Preface

It is not possible to imagine our lives today without technology. From the moment we get up in the morning till we go to bed again at night, technology is present in almost every moment, even if we are not aware of it. Also, some of the tasks / activities we need to perform regularly, could not be carried out without technology. For instance, booking a ticket for the train, flight or even a concert, making bank transfers, communicating or interacting with other people, buying books, music or even clothes, looking for information regarding certain symptoms or disease, paying at any store any kind of product, consuming information, searching for news, driving a car, using a mobile phone, just to mention a few. We are already so used to technology that we do not even think about it, about its presence, impact, problems and aspects in the relationship between the technology and humans. Aware of that fact, in this book we decided to bring to the discussion two particular aspects of technology and human interaction: socio-logical and philosophical aspects.

When we read about technology and information systems, we always hear how good and nice they are and how they can change our lives always towards a positive way. However, we forget that technologies and information systems, in order to be useful, must be used in the correct way, knowing how to make the most profit of it. This means that if people are not prepared (or well prepared) for this situation, technologies will be useless. Furthermore, we also need to think about the relationship that is established between the user and technology. This relationship must be established taking into consideration that technology needs to be user-friendly, intuitive, have the correct design (means that the designer must have a good understanding of how humans learn and work with computers including envisioning new modes of work), and meet the expectations of the user, just to mention a few issues. Also need to say that these relationships can be more complex than expected since human behavior is greatly influenced and governed by social, religious, cultural and legal guidelines.

Aware of the importance of the interactions between human and technology, papers are dealing with aspects related with trust, communication, data protection, usability concerning organizational change and e-learning as well as the importance of voices of users. Furthermore, and as we believe that models, frameworks, theories also help the scientific field of human and computer interaction to advance, we selected a set of researches that present and discuss precisely philosophical aspects related, for instance, with the open access to networks, the risk of surveillance in the internet and the strategies that can be (or are) developed to avoid them, the development of models for technology adoption, the evaluation of systems and the measurement of expectations and behaviors of users just to name a few. The book ends with the presentation of two examples of the application of technology in innovative fields.

This book was designed either for practitioners and academic professionals. Papers present a nice blend of conceptual, theoretical and applied researches. Furthermore, I sincerely hope that the examples presented in this book will stimulate further research in technology and human interaction and related
topics. It is also my wish that this book will serve as a valuable source of inspiration for managers and researchers concerned about human and computer interaction.

**Section 1: Sociological**

The first two chapters deal with trust. Chapter 1, *Involvement, Elaboration and the Sources of Online Trust* by Russell Williams and Philip Kitchen acknowledges that establishing trust in online encounters has attracted significant recent research interest. The authors discuss that factors related to trust can be manipulated on a website to influence consumers’ trusting beliefs. A notable part of the research concerns the influence of website infrastructure and attributes on consumers’ assessment of vendor trustworthiness in the absence of knowledge-based transactional experience. The authors develop their work and introduce marketing concepts of ‘involvement’ and ‘elaboration’. In the context of this research, consumer involvement describes the relevance of a situation or decision for an individual and the importance of this concept lies in the fact that it influences an individual’s information search and processing strategies. Having this in mind, authors suggest that the infrastructure and attributes that individuals use as informational cues may in fact influence assessments of trusting beliefs differently, according to whether individuals face high or low involvement situations.

Chapter 2, *Defining Trust and E-Trust: From Old Theories to New Problems* by Mariarosaria Taddeo, provides a selective analysis of the main theories of trust and e-trust advanced in the last twenty years, in order to prepare the ground for a new philosophical approach to solve the problems facing them. The chapter is divided into two parts: 1) the author analyses e-trust - she focuses on trust and its definition and foundation and describes the general background on which the analysis of e-trust rests; 2) the author discusses e-trust, its foundation and ethical implications. At the end a synthesis of the analysis of the two parts is provided.

After trust, there are another two chapters discussing communication. Chapter 3, *Using the Social Web Environment for Pattern Engineering* by Pankaj Kamthan, aims to address the communication requirements of the elements of pattern engineering (namely, actors, activities, and artifacts) in general and the pattern realization process in particular. In order to attain this objective, a theoretical framework using the Social Web as the medium is proposed and its implications are explored. The prospects of using the Social Web are analyzed by means of practical scenarios and concrete examples. The concerns of using the Social Web related to costs, decentralization and distribution of control, and semiotic quality of representations of patterns are highlighted. The directions for future research including the use of patterns for Social Web applications, and the potential of the confluence of the Social Web and the Semantic Web for communicating the elements of pattern engineering are also briefly explored.

Chapter 4, *Organizational Communication: Assessment of Videoconferencing as a Medium for Meetings in the Workplace* by Bolanle Olaniran explores and presents an account of videoconferencing use in a governmental organization and addresses implications for meetings and general communication process. It is possible to find in the literature significant research focusing on e-mail, face-to-face (FTF), and other asynchronous mediated communication as the communication media of choice within organizations. However, modern organizations have alternative tools at their disposal such as videoconferencing which is now an affordable medium of choice because it precludes travel and is accessible on demand. As such research is needed on order to study the impact of its use in organizations.

Usability is the third issue discussed under the topic of sociological aspects of technology and human interaction. Chapter 5, *User-Centered Systems Design as Organizational Change: A Longitudinal Action*
Research Project to Improve Usability and the Computerized Work Environment in a Public Authority by Jan Gulliksen, Åsa Cajander, Bengt Sandblad, Elina Eriksson and Iordanis Kavathatzopoulos, presents a longitudinal case study in which six Human-Computer Interaction (HCI) researchers worked extensively in an action research cooperation with a public authority over a period of four years. The purpose of the cooperation was to increase the focus on usability in the authority, and the main research question was how do users introduce usability and user centered systems design issues into a public authority? Authors adopt and approach of action research and the data used in this paper is derived from an evaluation performed at the end of the project, as well as through the experiences of the authors from working with the project. The results involve aspects related to organizational issues, management support, strategic documents and end-user participation. Moreover the results include methodological support for bringing users and developers closer together and individual and organizational attitudes to development. The aim of this paper is to make some general conclusions on how to bring about change when approaching a large public authority with the purpose of introducing usability and user centered systems design.

Chapter 6, Usability in the Context of E-Learning: A Framework Augmenting ‘Traditional’ Usability Constructs with Instructional Design and Motivation to Learn by Panagiotis Zaharias, presents a framework in the context of e-learning. The topic of e-learning quality remains important in the end users’ (the learners’) agenda. It is no surprise that many non-motivated adult learners abandon prematurely their e-learning experiences. This is attributed in a great extent to the poor design and usability of e-learning applications. This paper proposes a usability framework that addresses the user as a learner and extends the current e-learning usability practice by focusing on the affective dimension of learning, a frequently neglected issue in e-learning developments. Motivation to learn, a dominant affective factor related with learning effectiveness, has been similarly neglected. Usability and instructional design constructs as well as Keller’s ARCS Model are being employed within the framework proposed in this work upon which new usability evaluation methods can be based. This framework integrates web usability and instructional design parameters and proposes motivation to learn as a new type of usability dimension in designing and evaluating e-learning applications.

The last five chapters of the Section 1 deal with privacy and data protection, the need to listen to users in the field of software development and the use of storytelling in location.

Chapter 7, Humans and Emerging RFID Systems: Evaluating Data Protection Law on the User Scenario Basis by Olli Pitkänen and Marketta Niemelä, discusses some aspects related to Radio Frequency Identification (RFID) technology. As a matter of fact, RFID offers a lot of promises and in order to redeem them, RFID applications have to respect privacy and need to be supported by the legal system. The article evaluates how the current EU directives on data protection support emerging applications that are based on RFID tags using user scenarios that illustrate human needs in relation to technologies and applications. The article builds on earlier analyses and uses more realistic and state-of-the-art applications and scenarios. It concludes by pointing out further research needs in the field of RFID and data protection.

Chapter 8, ‘Listening to the Voices of the Users’ in Product Based Software Development by Netta Iivari and Tonja Molin-Juustila, critically examines the practice of ‘listening to the voices of the users’ in particular how it is accomplished in product based software development. First literature addressing users’ role in the product development context is reviewed. Afterwards, empirical analysis in three IT companies involved in product business but with different degrees of productization is carried out. In the analysis, the focus is on: 1) Where do the users’ voices come from? 2) When are the users’ voices listened to? 3) What happens to the users’ voices; whether and how do they affect the development? 4) What are the challenges and particularities of each case? Results show similarities but also clear differences between the cases. Finally, implications both for theory and practice are discussed.
Chapter 9, *Location-Based Mobile Storytelling* by Jennifer Stein, Scott Ruston and Scott Fisher, describe a research in location-based mobile storytelling entitled Tracking Agama. Using a combination of SMS messaging, voice calls, and web log entries, Tracking Agama leads its participants, through a narrative-based exploration of Los Angeles, in the pursuit of a fabled urban researcher: “Agama.” Participants act like a detective in order to discover the keywords allowing access to Agama’s voice-activated and phone-accessible audio diary entries; they also send and receive SMS messages from Agama and his assistant and receive calls from the virtual characters.

**Section 2: Philosophical Aspects**

Chapter 10, *The Case for Open Access Networks* by Don Flournoy, Rolland LeBrasseur and Sylvie Albert discusses the importance of keeping the access to the networks opened. To set the stage, authors start by examining some of the publicly stated arguments and positions being taken in the articulation of “net neutrality” and “open source” practices and principles. Then, they explore the difficult technical challenges present in maintaining “open access” telecommunications networks using proprietary technologies. Incentives to work together to adopt universal technical standards are also discussed. It is also argued that with more open technical standards, open source applications and products can be accelerated and made more pervasive. In this context, collaboration among businesses, national governments and public sectors is seen as a key issue to implement policies that lead to public participation in economic and social development, both locally and globally. The authors conclude that the principal means by which all these approaches can be sustained is to keep the Internet accessible, free and open for all.

Chapter 11, *Counter-Surveillance Strategies Adopted by Child Pornographers* by Marie Eneman discusses how ICT in combination with technological advances facilitates the downloading, distribution and exchange of child abusive material. One can argue that ICT provide a perceived anonymity for people downloading and distributing child abusive material (child pornography). Furthermore, technology offers powerful surveillance mechanisms to monitor these activities and thus constitutes a powerful tool for law enforcement. This article aims to explore how offenders manage the risk of surveillance when downloading, distributing and exchanging child abusive material. Critical research with a focus on panopticon is used as a theoretical framework. The data is drawn from interviews with offenders, convicted of child pornography. The findings show that a new theoretical concept better adjusted to surveillance practices that allow the many to watch the many is needed since offenders claim having developed technological and social strategies to reduce the risk of surveillance.

Chapter 12, *A Multi-Facet Analysis of Factors Affecting the Adoption of Multimedia Messaging Service (MMS)* by Judy Lin and Chin-Lung Hsu, introduces a multi facet model for MMS adoption. Mobile applications such as multimedia messaging service (MMS) promise a new way to share rich content of information that enhances its users’ personal connectivity experiences as well as productivity. However, the adoption of MMS seems to be unexpectedly slow. As mobile phones become ever smarter (or complex) in functions, understanding the adoption behaviors of complex mobile services such as MMS turns to be important to both practitioners and academic. This paper introduces a model for MMS adoption by integrating the well-known behavioral models such as Theory Acceptance Model and Theory of Planned Behavior with other factors including intrinsic motivation, personal innovativeness and critical mass. An internet survey of 213 subjects with prior experience in MMS usage found strong support for the proposed model. The results show that the adopter’s attitude toward MMS is the most dominating factor in shaping his/her intention to use MMS, followed by subjective norm and perceived
behavioral control. Moreover, the results further suggest adopter’s intrinsic motivation is the most important motivating factor for attitude toward using MMS. Implications of these findings are discussed both for researchers and practitioners.

Chapter 13, *The Benefits of (Automated) Dialogue* by Robert Hurling, Marco De Boni and Alannah Richardson, compares user evaluation of an automated text based dialogue system with a simple pick list for the same task. The authors matched the systems in terms of key factors, such as design for Usability, and took into account individual differences between participants that might have influenced their perception, such as Locus of Control, Experience and Personality. They found participants rated the text based dialogue system as being more informative, more credible, less frustrating and more persuasive than the simple pick list system. Participants’ ratings were dependent on their Personality, Locus of Control and reported level of physical activity. Participants did not differentiate between the systems in terms of their ease of use, indicating that the other observed differences were not due to a simple difference in Usability. This study demonstrated the benefits of including automated dialogue in a system designed to help people find solutions for their exercise barriers. Further work is required to establish in what other situations dialogue provides a benefit.

Chapter 14, *On User Experience Measurement Needs: Case Nokia* by Pekka Ketola and Virpi Roto discusses the importance of measurements related to user expectations, behaviors and experiences and how they can provide useful data to many roles and teams in a company. Each role provides different views to the question “what should be measured, and why?”. The authors conducted an empirical study on user experience (UX) measurement needs at different units and levels in one corporate – Nokia - and asked which kinds of UX measurements would be useful for different functions. The authors identified common UX measurement needs on 8 different themes.

**Section 3: The Case of Design in Technology, Concept and Learning**

Chapter 15, *A Motive Analysis as a First Step in Designing Technology for the use of Intuition in Criminal Investigation* by Ingerid Rodseth, deals with intuitive feelings and its role in crime solving. Author alerts to the fact that there are no technological tools targeting directly on mediating this investigation factor and so a technology that encourages the sharing and alerting of hunches seemed to be needed. A motive analysis of interviews with criminal investigators was performed as part of an investigation aiming at adding hunches to the criminal investigators’ visualization tools. The purpose of the study was to explore how a motive analysis (by revealing the criminal investigators’ motives and attitudes) could contribute in the first phase of the design. Based on the results a technological concept for using intuition in criminal investigation is proposed.

Chapter 16, *Designing Ubiquitous Content for Daily Lifestyle* by Masa Inakage, Atsuro Ueki, Satoru Tokuhisa and Yuichiro Katsumoto, presents a design theory for an emerging genre in digital content called Ubiquitous Contents (contents for living people, those which link closely with daily life). The article introduces the design concept using examples to illustrate how people, artifacts and environment can be seamlessly connected to create emotional and entertaining experiences through the interaction.

Chapter 17, *Asymmetrical Learning Create and Sustain Users’ Drive to Innovate, When Involved in Information Systems Design* by Anne Kanstrup and Ellen Christiansen, positions user-driven innovation vis-a-vis participatory design and Scandinavian systems by identifying the defining characteristics of user-drive as the relationship between power over interaction, and learning in interaction. A case of design of feedback on electricity consumption for private households based on user-driven innovation serves
to exemplify core principles of user involvement and user engagement. Taking into consideration what is meant by being innovative, authors explain how letting users take the innovative lead can contribute to a positive outcome, and how the approach to user-driven innovation can be regarded as a way to combine classic Scandinavian values of democracy with new economy calls for innovation in systems design. The article stresses the importance of designers taking a genuine interest in learning from users while also giving users the opportunity to learn about design.

**Section 4: Application of Technologies in Specific Fields**

Finally, in Section 4, two cases of application of technologies in two different situations are presented and discussed. Chapter 18, *Internet-Enabled User Interfaces for Distance Learning* by We Liu, Keng The, Roshan Peiris, Yongsoon Choi, Adrian Cheok, Charissa Mei-Ling, Yin-Leng Theng, Ta Nguyen, Tran Qui and Athanasios Vasilakos discusses how to use two main media in distance learning: multi-modal Internet technologies, namely remote physical interface and remote augmented reality technology in distance learning. The advent of Internet technologies has since decades ago propelled distance learning drastically. In this modern world, knowledge develops so fast that the amount of intellectual information that needs to be learnt before is huge and becomes obsolete quickly. Distance learning through the use of Internet technologies has the advantage of being able to get across the information to the students remotely and effortlessly. The other advantage is that students are able to learn from their instructors on an entirely new media platform - the Internet-enabled and tangible user interface.

Chapter 19, *In-Vehicle Avatars to Elicit Social Response and Change Driving Behavior* by Andry Rakotonirainy, Frank Feller and Narelle Haworth, presents the use of avatars to teach people how to drive a car expressing appropriate social interactions between drivers and avoiding aggression, selfishness driving and anti-social behavior. It is known that personal characteristics and the driving situations play strong roles in driver’s aggression. The approach presented is centered around the driving situation as opposed to focusing on personality characteristics. It examines aggression and manipulates contextual variables such as driver’s eye contact exchanges. It presents a new unobtrusive in-vehicle system that aims at communicating drivers’ intentions, elicit social responses and increasing mutual awareness. It uses eye gaze as a social cue to affect collective decision making with the view to contribute to safe driving. The authors used a driving simulator to design a case control experiment in which eye gaze movements are conveyed with an avatar. Participants were asked to drive through different types of intersections. An avatar representing the head of the other driver was displayed and driver behavior was analyzed. Significant eye gaze pattern difference was observed when an avatar was displayed. Drivers cautiously refer to the avatar when information is required on the intention of others (e.g. when they do not have the right of way). The majority of participants reported the perception of “being looked at”. The number of glances and time spent gazing at the avatar did not indicate an unsafe distraction by standards of in-vehicle device ergonomic design. Avatars were visually consulted primarily in less demanding driving situations, which underlines their non-distractive nature.

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