is crucial: is the visit just about surfing around or is it rather a goal-oriented visit? The user might tolerate shortcomings easier if they have no alternative or not a lot of choice for a certain type of web site.

5.3.2.3 Trust

Three of the experts stated that paying via the WWW is as risky as giving away your credit card in a restaurant (see Table 42). If a third party is doing the payment procedure it is also problematic because then the user is taken to another site. A lot of people know about the importance of secure connections and transactions. However, it depends upon the whole web site, the site design

rather than on technical aspects. Is the site as a whole trustworthy, for instance a logo might be helpful. A brand or trademark plays a role – is the web site provider a small company or a reputable one? Is it a newly established company or a well-known one? Trust is more about the perception than about the reality. Perceived trust strongly depends upon the circumstances, the nature of activities, the perception a user gets from the web site. Furthermore, a statement which technology is used and how privacy is protected and security is ensured could be useful. An imprint (containing information about the organisation, their address and goals pursued with the web site presence) and contact numbers or call back service could help to build up trust and credibility. Phone or fax numbers should be indicated to make complaints or feedback possible via traditional channels as well.

Trust statements or certificates should be placed very prominently because users usually have a natural distrust and there is still some reluctance to buy via the WWW because of trust issues.

Trust issues do play a particular role for new web sites, it is not only about payment and personal data but also the objectiveness of the content is crucial. Furthermore, commitment and honesty are important. When thinking of trust the whole experience could be included (also the service before and after an online purchase). The level of caution depends also upon the type of web site. However, in general, people are quite cautious and do not store credit card details. The crucial question is: who is listening in (and not who is the vendor)?

Trust is extremely important concerning bookings and e-commerce. Several experts agreed that fraud and crimes committed via the Internet will even rise in the future. Even if people have trust in a company they do not automatically trust the payment procedure. The focus will be set more and more on certificates. For small companies it will be easier to have a contract with secure transaction businesses. Web site owners not providing secure connections will soon have the reputation of being unprofessional.

Furthermore, four experts were convinced people do not yet pay attention to encrypted web sites (e.g. https). However, two suggested that the majority of people do so. The majority of the experts agreed upon the statement that people avoid buying via the Internet because of security concerns. However, it was suggested that it depends strongly upon the type of products or services purchased, e.g. in the case of books and CDs it is quite common and convenient to buy via the WWW whereas it is less common to buy clothes. One expert suggested that the importance of trust and security is far too much exaggerated

and two of the experts emphasised that the online world is as secure as the offline one.

Table 42. Trust Issues Named by Experts

Trust Issues	Absolute Number of Counts
People still avoid buying via the Internet because of trust concerns	9
Is it a reputable web site/company or a small, newly established?	5
Conventional ways (e.g. the phone) are used instead of the WWW to purchase although the information is obtained via the WWW	4
More risky to give away credit card in restaurants	3
Privacy, security policy or liability statement could help to increase trust	3
Phishing, fake web sites make users worrying	2
The whole impression of the web site is important	2
Trust plays a higher role for older people	2
Trust is the most important influencing factor	2
The WWW is as secure as the offline world	2

In conclusion, trust and security concerns were a major issue for most of the experts which can also be noted by the amount of topics mentioned by them. An increasing number of fraud incidents will make these concerns even more significant in the future.

5.3.2.4   Exploratory Browsing Behaviour

Pleasing experiences are necessary for some domains in the offline as well as in the online environment. Especially the retail online environment is predestined to create an inviting, encouraging atmosphere. Furthermore, the longer a user stays the more he or she probably buys. The entertainment factor, hedonic and experiential aspects are clearly underutilised at the moment. "Funology", "Enjoyability" may override other influencing factors according to one expert's opinion. However, one limitation is that the online environment cannot appeal to all of the human senses, e.g. smelling.

One expert suggested that aesthetics play without a doubt a significant role for web site satisfaction. Another stated that the goal pursued with the web site visit is crucial to assess if exploratory browsing behaviour is important to satisfaction. For web sites predominantly used in leisure, exploratory browsing behaviour could be an influencing factor whereas for work related web sites it is less likely. Furthermore, whether exploratory browsing behaviour is important or not depends on the audience and the attitude of the users. Fun is not an essential factor if it detracts from usefulness it is rather a hindrance. One expert guessed that for 80% of the web sites exploratory browsing does not have any influence.

Furthermore, time might be the more important issue which prevents users from exploring the web site. On the other hand, an important factor is that the web site is able to draw and hold a user's attention, spark interest and make inquisitive. One expert suggested that the issue of fun and exploratory behaviour depends upon demographics and age. It is important for younger users but less important for older people.

In conclusion, the majority of the experts thought that fun, excitement, exploratory browsing, experiential aspects could be an additional factor but does not have top priority. The whole purpose or message of the web site should not be forgotten and fun aspects should not be exaggerated when designing the web site. Two of the experts even thought that fun could be irritating or constitute a hindrance to use the web site properly. According to one expert a web site has to be as simple as possible and fun does not produce any value-added. However, there might be contexts in which fun or exploratory browsing behaviour play a role, e.g. in travel.

Table 43. Opinions on Exploratory Browsing Behaviour

Exploratory Browsing Issues	Absolute Number of Counts
Aesthetics, pleasing experiences are important	3
Goal is crucial	2
Time is usually more important	2
Type of web site (e.g. for leisure web sites more important)	2
Demography-dependent	2
Fun attracting parts of a web site could be a hindrance or irritating	2

5.3.2.5 Additional Crucial Factors and Outlook

Finally, experts were asked if they think there are other crucial issues previously not mentioned and issues they think would become important in the future. As far as the Uniform Resource Identifier (URI) or domain names are considered it is not too important for Europe but in the U.S. users do look at domain names, according to one of the expert's assessment. Another expert stated that the URI name is a major issue also contributing to credibility (see Table 44). Furthermore, the web site should seem professional; a personal touch is very dangerous, though it depends upon the culture of the company. The web site could be light-hearted, informal if the company is as well. However, it should not be jokey or funny. The competition is just only one click away, so everything that could upset customers should be avoided. Pop-ups are a good example; they are usually annoying the customer rather than helping.

The web site should fit into the e-business strategy and is not just a marketing tool any more nor is it a technical issue. Furthermore, what drives satisfaction is different among different domains and the perception of satisfaction and its influencing factors changes very fast.

There should be a certain level of value for both the user and the company. For the customers the most common value is the usefulness of the web site. For the company the main value would be to sell something, to provide a confident picture of the company or the diffusion of good image. For companies it could be important to explore niche markets.

The empowerment of users is important; they want to be in control of what they are doing. Furthermore, word of mouth could be crucial meaning users are recommending the web site to others. Virtual communities like Google or Yahoo were predicted to increase in importance in the future. Personal contact possibilities were mentioned and the possibility to give feedback. Links to other web sites could make sense. Finally, a competitive advantage could be to present novel information, products or services.

Table 44. Further Crucial Issues

Other Issues	Absolute Number of Counts
Personalisation should be possible (but should not be a must)	3
Domain name is important	2
Visuals, graphics, colours	2
Sophistication/Professionalism, the web site has to have a good quality, e.g. maps	2

In conclusion, opinions on the most important influencing factors on satisfaction with personalised internet applications were different. However, exploratory browsing or fun aspects were prioritised by only one expert. Usefulness and trust were both explicitly named as being most important by two experts. Ease of use was not explicitly mentioned as being the most important factor. However, the number of comments on ease of use suggests a high level of significance.

6 DISCUSSION AND OUTLOOK

6.1 Conclusion

The conclusion will briefly summarise the core constructs of the research model and the outcome of the analyses. Furthermore, the importance of this study will be outlined and which implications are expected.

There is a vast amount of information on the Internet and it becomes more and more important to offer convenient tools for the user to filter out relevant information. Recommender and personalised systems offer the possibility to propose the user targeted and tailored results. These types of web sites are more complex than usual ones and therefore need thorough investigation.

The study aimed to test a comprehensive explanatory model for system satisfaction including several system and personal factors. A research model and its dimensions were proposed on the basis of existing studies. The measurement scale was developed by using items applied in previous studies or by suggesting own questions and pre-testing them. Finally, a user evaluation of three personalised internet applications was conducted and the online user survey resulted in a sample size of 1386. Structural Equation Modelling was used to identify important influencing factors on system satisfaction with three personalised internet applications. However, the scope of the findings can be much broader and of general significance for PIAs, since the ones used for the evaluation stem from three different areas.

First, the construct of usefulness is a necessary characteristic and was found to have the highest influence on satisfaction with a personalised internet application. A system can be very easy to use but if the information contained is not relevant or up-to-date it is useless. On the other hand, ease of use or system quality does play an important role as well. If information is not found, it is once again useless. Trust is a significant construct because of the increasing sales function of the Internet but also if the focus is on a high risk product or service like real estates. Hedonic benefits, like exploratory browsing behaviour (EBB) can play a role as well although the influence varies across systems. The influence of EBB for the e-learning platform was rather low compared to the travel web site and the real estate platform. This assumption seems logical: EBB does not play a role for personalised internet applications predominantly used for

goal-directed behaviour. Finally, personal characteristics such as experience and attitude towards the Internet have an influence when interacting with a website. However, the effect hypothesised was stronger than it turned out to be when tested with empirical data. Internet familiarity served only as antecedent of attitude towards information search via the WWW and had a negative impact upon EBB. The assumptions that internet familiarity also exerts a direct influence upon satisfaction and an indirect via trust, usefulness and ease of use were not confirmed. Attitude showed no direct influence on satisfaction either but indirect effects were found via usefulness and trust.

The method of expert interviews was used to complement the results of structural equation modelling. Furthermore, opinions about future developments, challenges, risks and opportunities were captured by the expert interviews which would not have been possible to gain by the user survey. The majority of the experts considered ease of use still as one of the major influencing factors when looking at the number of issues named. However, they argued that trust will become increasingly important in the future because more and more cases and types of internet fraud arose. Moreover, issues like domain names, personalisation, visual appeal and sophistication when designing the web site were mentioned.

6.2   Implications for Practitioners

What are the implications for providers of personalised internet applications? Results can provide proposals to design recommender and personalised systems more satisfactorily for the user. Structural Equation Modelling showed that usefulness is still the dominant factor positively influencing satisfaction with personalised internet applications. Therefore, the content of the personalised internet applications should be kept as accurate and helpful as possible no matter in which domain the provider is operating.

Exploratory browsing should be facilitated depending on the web site. As shown in the multiple group analysis it does play a more important role for the real estate web site and the travel platform which both offer a lot of information additional to the search of real estate or travel products and services. However, in the case of Learn@WU its effect was rather negligible.

Trust had a higher influence on satisfaction with the real estate platform compared to the other two systems. Thus, for high risky products or services like real estate are, special attention should be paid to trust building cues like certificates or security and privacy statements (as mentioned by the experts).

Attitude towards information search via the WWW and the use of e-service and Internet familiarity serve as antecedents for usefulness, trust and exploratory behaviour. Personal characteristics did not have a direct influence on satisfaction. This could be a good result for the providers of personalised internet applications because they cannot or can only hardly influence personal characteristics (e.g. expectations could be influenced to a certain degree).

In conclusion, ease of use and usefulness do play a role for most (if not all) web sites or personalised internet applications. The effect of trust towards the web site and how information is processed strongly depends on the type of web site. The same is true for exploratory browsing behaviour.

6.3 Limitations and Implications for Future Research

One of the obvious shortcomings is that the sample consists of rather experienced users. Furthermore, the number of study participants already knowing the web sites was rather high considering the way how people were invited to answer the questionnaires. Newsletters and postings at the respective web sites were primarily used to encourage people to participate in the user survey. Therefore, the inclusion of a higher number of study participants who are not particularly familiar with the Internet and who don't have knowledge of the respective web sites could be fruitful and offer new insights.

Future studies could concentrate more specifically on recommender systems which was not the case in this study. The availability of recommenders (particularly German systems) was not given and therefore, the requirements were lowered and the study focused on personalised internet applications. However, recommender systems are often handled as the type of systems having most potential to create a satisfactory online user experience. Therefore, further research on the influencing factors on satisfaction with online recommender systems should be conducted.

As far as the research model is concerned, further research from the methodological point of view could involve Inferred Causation Theory (ICT).

Directions of causality could be checked as proposed by Pearl (2001). Moreover, latent class analysis could be applied with the goal to either confirm the grouping because of the different samples (different web sites) or if grouping based on other personal characteristics of the sample such as attitude or experience is more appropriate.

In future studies the type of internet application could be considered more explicitly and different types could be compared to each other in terms of usefulness or hedonic aspects. Is it a web site which is rather used for goal directed behaviour or which should also provide some kind of fun? The influence of exploratory browsing behaviour or trust is likely to vary across systems.

What is the most appropriate construct to measure hedonic related aspects or intrinsically motivated user behaviour? Further research could focus on the constructs of Exploratory Browsing versus enjoyment, playfulness or Flow because their influence could become even stronger in the future.

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Appendix

Interview Guide for the Expert Interviews

First, the purpose of the study and the user evaluation was outlined. Second, a definition of each of the constructs was given to ensure that interviewer and interviewee talk about the same topic.

(**Ease of Use:** the system's use is possible without great effort, the system's use is easy to learn, navigation path is clear

Usefulness: using a specific application will help to solve a specific task satisfactorily (accurate, meaningful, helpful information))
- Do you think Ease of Use and Usefulness serve as preconditions to achieve web site satisfaction? (meaning the web site has to be at least easy to use and useful to avoid dissatisfaction.)

(**Trust:** in that sense that personal data is treated carefully, if it is an e-commerce site payment is processed securely)
- Do you think people realise or take attention to if they deal with an https site?
- Do you think that people avoid buying something via the Internet because of security concerns?

(**Exploratory browsing:** interaction process, search process, satisfy curiosity, always know about the latest trends, offers, fun, joy of discovery, exciting, discover novelties)
- Do you think that factor has an impact on web site satisfaction (either in a positive or negative way)?

- Finally, are there are any additional factors you would consider as crucial for web site satisfaction?

Learn@WU Questionnaire

Herzlich Willkommen zur Befragung über Learn@WU

Das Institut für Tourismus führt in Zusammenarbeit mit Learn@WU eine Studie über die Zufriedenheit mit Web-Angeboten durch. Ihre Daten werden vollkommen anonym ausgewertet. Als Dankeschön für die Teilnahme an der Befragung werden unter allen Teilnehmern 30 x 2 Kinogutscheine verlost!

Zuallerst bitten wir Sie, dass Sie sich in folgende Situation versetzen:

Stellen Sie sich vor, Sie wollen in Kürze zur Prüfung "Marketing I" an der WU antreten. Daher möchten Sie sich mit Hilfe von Learn@WU einen Überblick über den Prüfungsstoff verschaffen.

Nun bitten wir Sie https://learn.wu-wien.ac.at/ zu öffnen (ohne das Fenster mit der Befragung zu schließen!) und sich einzuloggen. Versuchen Sie nun, sich von Learn@WU alle relevanten und interessanten Informationen zur Prüfung zu besorgen. Danach kehren Sie bitte zum kurzen Fragebogen zurück und beantworten Sie ihn (Beantwortungsdauer ca. 5 Minuten).

Vielen Dank für Ihre Teilnahme!

Nachdem Sie nun die Unterlagen mithilfe von Learn@WU gesucht haben, beantworten Sie bitte die nachfolgenden Fragen.

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Im Großen und Ganzen finde ich, dass dieses Web-Angebot leicht zu bedienen ist.	O	O	O	O
Dieses Web-Angebot ist benutzerfreundlich.	O	O	O	O

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Die Struktur dieses Web-Angebots ist verwirrend.	O	O	O	O
Die Bedienung von Learn@WU ist von neuen Benutzern leicht zu erlernen.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Im Großen und Ganzen empfinde ich dieses Web-Angebot als nützlich.	O	O	O	O
Die Benutzung von Learn@WU hat mir die Suche nach Lernunterlagen wesentlich erleichtert.	O	O	O	O
Dieses Web-Angebot ermöglicht es mir, rasch die für mich interessanten Informationen zu finden.	O	O	O	O
Dieses Web-Angebot erhöht die Qualität meiner Informationssuche.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie
bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Dieses Web-Angebot bringt mich auf neue Ideen.	O	O	O	O
Dieses Web-Angebot fördert meine Kreativität.	O	O	O	O
Dieses Web-Angebot macht erfinderisch.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie
bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Dieses Web-Angebot vermittelt das Gefühl, dass mit meinen persönlichen Daten mit größter Sorgfalt umgegangen wird.	O	O	O	O
Ich vertraue den auf Learn@WU angegebenen Informationen.	O	O	O	O
Ich habe das Gefühl, dass dieses Web-Angebot sicher ist.	O	O	O	O
Dieses Web-Angebot vermittelt das Gefühl, dass es mit den besten Sicherheitsstandards ausgestattet ist.	O	O	O	O
Die Vorschläge (Suchergebnisse) des Web-Angebots waren für mich nachvollziehbar.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Der Besuch dieses Web-Angebots war eine willkommene Abwechslung für mich.	O	O	O	O
Dieses Web-Angebot hat mich inspiriert.	O	O	O	O
Dieses Web-Angebot hat meine Neugier geweckt.	O	O	O	O
Die Benutzung von Learn@WU war spannend für mich.	O	O	O	O
Dieses Web-Angebot hat mir einiges an Neuem geboten.	O	O	O	O
Die Benutzung dieses Web-Angebots war wirklich ein Vergnügen.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Ich bin mit dem Erfolg meiner Informationssuche zufrieden.	O	O	O	O
Im Großen und Ganzen habe ich positive Erfahrungen mit der Benutzung von Learn@WU gemacht.	O	O	O	O
Dieses Web-Angebot war in der Lage, mich von der Qualität der	O	O	O	O

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Vorschläge (Suchergebnisse) zu überzeugen.				
Dieses Web-Angebot entspricht meinen Erwartungen.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie bitte die Antworten auf der vorgegebenen Skala ab.

	Ich bin sehr zufrieden 🙂	Ich bin eher zufrieden	Ich bin eher unzufrieden	Ich bin sehr unzufrieden ☹
Wie ist Ihr Gesamteindruck in Bezug auf das Web-Angebot?	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Dieses Web-Angebot kann ich nur weiterempfehlen.	O	O	O	O
Ich werde dieses Web-Angebot wieder aufrufen.	O	O	O	O
In Zukunft werde ich dieses Web-Angebot noch öfters benutzen.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf das Web-Angebot Learn@WU stufen Sie bitte die Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Ich bin aufgrund vergangener Nutzung mit Learn@WU vertraut.	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf Ihr Verhalten in Bezug auf das WWW, stufen Sie bitte Ihre Antworten auf der vorgegebenen Skala ab.

	Täglich	Mehrmals pro Woche	Mehrmals pro Monat	Seltener
Wie oft benutzen Sie das WWW im Durchschnitt?	O	O	O	O
	Sehr erfahren	Erfahren	Wenig erfahren	Nicht erfahren
Würden Sie sich selbst als erfahrene/n WWW Nutzer/in bezeichnen?	O	O	O	O

Je nach Zutreffen der einzelnen Aussagen auf Ihr Verhalten in Bezug auf das WWW, stufen Sie bitte Ihre Antworten auf der vorgegebenen Skala ab.

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Das WWW für diese Art von Aufgabe zu verwenden, halte ich für nützlich.	O	O	O	O
Die Informationssuche im WWW ist für mich mit einem zu hohen Zeitaufwand verbunden.	O	O	O	O
Ich finde es nützlich, mir	O	O	O	O

	stimme sehr zu	stimme eher zu	stimme eher nicht zu	stimme gar nicht zu
Lernunterlagen im WWW zu besorgen.				

Beantworten Sie nun bitte zum Abschluß noch einige Fragen zu Ihrer Person.

Ich bin:

- ⊂ weiblich

- ⊂ männlich

Mein Alter ist: ⌐

Meine derzeitige Beschäftigung ist: | bitte auswählen ▼ |

Meine höchste abgeschlossene Ausbildung ist: | bitte auswählen ▼ |

Falls Sie an der Verlosung von 30 x 2 Kinokarten teilnehmen wollen, geben Sie bitte Ihren Namen und E-mail Adresse an (Ihre Daten werden ausschließlich für diese einmalige Verlosung verwendet!):

Name:

E-mail Adresse:

Vielen Dank für Ihre Teilnahme!

Die Befragung ist nun beendet - Sie können das Fenster jetzt schließen.