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User experience with Intranet information technology in organizational context

-Summary-

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Contents

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Introduction

In the context of an ever increasing interest in the information technology and especially in its application in the organizational field, this study proposes to analyze the characteristics, the challenges and the dynamics of users experience development in relation with intranet technology interactions within organizations. The investigative steps of this study root from an analysis of the Romanian scientific research on human – computer interaction. Further on, it focuses on investigating the ability of the user experience model to explain the psychological mechanisms involved in building evaluations and behaviour patterns towards technology, through comparison with other theoretical constructs, as well as through relating to specific organizational factors. The results revealed not only the user experience model adjustment to the organizational context and the intranet technology, but also raised new research questions intended to develop and deepen the model functioning within organizational context.

Chapter 1

Research on Intranet technology in organizational context. Conceptual approaches.

This chapter focuses on a close analysis of the existing studies. It reveals that the main studies that have tackled the subject of Intranet technology in an organizational context have concentrated on the implementation process of this technology.

Four major approaches are highlighted: contextual approaches, social phenomena approaches, approaches based on specific processes of technology implementation and individualistic approaches.

Preliminary study

Considering that taking sides with one approach or another is not recommended in the incipient phases of our research, and keeping in mind the complexity, the emergent and interactive character of Intranet technology, the solution presented in the beginning was to use multiple perspectives as analysis grids applied over the same reality. Starting with an analysis of the strong and weak points for each conceptual approach, but also of their contradictory parts, we have suggested a multi-levelled analysis frame for guiding our exploratory venture.

Method

The method we selected for this study was the exploratory case study (Yin, 1989; Walsham, 1993).

Participants

18 employees of a commercial bank branch in Cluj-Napoca participated to this study. They were representing all the departments under observation.

Data collection instruments

The case study herein meant applying multiple methods:

1. an analysis of organizational documents
2. participatory observation

3. semi-structured interview

Results and implications

According to the acquired results of this first investigation, the main identified challenges in studying the use of the Intranet in organizational context are related to:

a. *Identifying the existing approaches regarding the shaping of perception over the information technology on an individual level.*
b. *Identifying a model to explain the mechanism of perception formation and the mechanisms through which the contextual factors can contribute to forming the perceptions and the behavior of use.*

Chapter 2

Study perspectives on user perception regarding interactive technologies

Inside the field of research of the interaction processes, people or users' perceptions of the interactive systems play a key role. Classically speaking, these perceptions were extensively studied by two paradigms: the usability (or satisfaction) paradigm and the acceptance of the technology paradigm (Wixom & Todd, 2005). The two are related to each other, most of the times the classic models of the acceptance of the technology asserting a linear relation between user satisfaction and technology acceptance (Davis, 1986). Recently, another imposing line of research has started to develop, mainly focusing on aspects related to the entire user experience of the technology (Hassenzahl, 2008; Hassenzahl, 2004; Hassenzahl, 2002; Draper, 1999; Gaver & Martin, 2000; Jordan, 2000; Monk & Frohlich, 1999) and concentrating on some aspects of this experience that go further than simply solving tasks with the help of interactive technology.

Usability, satisfaction and Intranet use. Lessons learned from adaptation of scales (Preliminary study 2)

One of the main issues identified during the first preliminary study was the one related to difficulties in accepting and using the new Intranet technology. The studies specialised in the HCI field indicate an important connection between the usability level and the acceptance of a technology/system (van Welie, 2000; Benyon et al., 2005). And the TAM model implies the existence of certain technology features (usability) that substantiate the perceptions of utility and easy use. As a result, usability becomes a key concept in understanding the acceptance of the Intranet technology in organizational context.

The analysis of specialised studies revealed the existence of various definitions of system usability, so satisfaction refers exactly to a subjective systems evaluation and is directly related to comfort and acceptance of technology use by the end users.

One of the preliminary goals at this stage was adapting a satisfaction questionnaire "Intranet Satisfaction Questionnaire" (ISQ) and a usability questionnaire "Software Usability Measurement Instrument" (SUMI), especially designed for the Intranet, to Romanian. The main goal was to later use these measurements inside an extended model of technology acceptance in order to investigate the way in which the Intranet features, the user perceptions and behaviour explain the acceptance of technology in an organizational environment. Due to

difficulties raised in the adaptation process, the second objective was dropped. The results indicated the need of a shift of the research interests towards clarifying the research models offered by this field and also to conceptually clarifying the constructs which form the basis for these instruments.

Method

Participants

66 bank employees with an average age of 32 participated in this study.

Instruments

Chestionarul de satisfacţie faţă de tehnologia intranet – represents the Romanian adaptation of the *Intranet Satisfaction Questionnaire (ISQ)*.

Chestionarul de evaluare a utilizabilităţii tehnologiei intranet – is an instrument especially developed for measuring the Intranet software usability, starting from one of the best known instruments for usability evaluation, the Software Usability Measurement Inventory (Kirakowski & Corbett, 1993) and was tested on a pilot sample group (Hodorog, 2006).

Results and conclusions

In regards to the internal consistency of the scale, the obtained value ($\alpha = 0,89$) is almost identical withthe onesobtained by Bargas-Avila and Lotscher (2006): $\alpha = 0,89$, N=881 and $\alpha = 0,84$, N=127. Thus we can safely say that the translation did not affect the way of interpreting the items which consistently measure the same construct – user satisfaction with the Intranet.

From a validity perspective, the construct validity test was chosen. A way of investigating this type of validity is represented by the convergent and discriminatory validity coefficients.

The analysis of the results indicates a strong convergent validity (r=0,76**) but also a poor discriminatory validity (correlations between 0,65** and 0,82** with scales designed to measure aspects of technology competency).

An exploratory factorial analysis was performed through the extraction of main components method, to see if the Intranet technology satisfaction is a one-dimensional construct.

A factorial analysis on main components was effectuated. Only factors with an Eigenvalue over 1 were kept. The factors' orthogonal rotation determined the factorial structure presented in table 4. The first factor explains 35% of the variation and the second one 29%. The first factor seems to be built out of those items which reflect satisfaction owed to the ease of use of the Intranet, and the second one the satisfaction owed to efficiency.

Thus, we can say that the scale validity remains to be investigated in future studies, a straight conclusion could not be drawn from these data.

However, exactly these coefficients of convergent and discriminatory validity which, together with the results from the exploratory factorial analysis which missed to confirm the one-factorial structure of the original scale, leave the validity issue of the scale construct unsolved, may become very useful in a critical analysis of this undertaking. The starting point for this critical analysis is the very clear specification of the term: validity of construct.

A critical reconsideration of the usability concept starting from the convergent and discriminatory validity results.

Starting from the meaning of the validity of construct and from the highlighted issues connected to it, in this section we brought forward the reasons found at the basis of these coefficients. We showed at the same time that these results even challenge the measured core concepts – satisfaction and usability, making their reconsideration necessary.

An idea regarding possible solutions in this transition raises from abandoning the term of usability and moving towards the user experience one (Hassenzahl, 2002). This concept shifts the attention from the results of technology appreciation so far discussed on a usability level to the psychological mechanisms that can justify the appearance of these results.

A synthesis of the main objectives of research after considering and incorporating the preliminary study results.

Starting with a wish to investigate the challenges associated with the implementation of the Intranet information technologies in a Romanian organizational context, the preparation and specification of the research tasks led to results which came to modify the initial coordinates of the proposed subject.

The accordance between preliminary results and the observations present in scholarly literature which confirm the suspicions related to the validity of construct (Gray & Salzman, 19981, Hornbæk, 2006), but also a certain tradition in not respecting the scientific rigors regarding the foundation of conceptualization and measurement in previous contributions and also in the correctness of reporting data related to the faithfulness and the validity of measurements (Hornbæk, 2006) raised question marks regarding the scientific research conduct that defines the HCI field. Making use of the incipient phase of Romanian research in human – computer interaction field and its following of international standards, we considered that a critic analysis of its results will increase our understanding of the way in which some of conceptual ambiguities and deficiencies of the measurement models emerged in the national and international scientific communities.

As a result, a prime objective of this study is a critic analysis of the directions, of the general methodological approaches and of the usability concept approach in human – computer interaction field in Romanian scientific research between 2004 and 2009.

Beyond the scientific research attitude that defines this field, the issues reported on the validity of content level led to a critic analysis of the manner of construction of measuring instruments for usability and satisfaction and of the conceptual content of items.

In consequence, a second objective of the study is the examination of the relation between the main constructs which investigates the user perceptions regarding interactive technologies (usability, user satisfaction and user experience). Within this, a specific objective is testing the explanatory and integrative potential of user experience model in connection with the constructs of usability and satisfaction.

Last but not least, our critical analysis has highlighted the user experience model's ability to explain interactions with the interactive technology even in an organisational environment, where we expect that the aspects related to tasks to be most relevant. At the same time, based on the model, mechanisms can be derived. Through these mechanisms organisation specific factors, like those related to organisational culture can intervene in the formation of perceptions and the consequences of these perceptions on a cognitive, emotional and behavioural level.

Based on these arguments, a final core objective of the study consisted in investigating the validity of the user experience model in an organisational context. More specifically, we wanted to check whether the model's predictions in terms of forming evaluations in regards to technology but also to behaviour of use are supported in the case of Intranet technology in organisational context, too. We also wanted to verify the moderating role of organisational culture variables in the relation between the perceptions on Intranet and the results on an cognitive and behavioural level.

Each of the three main research objectives is followed through in the next three chapters of the study. Each provides a more detailed conceptual support of the objectives, but also the hypothesis and specific secondary objectives associated to each major objective, as well as the research results and their implications on a theoretical, empirical and practical level.

Chapter 3

An analysis of the Romanian research in the field of human-computer interaction in the 2004-2009 period. Trends, methodological approaches and development directions.

Objectives

- Investigation of topics, scientific research type and the method of approach of usability promoted in the Romanian scientific comunity in the HCI field in the 2004-2009 period.
- Comparative analysis of the topics and type of research promoted in the Romanian scientific comunity and of the ones identified in the international comunity.

Method

Our research included a number of 274 articles, processed through the content analysis method based on multiple coding criteria which will be described in the following sections.

Coding schemes

Coding scheme of article topic

To ensure a systematic analysis of the studied articles, we have used as coding scheme the conceptual framework of the HCI discipline proposed in the *Special Interest Group on Computer Human Interaction – SIGCHI* for the orientation of education and research in this field.

Coding scheme of research type

In order to asses the types of research, we have used the types of research framework proposed by Alavi & Carlson (1992).

Coding of data connected to the usability study

The studies that have dealt with the issue of usability have been identified and we have registered the work definition of usability, measurement instruments of usability, data processing techniques, the number of users included in evaluation and the conclusions extracted from the data.

Other analysis criteria

In the end, we have used data related to the authors of each article in order to determine their affiliation and their basic field of training. As coding criteria we have used the academic - non-academic criterion and the one about the basic training in the technical or

social sciences fields. Subsequently, based on these last criteria we could also evaluate the interdisciplinary degree of the research colectivities represented by each of the considered articles.

Procedure

The coding process and the evaluation of the agreement between the inter-evaluators

The general agreement coefficient between inter-evaluators was 0,73 which represents an acceptable value. All disagreements highlighted by evaluating the agreement degree between inter-evaluators have been solved through discussions.

Results

The results revealed the fact that most of the published articles in Romania in the field of human-computer interaction rather cover topics related to design, the information systems and the human-computer interface architecture. Overall, the gathered and analysed data indicate a prevalence of the contributions coming from the technical field to the field of human-computer interaction.

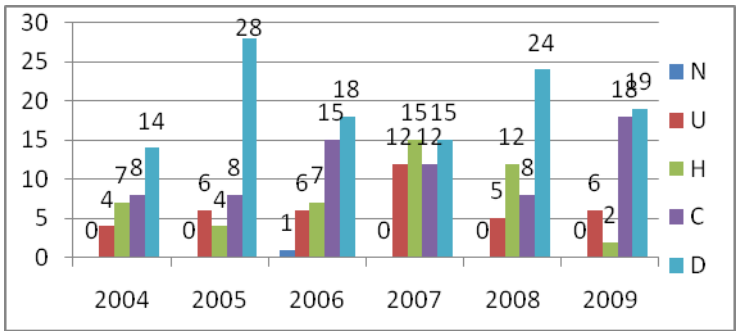

Image 3.2. The results of the distribution analysis by fields and years.

Predominant types of research

It can be noted that the number of empirical studies is much higher than the one of non-empirical approaches. At the same time, we can see that the most part of empirical approaches is represented by researches focused on objects, descriptions of technical systems and solutions in this case, and less focused on events or processes (which usually makes a scientific research). It can also be observed that the number of empirical research focused on process is constantly less even than the number of non-empirical research, which is rarely the case in a scientific field.

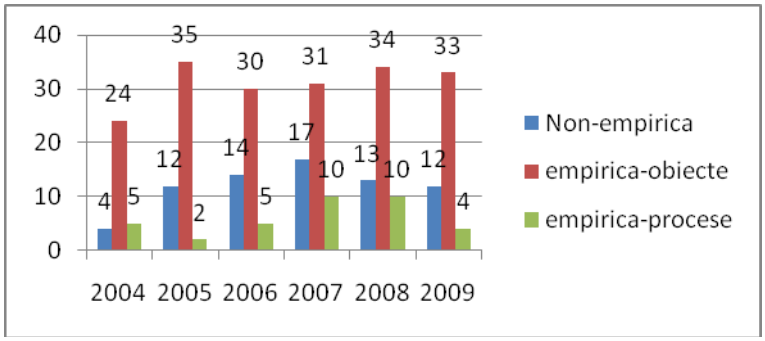

Image 3. The evolution in time of the research types prevalence.

Author affiliation

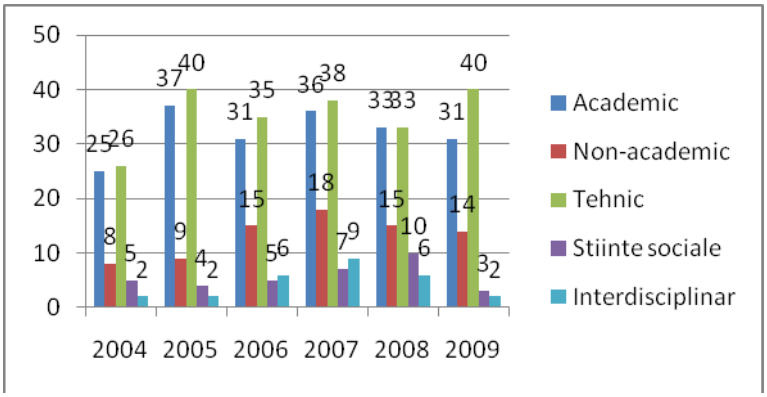

Image 3.4. Author affiliation based on academic vs. non-academic and basic training (technical, social sciences and interdisciplinary coverage) criteria

The usability concept approach in Romanian research

A 17,15% percentage of the analysed articles have usability as topic of interest. Their numbers more or less remained the same over the years, with the exception of 2008 when the interest for this concept spiked. What is noticeable, is the fact that not all the articles draw conclusions over usability (11,76%), which indicates that in some articles, usability is used as a side concept. In a following stage we investigated the definitions given for usability. 17 of the articles (36,17%) which tackle the usability concept do not actually offer a definition for this concept that underlies their approach. What can be noticed here is that most contributions are based on a definition originated in the quality standards of technology and less on definitions derived from a careful research of the concept.

Also, out of the total number of articles dealing with the usability concept, 24 articles (51.06%) do not measure in any way or do not specify the way of measuring usability. In terms of data analysis methods resulting from the evaluation of usability, 29 articles (61.70%) do not report the methods used for data analysis.

Discussion and conclusions

What can be seen overall based on our results is that over the years since the emergence of the community of interest in the human-computer interaction and of the publications meant to disseminate the scientific efforts, the scientific contributions and the activity of this community have been constant. Also, our data do not show a clear direction of evolution in this field, but rather a tendency to maintain the initial configuration of this domain. We consider that our results, which indicate in more that one way an immature state and a slow emergence of this field, can stimulate a reflective reconsideration of the field and an active attempt to redirect the field and draw it closer to the configuration promoted internationally and to the trans-disciplinary standards in scientific research.

Relating the Romanian HCI field to international trends

A first observation that could be revealed was that a strong focus on the subjects connected to design is present also in the international scholarly reviews in the HCI field (Norman, 1994; Shackel, 2009).

Even internationally, the focus of the research lies on presenting new technologies or new applications on existing technologies (Wittacker et al., 2000). Furthermore, the analysis of content carried by Newman (1994) showed that unlike other disciplines where there is a similar direction (fields of engineering research such as thermodynamics or aerodynamics), the HCI field shows a particular feature. In the case of HCI, only a small part of the articles focusing on technology were based on previous discoveries and research. Most part of the articles were reporting radical or innovating solutions or describing experiences and heuristics related to these radical solutions. Wittacker et al. (2000) interpret the results of Newman (1994) as signalling a major issue for HCI: the hindering of the development of a HCI science. As a result, although radical inventions are necessary for the evolution of a very dynamic discipline, the basic research which allows the construction on the fundaments of what other authors had done is as essential for the maturation of the discipline.

Chapter 4

Usability, satisfaction and user experience. Different paradigmes or elements of the same phenomenon?

Our endeavour aims to contribute especially to the reflective analysis of the relation between these concepts so popular in the HCI field. The main purpose is to identify the degree in which these concepts concern different phenomena and represent distinctive elements within the same phenomenon.

To answer these questions we designed a comparative study in two stages.

The main objective for study 2A was the translation and adaptation in Romanian of the AttrakDiff 2.0 questionnaire and of the SUMI and QUIS inventories, as well as verifying the psychometric qualities and their factorial structure. In the second stage (study 2B) we have targeted the testing of causal structure validity introduced by the user experience model by using two sets of data (Attrakdiff 2.0 vs. SUMI & QUIS).

Romanian adaptation of instrumets of evaluation for user usability, satisfaction and experience (Study 2A)

Participants

213 regular students or master students at the Faculty of Psychology and Educational Sciences participated in this study and had repetitive interactions with the interactive product under evaluation - the Psychology department's web site (www.psychology.ro). Due to the sensitivity of the modelling procedures into structural equations, when incomplete data occured, we eliminated incomplete protocols, and were left with a sample group of 152 processed responses.

Instruments

In this study, we have achieved the process of translation and adaptation for three instruments present in the scholarly literature, meant to measure the investigated concepts - user experience, user satisfaction and usability.

User experience

For measuring user experience, we chose the validation instrument AttrakDiff 2.0 (Hassenzahl, Burmester, & Koller, 2003).

Usability

For measuring usability, the SUMI instrument was translated and adapted (HFRG 1994, MUSiC project).

User satisfaction

For evaluating user satisfaction, we translated and adapted the QUIS instrument (Questionnaire for User Interaction Satisfaction) (Chin, Diehl, & Norman, 1988).

Results

User experience evaluation

From evaluating the descriptive statistics we saw that the www.psychology.ro site is rather perceived as a site with hedonic features of identification, these representing the highest average.

Table 4.2. Reliability indicators for AttrakDiff scale.

Attrakdiff 2.0 dimensions	Cronbach's alpha Romanian sample group (N=152)	Cronbach's alpha (Hassenzahl, Burmester & Koller, 2001)	Cronbach's alpha (Hassenzahl, Kekez & Burmester, 2002) (N=46)	Cronbach's alpha (Hassenzahl, 2004) (N=33)
PQ	0,79	0,83-0,85	0,89	0,90
HQI	0,83	0,73-0,83	0,88	0,85
HQs	0,85	0,76-0,90	0,88	0,95
ATT	0,88	-	0,91	-

From the analysis of the results about reliability, we can state that the translated and adapted instrument has good validity indicators, close to values from other versions of the scales in German.

To check the configuration of the factors in the translated and adapted version of the scale, we resorted to a exploratory factorial analysis.

4 factors (Eigenvalue>1) were extracted from the analysis which altogether explain 60,54% of the total variation. Thus, the first factor appears to be saturated with items which evaluate the pragmatic qualities of technology (PQ) and is also the factor which explains the most part of the total variation (39,40%).

The second factor is saturated with items that evaluate the hedonic quality-stimulation (HQS) and explains 10,73% of the total variation. The third factor is saturated in items which evaluate identification as a hedonic quality (HQI) and explains 5,60% of the total variation.

QUIS

The analysis of averages shows that the general evaluations for www.psychology.ro site are around the average, the most positively perceived aspects being the ones related to the ease of learning to use the site (M=5,06, AS=1,18), while the most negatively perceived are the ones connected to the web page structure (M=3,72, AS=0,91). The second type of investigated indicators was Cronbach's alpha internal consistency indicators.

Table 5. Cronbach's alpha internal consistency indicators.

QUIS 5 Dimentions	Cronbach's alpha Romanian sample group (N=152)	Cronbach's alpha - Chin et al., 1988 (N=150)
General	0,87	0,93
Screen	0,78	0,933-0,939
Terminology	0,78	
Learning	0,81	
Abilities	0,80	

The results exhibit a good internal consistency for all subscales of the analysed instrument. An exploratory factorial analysis was the means to verify the configuration of factors for the translated and adapted version of the scale.

The next step was the analysis of data which resulted from the factorial analysis. 4 factors (Eigenvalue>1) were extracted. Altogether they explain 64,55% of the total variation.

Thus, the first factor appears saturated with items which belong to the content and structure of the web page. The second factor is saturated with items that evaluate the site's capacities/features. This factor explains 7,98% of the total variation of data. The third factor brings together items that measure the ease of site use learning and includes an item related to intuitive terminology and explains 6,76% of the total variation.

So we notice that out of the 4 dimensions of satisfaction evaluation, only 3 can be kept following the exploratory factorial analysis.

SUMI

The analysis of descriptive data shows that all 5 dimensions of the scale are situated around the averages reported by the initial authors (Porteous, Kirakowski, & Corbett, 1993). At the same time, the skew and arch indicators reflect normal distributions.

Table 8. SUMI scale reliability

SUMI dimensions	Cronbach's alpha Romanian sample group (N=152)	Cronbach's alpha Kirakowski, 1994 (N=143)	Cronbach's alpha Kirakowski, 1994 (N=1100)
effectiveness	0,81	0,77	0,81
help	0,87	0,80	0,83
affect	0,77	0,80	0,85
control	0,70	0,65	0,71
learning	0,83	0,77	0,82
general	0,91	0,90	0,92

The results indicate a good internal consistency for all the subscales of the analysed instrument.
Our values are similar to the values drawn from the studies of instrument development.

For the SUMI usability questionnaire, the adjustment indicators of data for the factorial analysis showed that these data, in their current structure, are not suitable for the factorial analysis due to the multicolineary aspect of the manifest variables. Running the exploratory factorial analysis even in these conditions led to extracting a factorial structure impossible to interpret, which does not come closer to the one suggested by the empirical contributions which support the development of the test (Kelly, 1994; Kirakowski, 1994). This situation raises question marks regarding the accuracy of the factorial analyses on which these contributions rely, never presented in detail, with all the data it entails. In its current form, the SUMI instrument appears to exhibit serious deficits in respect to construct validity. By comparison with the other two instruments, the latter presents the most serious issues in this respect, the reported subscales not being even partially present in the data structure.

Inter-scale correlations

The results (r between 0.39 ** and 0.91 **) reveal one more time the deficiencies of the construct validity reflected by reduced coefficients of discriminative validity. Again, although the scholarly literature reports low correlations between scales, our data show high and medium positive correlations, constant between most subscales of these instruments.

Discussion and conclusions

Overall, our data seem to align to the existing studies of the scholarly literature which give arguments to the persistence of some deficiencies in instruments validation and in methods of usability and user satisfaction measurement (Hornbaek, 2006; Gray & Salzman, 1998a, Gray & Salzman, 1998b, Hartson et al., 2000; Melone, 1990).

The investigation of the conceptual structure undelying the usability, user satisfaction and user experience concepts(Studiu 2B)

Although developed under different paradigms, both satisfaction and usability concepts seem to be based on the same psychological construction mechanism of the perceived product character (the cognitive schema that gathers the users' representations concerning the attributes of products) based on which, according to context and product, various cognitive (evaluation), emotional (pleasure, satisfaction) and behavioural (avoidance, approach) consequences are formed.

Starting with these observations, the hypothesis that are at the base of this study are the following:

H1: The empirical data obtained through the application of the AttrackDiff instrument validate the causal structure conveyed by the user experience model.

H2: The empirical data obtained through the application of the QUIS and SUMI instruments validate the causal structure conveyed by the user experience model.

H3a: In both cases of data sets, only the hedonic-identification attributes will make a significant contribution in explaining aesthetic evaluations.

H3b: All types of attributes will significantly contribute to explaining the utility evaluations, the pragmatic attributes weighing the most in the balance, in both cases of data sets.

Method

Participants

213 regular or master students of the Faculty of Psychology and Educational Sciences participated in the study and a number of 152 complete protocols were included in the analysis.

Instruments

The 3 instruments used were AttrakDiff 2.0 for measuring user experience (Hassenzahl, Burmester, & Koller, 2003), SUMI for evaluating usability (Kirakowski, 1994) and QUIS for evaluating user satisfaction (Chin, Diehl, & Norman, 1988).

Procedure

<u>The procedure of item selection</u>

The procedure of selecting the model for measuring the causal structure conveyed by the model of user experience through indicators of usability and user satisfaction instruments had at its foundation an approach based on experts.

<u>The procedure of testing the validity</u>

Our testing procedure consisted of two steps.

1. The evaluation of the validity of models through procedures of confirmational factorial analysis.
2. The evaluation of the predicted structural model.

Results

<u>The evaluation of the validity of models through procedures of confirmational factorial analysis</u>

Testing these initials models resulted in inadequate matching indicators.

Table 4. 10. Matching indicators for initial models.

Matching indicators	χ2	GFI	CFI	RMSEA	PCLOSE
Attrakdiff	140,638	0,884	0,924	0,077	0,014
	df= 74				
	p=.000				
Usability	142,184	0,851	0,847	0,082	0,000
Satisfaction	df=41				
	p=,000				

Because in certain cases (content overlapping, error resulting from the same measurement methods) it can be justified (Byrne, 2010), we resorted to specifying 2 correlations between errors for each of the two measurement methods.

Table 4. 11. The evaluation of the validity of models through procedures of confirmational factorial analysis.

Matching indicators	χ2	GFI	CFI	RMSEA	PCLOSE
Attrakdiff	121,641	0,901	0,944	0,062	0,582
	df= 72				
	p=.000				
Usability	88,441	0,909	0,924	0,068	0,489
Satisfaction	Df=38				
	p=,000				

The obtained indicators reveal an adequate matching of data, thus indicating the validity of measurement models specified in this second step.

<u>Evaluation of the structural model proposed</u>

Table 12. Matching indicators for testing the causal structure proposed with the help of two sets of data.

Matching indicators	$\chi 2$	GFI	CFI	RMSEA	ECVI
Attrakdiff	290,645	0,893	0,921	0,064	2,600
	Df=159				
	P=,000				
Usability	176,612	0,875	0,930	0,065	258,71
Satisfaction	Df= 95				
	P=,000				

Their analysis indicates an adequate fit of both sets of data on the tested structure, which leads to the validation of the first two hypotheses set for this study.

Table 4. 13. Unstandardised estimations. Regression coeficients (Structural Paths) for the AttrackDiff 2.0 instrument.

			Estimations	S.E.	C.R.	P
Attr	<---	HQI	.646	.122	5.280	***
Attr	<---	PQ	.108	.091	1.194	.232
Attr	<---	HQS	.053	.176	.301	.763
Good	<---	PQ	.522	.106	3.787	***
Good	<---	HQS	.403	.205	2.546	.011
Good	<---	HQI	.263	.113	2.329	.020

Table 4.14. Unstandardised estimations. Regression coeficients (Structural Paths) for the usability and satisfaction items 2.0.

			Estimations	S.E.	C.R.	P
Attr	<---	HQI	.596	.220	2.702	.007
Attr	<---	PQ	.090	.103	.872	.383
Attr	<---	HQS	.016	.178	.088	.930
Good	<---	PQ	.672	.128	5.236	***
Good	<---	HQS	.326	.117	2.788	.005
Good	<---	HQI	.197	.121	1.630	.103

In accordance with the predictions of the theoretical model, the product's attributes weigh differently when they explain the formation of some different general evaluations (Tables 4.13, 4.14).

Discussion and conclusions

The results of this study bring a major contribution to the theoretical clarification of some constructs intensely mentioned in the human-computer interaction field: usability, satisfaction and user experience. Although the relation between these concepts has been of intense interest in the scientific community of this field (see Bevan, 2008, Petrie & Bevan, 2009, Hornbaek, 2006, Hassenzahl 2004, Hassenzahl, 2008, Stewart, 2008) no solution has been presented for this dilemma.

The results reveal the fact that in classical forms of measurement, the concepts of usability and user satisfaction overlap conceptually with the user experience one. In conclusion there is a false differentiation between user satisfaction, usability and user experience. All these three constructs represent no more than stages and different factors which contribute with certain products to the building of user experience and can be integrated within the same psychological mechanism.

Chapter 5

The experience of the intranet technology user in organisational context. Investigation on the role of organisational culture.

Objectives

Starting with the aspects revealed so far, this study has two main objectives. First, we want to investigate the explanatory value of the user experience model in an organisational context by considering a type of interactive technology which supports and calls for both needs related to tasks and needs related to self, i.e. technology of intranet type. Furthermore, we want to investigate the role played by organisational culture in building the user's experience with the interactive technology in organisational context.

The second main objective is connected to investigating the way in which the user experience paradigm can be used in order to comprehend the results on the level of use behaviours supported by intranet technology. More specifically, we want to investigate the predictive value of the perceived traits in technology over the intranet use behaviours, both the ones supported by outer motivation (execution) and the ones supported by inner motivation (commitment, development, expansion). At the same time our goal is to test the moderating role of the cultural dimensions in the relation between perceived traits and intranet supported behaviours.

The verification of the explanatory power of the user experience in the organisational context. The impact of organisational culture (Study 3A).

H1. Hedonic-identification attributes will explain in most part the formation of evaluation in regards to intranet appeal.

H2. Pragmatic attributes together with the hedonic ones will explain the formation of general evaluation of utility (good), the most explanatory weight being that of the pragmatic attributes, followed by that of hedonic-identification attributes.

H3. Pragmatic attributes together with the hedonic ones will explain the formation of general evaluation of intranet quality, the most explanatory weight being that of the pragmatic attributes, followed by that of hedonic-identification attributes.

H4a. In a culture dominated by orientation towards people and the valorisation of social support, the weight of the hedonic traits in explaining the global evaluations of product quality, will be more substantial than that of the pragmatic traits. The hedonic-identification trait is the one that contributes most in explaining these evaluations.

H4b: In a culture dominated by orientation towards objectives and results, the weight of the pragmatic traits in explaining the global evaluations of product quality will be more substantial than that of the hedonic traits.

Method

Participants

84 employees from 2 organisations with different profiles took part in the study. Both organisations had implemented an intranet system used by the employees in their everyday activity.

Instruments

In order to measure the user experience, we chose the AttrakDiff 2.0 instrument (Hassenzahl, Burmester, & Koller, 2003). To measure the specific organisational culture, the FOCUS-93 questionnaire was used (De Cock, 1991; Muijen, Koopman, Dondeyne, De Cock, & DeWitte, 1992).

Results

From the results analysis one could observe that the largest weight in predicting evaluations of beauty is given by the hedonic-identification trait (β =0,485, t=6,14, p=0,000). The contribution of the other variables is also substantial, even if not as much.

In respect to explaining the formation of general evaluations on utility (good), the results show that the weight of the 3 variables are modified when it comes to prediction.

Thus, in this case, the largest weight in prediction belongs to pragmatic traits (β =0,498 t=5,62, p=0.000). At the same time the contribution of the hedonic-identification is important (β =0,236, t=2,480, p=0,015) while the one of the hedonic-stimulation becomes unimportant (β =0,132, t=1,37, p=0,172) thus confirming the second hypothesis of the study.

The last type of evaluation considered was the general evaluation of the intranet quality (Appeal). Here, all 3 types of perceived attributes (pragmatic, identification, stimulation) contribute significantly to the prediction of the global evaluation of intranet quality (hypothesis 3).

The impact of organisational cullture

Table 10. Culture A.

Model		**Independent variables**	**β**	**t**	**p**	**Semipartial correlations (control of remaining variables)**
Adjusted R2	0,383	**C. Pragmatic**	**0,430**	**3,53**	**0,001**	**0,418**
F (3,44)	9,09	C. Hedonic Identification	0,292	2,35	0,023	0,279
p	0,000	C. Hedonic Stimulation	0,303	2,47	0,017	0,293

- Dependant variable: general evaluation of intranet quality

Table 10. Culture B

Model		**Independent variables**	**β**	**t**	**p**	**Semipartial correlations (control of remaining variables)**
Adjusted R2	0,706	C. Pragmatic	0,332	3,36	0,002	0,323
F (3,32)	25,58	**C. Hedonic Identification**	**0,591**	**5,41**	**0,000**	**0,520**
p	0,000	C. Hedonic Stimulation	0,195	1,80	0,081	0,173

- Dependant variable: general evaluation of intranet quality

Table 11. Models of multilinear explanatory regression for the dependent variable – Beauty , for cultures A and B.

Model		Independent variables	β	t	p	Semipartial correlations (control of remaining variables)
R2	A=,588	C. Pragmatic	0,343	3,45	0,001	0,334
	B=,496		0,285	2,21	0,034	0,278
F (3;44)	A=20,91	**C. Hedonic Identification**	**0,358**	**4,52**	**0,000**	**0,438**
F (3;32)	B=10,47		**0,552**	**3,86**	**0,001**	**0,485**
P	A=0,000	C. Hedonic Stimulation	0,444	4,43	0,000	0,429
	B=0,000		0,065	0,46	0,649	0,058

So we notice again that for the two companies the contribution of hedonic traits to the prediction of beauty evaluations is modified. For company A, the contribution of hedonic-stimulation traits is a significant one, while for company B the contribution is insignificant.

In respects to the utility (good) evaluation, the regression model for company A has highlighted the fact that the highest predictive value comes from the pragmatic traits followed by hedonic-stimulation traits, and the identification variable brings an insignificant contribution.

The regression model for company B highlighted the fact that the highest predictive value is brought in by the hedonic-identification traits, followed by pragmatic traits, while hedonic-stimulation traits have a insignificant contribution to the prediction (Table 12).

Table 12. Models of multilinear explanatory regression for the dependent variable – Good , for cultures A and B.

Model		Independent variables	β	t	p	Semipartial correlations (control of remaining variables)
R2	A=,482	C. Pragmatic	**0,632**	**5,67**	**0,000**	**0,493**
	B=,374		0,344	2,39	0,023	0,335
F (3;44)	A=13,66	C. Hedonic Identification	-0,082	-0,72	0,471	-0,147
F (3;32)	B=6,36		**0,469**	**2,94**	**0,006**	**0,413**
P	A=0,000	C. Hedonic Stimulation	0,197	1,75	0,086	0,297
	B=0,002		-0,69	-0,436	0,666	-0,061

None of these moderation relations was empirically supported moderation in our group sample. On the other hand, a direct relationship could be highlighted: when the perceived traits effect is controlled ($\Delta R2 = 0.024$, Fchange = 5.06, $p = 0.027$), the individual contribution of the support variable to the global evaluation prediction is statistically significant ($r_{sp} = 0.155$).

Discussion and conclusions

The results of this study reveal the fact that the user experience model is a model which works and allows for predictions regarding the way in which cognitive evaluations regarding technology are formed, even when the considered environment is an organisational one, which tends to relate rather with tasks and fulfilling these, and less with the pleasure of use and other hedonic results more frequently associated with this model (Monk & Frohlich, 1999; Draper, 1999, Glass, 1997, Jordan, 2000, Hassenzahl, 2002; 2003; 2004; 2008, Gaver & Martin, 2000).

Regarding the role of organizational culture, we could only reveal changes in the explanatory power of the traits perceived in the two companies where different dimensions of the organizational culture are predominantly valorified. These differences, however, cannot be directly associated with certain dimensions of organizational culture; other intra-organizational factors, such as the practice of using the intranet or the different functions of the intranet in the two organizations, could be related to these changes.

A model of user experience in work environment focused on behavioural resultants. The role of organisational culture.

Although situated among the consequences side of the user experience model, so far the relation between their behaviours with the perceived qualities of the product has not been investigated, only the relation to consequences on a cognitive level has been emphasised (Harbich & Hassenzahl, 2008; Harbich, Hassenzahl, & Kinzel, 2007). The main objective of the study is to investigate this relation. A second objective is to verify the permanence of the relations between the behavioural consequences and cognitive ones, and also to investigate the relations between the perceived traits of the product and the behavioural resultants.

Method

Participants

84 employees from 2 organisations different in profile took part in the study. Both organisations implemented an intranet system built on a Microsoft Sharepoint platform, which the employees use in their everyday activities.

Instruments

We used two instruments of measuring user experience (AttrakDiff 2.0 - Hassenzahl, Burmester, & Koller, 2003) and the organisational culture specific to the organisations participating in the study (FOCUS 93 - De Cock, 1991; Muijen, et al., 1992). These were used for study 3A. Instrument e4 was added (Harbich, Hassenzahl, & Kinzel, 2007) in order to measure the behavioural resultants of the user experience in interactive technology in an organisational environment.

Results

The first step in our analysis is verifying the quality in the Romanian translation of the E4 instrument. Based on the analysis 5 factors were extracted (Eigenvalue>1); they explain together 71% of the total variation. The results, with the exception of item 5 which is a separate factor in itself, are identical with the ones from the original scale.

In the same sense of verifying construct validity of the instrument we also analyzed the inter-dimensions correlations. The results indicate that the dimension connected to solving execution tasks does not correlate with any of the other dimensions of the scales, and the commitment dimension correlated with both hedonic dimensions: development and expansion. Correlations, although significant, are moderate, and even more reduced than those obtained by the authors of the scale.

The Cronbach's alpha internal consistency indicators have shown a good reliability of the instrument e4 scales, being comparable with the ones obtained by the authors of the scale.

In order to verify the first hypothesis of the study we used an analysis of multilinear hierarchical regression. Its results can be analysed in table 7.

Table 7. The results of the multilinear regression analysis on the dependant variable – Good.

Model			**Independent variables**	**β**	**t**	**p**	**Semi partial correlations (control of remaining variables)**
1	R2	0,201	Execution	0,418	4,80	0,000	
	F (1,82)	17,36					
	P	0,000					
2	ΔR2	0,184***	Execution	0,468	4,80	0,000	0,433
	F (4,79)	11,02	Expansion	0,105	1,05	0,295	0,095
	p	0,000	Commitment	0,429	4,14	0,000	0,374
			Development	-0,167	-1,59	0,114	-0,144

- Dependant variable: Good

Based on the analysis of the presented data we see that utility assessments are mostly explained by facilitating execution behavior, but adding hedonic behaviors to this adds a significant boost in prediction, due to the commitment variable which is the only one of these three types of behaviors related to self which significantly explains this type of evaluation; the explanatory power is even close to that of solving type behaviors. But when we take into account the assessment of the desirable-motivational trait of the intranet, we can see that when introducing the hedonic behaviors in the regression model, the significant contribution in the first model of the execution variable now becomes insignificant, while hedonic behaviors contributions all become significant.

Table 8. The results of the multilinear regression analysis on the dependant variable – Motivational

Model			**Independent variables**	**β**	**t**	**p**	**Semi partial correlations (control of remaining variables)**
1	R2	0,054	Execution	0,232	2,15	0,034	
	F (1,82)	4,06					
	P	0,034					
2	ΔR^2	0,261***	Execution	0,086	0,82	0,397	0,079
	F (4,79)	9,06	Expansion	-0,237	-2,31	0,023	-0,215
	p	0,000	Commitment	0,359	3,35	0,001	0,313
			Development	0,305	2,82	0,006	0,263

For explaining each category of behaviors based on the perceived technology traits we resorted also to the multilinear regression analysis. We also investigated the explanatory power of the cultural dimensions over technology use behaviors. The results are shown in the table below.

Table 9. The results of multilinear regression analysis for predicting behaviours based on the perceived product traits and based on cultural dimensions.

Dependent variables			**Independent variables**	**β**	**t**	**p**	**Semi partial correlations (control of remaining variables)**
Execution 1	R2	0,168	C. Pragmatic	0,152	1,46	0,146	0,150
	F (3,80)	5,40	C.H. Identification	-0,026	-0,23	0,815	-0,024
	P	0,002	C.H. Stimulation	0,369	3,30	0,001	0,337
Execution 2	ΔR2	0,052**	C. Pragmatic	0,068	0,63	0,527	0,063
	F (4,79)	5,59	C.H. Identification	-0,72	-0,65	0,515	-0,065
	P	0,001	C.H. Stimulation	0,381	3,50	0,001	0,348
			INNOVATION	0,248	2,30	0,024	0,229
Commitment	R2	0,204	C. Pragmatic	0,218	2,16	0,034	0,215
	F (3,80)	6,82	C.H. Identification	0,365	3,35	0,001	0,335
	P	0,000	C.H. Stimulation	0,019	0,17	0,866	0,017
Commitment	ΔR2	0,194**	C. Pragmatic	0,209	2,08	0,041	0,190
	F (5,78)	7,90	C.H. Identification	0,244	2,34	0,021	0,214
	P	0,000	C.H. Stimulation	0,034	0,34	0,735	0,031
			SUPPORT	0,393	3,91	0,000	0,357
			RULES	-0,226	2,28	0,025	-0,208
Development	R2	0,204	Experience	0,267	2,54	0,013	0,264
	F (4,78)n	4,75	C. Pragmatic	0,017	0,15	0,874	0,017
	P	0,002	C.H. Identification	0,373	3,34	0,001	0,346
			C.H. Stimulation	-0,039	-0,34	0,731	-0,036
Development	ΔR2	0,113**	Experience	0,148	1,42	0,158	0,138
	F (5,77)n	6,70	C. Pragmatic	-0,091	-0,87	0,383	-0,085
	P	0,000	C.H. Identification	0,253	2,30	0,024	0,223
			C.H. Stimulation	-0,003	-0,02	0,977	-0,003
			OBJECTIVES	0,391	3,47	0,001	0,336
Expansion 1	Insignificant		C. Pragmatic				
			C.H. Identification				
			C.H. Stimulation				
Expansion 2	R2	0,186					
	F (2,82)	3,84	INNOVATION	0,296	1,82	0,071	0,193
	P	0,025	OBJECTIVES	0,445	2,74	0,007	0,290

Results analysis shows that, contrary to the formed hypothesis number 2, the execution behaviours within our group sample are best explained by hedonic-stimulation traits.

In what the commitment behaviours are concerned, the results confirm hypothesis 3a, revealing the fact that the hedonic-identification traits contribute the most in explaining the emergence of this behaviour.

In accordance with the *Job Resources Job Demands* model (Bakker & Demeroutti, 2008), an antecedent of commitment was accounted for by social support at work. Thus, the orientation toward support and rules contribute to explaining commitment, innovation contributes to explaining execution and expansion, and the orientation towards objectives contributes to explaining development and work expansion behaviors. We can say that hypothesis 5 is partially confirmed, while the specific effect of each cultural variable over the technology use behaviours would require further investigations.

The results for testing the 4th hypothesis led to its rejection. Thus, by performing multilinear hierarchical regressions on the four behavioral resultants, a significant increase of the weight of identification trait in explaining the behaviors could not be revealed, as it was observed in the first study.

Conclusions

This study joins recent efforts, however small in number, to address the issue of technology user experience in an organizational environment, and especially those focused on studying the consequences of user experience regarding technology supported behaviours (Harbich et al., 2007, Harbich & Hassenzahl, 2008). Our efforts have not only converged with the existing ones by successfully adapting and using the instruments proposed by the user experience in the organizational environment paradigm, but also by addressing certain relations which had not been tested in previous works.

Chapter 6

Final conclusions

The studies presented here served several purposes meant to push forward the research and understanding of psychological phenomena associated with the implementation and use of interactive technologies in various contexts, with focus on using them in organisational context. Our work incorporated two preliminary studies and three other, the last two, in turn, being made out of two related research approaches.

Contributions of the conducted studies

Summarizing the results of conducted studies of this paper, we can summarize the contributions of this work, both on the general area of human-computer interaction, and also on the more specifically area of investigating user experience on intranet technology in an organizational context.

Table 6.1. Study contributions on a theoretical, empirical and practical level.

LEVEL	Type	A summary of the contributions of the 5 studies conducted here
THEORETI	Critical analysis of	-Testing the conceptual models and the models of measurement of the three core

CAL	the used constructs	constructs for the study of the perception of quality in interaction with technology -Highlighting the tradition of concepts crystallization starting with measurement models
	Constructs integration	-Differentiating and defining user satisfaction and usability constructs -Using the conceptual framework of user experience model to integrate these constructs -Empirical testing to confirm the proposed integrative solution
	Development of the user experience model	-Investigating the role organisational culture dimensions as contextual factors, while the only contextual factors investigated so far are the ones connected to use situations (directed towards goal vs. activity). -Extending the model specifications to the level of behavioural results by operationalisation of use behaviours in the light of their motivational value.
EMPIRICAL	Empirical support for the theoretical analysis of the HCI field	-The study of research trends in the HCI field in Romania (study 1) is the first one of its kind in the HCI scientific community in the country and one of the few systematic studies conducted internationally.
	Testing of measurement instruments for experience, satisfaction	-Study 2A provides proofs regarding the unsuitability of some well known scales for the measuring of usability and user experience -Study 2A provides data which supports the adaptation of the instrument of user experience evaluation with little modifications on some items -Study 3A supports the adaptation of the instrument of user experience evaluation even when the context is organisational and the interactive technology is of intranet type
	Testing of the user experience model	- Study 2B is the first study which tests the causal structure of the user experience model with the help of shaping into structural equations; so far testing has been done only with the help of regression models -Study 2B provides data which support the validity of the causal structure described by the user experience model even when measurements from instruments of user satisfaction and usability are being used -Study 3A provides data which support the adaptation of the user experience model also in an organisational context, taking into consideration the intranet type of technology, a context and a type of technology that have not been investigated before inside this model. -Study 3B investigates the adaptation of the user experience model when the considered results are use behaviours, an aspect which was not tested before -Studies 3A and 3B investigate the role of cultural dimensions in explaining evaluations and behaviours supported by technology and provide data which support a direct effect of these variables, and not a moderating effect, especially over behavioural results
PRACTICAL	Adaptation of 4 instruments in Romanian	-Studies 2A and 2B can formulate recommendations in regards to using certain instruments in practice (Attrackdiff 2.0 and QUIS) or in regards to the unsuitability of other instruments for their use in practice (SUMI) -Study 3A confirms the adaptation of AttrackDiff 2.0 instrument also in an organisational context in relation to intranet technology -Study 3A confirms the adaptation of e4 instrument of evaluating the behaviours supported by technology in organisational context
	Support for the necessity of considering hedonic qualities in the formation of evaluations and behaviours supported by intranet	-Studies 3A and 3B show that even when the center of interest is a technology of support for organizational processes, hedonic characters are significant predictors of evaluations but also of work behaviour technologically supported. Therefore, design and implementation efforts should aim at technology features which meet the needs of employees beyond simply solving tasks, such as the need for networking / identification or the need for self development/ stimulation.
	Support for the necessity of considering elements of organisational culture in consideration of a successful implementation	-Studies 3Aand 3B highlight the explanatory power of the organisational culture dimensions, especially in regards to the results on a behavioural level. -Use behaviours: behaviours that go beyond the simple execution of the task (such as commitment, development and expansion) are heavily influenced also by the type of organisational culture, and the contribution of the perceived attributes of technology is more reduced. -When it comes to processes of intranet implementation, the companies should pay attention also to the elements of the organisational culture which can support certain use behaviours to a greater extent than the perceived attributes of technology (e.g. commitment behaviours supported by technology).

Aside from the contributions highlighted in the previous sections, it is important to also mention the limits that restrict the general dimension of the results. Beyond these limits, however, and the need to go deeper with the research of certain aspects related with the used model and the particular context and technology under study, we are convinced that our research represent and evolution in this field, both from the perspective of the results which support the importance of the holistic consideration of the use experience, even when the context is organisational and the technology has the main purpose supporting organisational processes and operational tasks completion.

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