

Preface

CONCEPTUALIZING INNOVATIONS, METHODS, AND ETHICAL ISSUES

It is reasonable to assume that modern media have an impact on societal structures. A variety of technologies penetrates individual spheres of life and affect collaborative processes between people. A typical phenomenon stemming from the spread of Web-based media is a shift in people's modes of communication. As a result, the use of digital information and communication technologies (ICT) has become prominent in business, in education, and in administration. However, it is far from obvious that the technology will change the way organizations teach and individuals learn. The reason is that politicians, employees, management, and students are confined to rather closed environments, limiting interfaces and narrow patterns of communication.

INTRODUCTION

The once over-enthusiastic vision of whole populations communicating via expert systems has failed to materialize. For quite some time now, this failure to meet early expectations on ICT has overshadowed the prospects of wide and flexible access to innovation, methodology and ethics that the current e-learning community is developing. Many organisations, schools, and enterprises are bringing digital information technologies into the mainstream of their information systems, thus forming an integral part of an on- and offline contents oriented coursework. The early enthusiasm originally embodied an idea of growth through the media. This ideal still prevails, but how do people value new socio-technical systems, and how do they apply different solutions?

Communication, interaction, and mediation of meaning form a multi-faceted process that is hard to analyse in simple terms. It is a fact of life that people, interaction, and mediation are related to societal development. Continuous development of physical, visual, and linguistic resources forms a most effective tool for cultural growth. If applied to social systems they contribute to the sustainability of emerging, developing, and shared knowledge and skills. It is worth noticing, however, that in spite of the emerging technology, face-to-face interaction still makes up the most crucial mechanism for mediation of information, intentions, and aspirations. Any conversation between any people at any time is enabled by mediation. Through higher mental functions like memory, reflection, and speech, people provide endless resources for shared communication. An oral description of an event, an e-mail question, a sympathetic nod of the

head or wink of the eye mediates descriptions, ideas, opinions, and aspirations so exclusively that the oral mode facilitates for the interlocutor to learn about Self, Other and the world in one and the same process. One interlocutor's way of thinking, negotiating, and reasoning can easily be adopted, copied, acquired, or appropriated by another interlocutor. For example, when a computer reacts differently than expected, a helpful colleague may intervene and suggest some appropriate measures. Furthermore, mediation is brought about in many kinds of virtual and situated communities of practice, primarily through adapted application of language games, verbal procedures, and technical instrumentation.

Hence, digital information technologies presuppose the existence of a mediating artifact that facilitates our understanding of the world. As such, mediating artifacts like languages, teambuilding interactions, or computing machines verify to the contention that mediation is a precondition for the development of higher psychological functions in the human race. The very same mediating function reappears when modern man operates a screwdriver, a car, or a digital information system. The functions that first appear in a child's unique and lifelong perspective are a carbon copy of what happens when adults interact with the help of pre-designed technologies and social systems. Mediation of meaning(s) is an old phenomenon for human growth, but a lot remains before we can say that the full potential of mediating artifacts has been reached. This book indicates one way to approach the ongoing evolution of instrumentally and socially mediated human exchanges.

HOLISTIC UNITY VS. FRAGMENTED ATOMISM

The focus of this handbook is on communication in the widest sense of the word. Thus it includes ways and results of reasoning, thinking, and learning. In this perspective, it is necessary to take into account the contexts in which human communications appear. But it is also necessary to outline the actual operations and the final outcomes of such communications. Of course there are many ways of approaching communicative functions and results. This framework allows authors to explore, construct, evaluate, and criticize ICT-related phenomena.

There is a need to learn about methods for applying a growing number of hard- and software "systems" to the users. The authors of this handbook are familiar with this line of thinking about actionable knowledge. They refrain from merely introducing the products as fragmented inspirations. Instead, they try out and present their findings on the most effective methods for using the products. They avoid management by objectives in the classical conditioning (behaviorism) tradition. On the contrary, they account for management by cognitive problem solving. And most importantly, they emphasize relation building between interlocutors. Taken together, this ability in the authors of the handbook to synthesize innovative products, emerging methods, and ethical issues builds on a shared perspective, that is, a holistic view building on a (Dewey, 1910; Mead, 1934) inter-subjective symbolic interactionism perspective and a (Vygotsky, 1978; Leontev, 1981) socio-cultural/cultural-historical perspective.

This shared perspective is an achievement because today it is a trick of the trade for experts, development leaders, and consultants to define a number of more or less elaborate, intelligent, and innovative systems. As a consequence, almost anything is labeled a system, that is, the universe, the human brain, a refrigerator, or a community of practice. However, it is far from obvious what the experts imply by the notion of a system. It is hard to tell if they refer to a big-influential, a social-live, a new-emerging, or a dynamic-flexible unit of analysis. It is a minimal requirement that those who take on the role of systems identifiers should clarify the organizing principle for their definitions, delimitations, and applications. As this is rarely the case, the authors of this handbook provide such a structuring principle.

Clearly, a (sub-) system like a chapter in a handbook or an individual in a crowd is a wholeness separated by (semi-)permeable borders often related to the main system. The credo of holism (*holo*, gr.

meaning *whole*) also says that the scope-size-power-impact-influence of a unit defined as a system is bigger than the sum of its parts. However, it is difficult to clarify the specific implications of this motto. And more seriously, the motto only applies to some systems. In fact, the above definition of holism is valid only for so called non-additive systems. In clarifying different systems we have to account for the fact that the way that the functioning of a holistic (non-additive) system is organized cannot be grasped by understanding how the individual elements are internally organized and related. On the contrary, we must identify the organizing principle that decides how the elements are internally related. More specifically, if you know the particular purpose that the unit of analysis (system) serves, you understand why the individual elements operate the way they do. If, on the other hand, your understanding of a system is based on the individual elements that constitute the (sub) system, wholeness is understood as something emerging from the quality, functioning and impact of the individual elements within the system. In such an atomistic view of additive systems, it is natural to adopt a mechanistic-deterministic view of people and the world. Needless to say the authors of this handbook have adopted a non-additive view of human activity systems.

Innovation vs. Tradition

Some old concepts still hold true for analysis of the information society. “Mediation” and “artifacts” are part and parcel of a dialectic relation between man and machine, that is, 21st century interlocutors and computers. First of all, mediation is a relational man-to-man term. But it would be a mistake to define the concept as something that merely supports communication, understanding, and learning. People use many mediating instruments today. Unfortunately, ICT is an implied rather than explicit mediating instrument, especially for those who merely observe the phenomenon from the outside. It is hard for them to discern any kind of structural order in the chaotic mix of instruments, situations, procedures, people, and outcomes. Therefore, it takes a lot of experience and professional experimentation to understand the functioning of certain texts, music through notes, or Web-based research. Luckily, face to face mediation outscored text-based mediation of multi-faceted and factually complex themes. By engaging in direct contact the interlocutors adapt to each other, provide feedback and co-ordinates processes for reaching a shared understanding.

The chapters of this handbook deal with artifacts. Engeström (1987, p. 60-61) develops the concept as a way of understanding human use of tools, instruments, and ‘dead’ physical objects. Another understanding covers processes of verbal communication and a third understanding is the contextualised setting where a purposeful activity takes place. Wartofsky (1979, p. 202, 208) says: “*Primary artefacts* are those directly used in production; *secondary artefacts* are representations of such modes of action.” The tertiary level of artefacts “can come to constitute a relatively ‘autonomous world’ in which the rules, conventions and outcomes no longer appear directly practical, or which, indeed, seem to constitute an arena of non-practical, or ‘free’ play or game activity.” To the above, Cole (1999, p. 91) remarks that tertiary instruments or possible worlds—like for example virtual communities or Web-based universes—“can come to color the way we see the existing world, acting as tools for changing current praxis.” Some authors describe and explore computer machines, software, and similar innovations as primary artefacts. Other authors present procedures and routines as social practices, providing the optimal methods for information exchange. But the majority of the authors of this publication explore computers and ICT-routines as a practical method for developing collective knowledge through developmental functions like human thinking, reflecting, negotiating, and learning.

As we can see from the above, there are many buzz words around. “Web 2.0” and “learning objects,” for example, cover characteristics, processes, relations, and outcomes of many applications. The concept

of Web 2.0 refers to an improved form of the World Wide Web, the latest generation of Internet hypes based on new applications or services. These innovations let ordinary Internet users create contents, cooperate, and share information in ways that used to be impossible. The concept of learning objects also represents a communicative environment that supports growth for the interlocutor, as a public knowledge-constructor and as a responsible person. As a matter of fact, the handbook represents a non-digital entity learning object, that may be used for learning, education, or training. It is also a resource that can be reused to support learning in different contexts. Some chapters describe Web-based interactive chunks of e-learning designed to explain stand-alone learning objectives. Other chapters describe digitized entities which can be used or referenced during technology supported learning. However, the variety of definitions of the buzz words offers little help in the concrete cases. Therefore, the main idea of the handbook is to break the contents down into chunks that can be reused in various communicative environments, to form new ways of thinking about textual and actionable contents, and to communicate independent and self-contained units of learning that can be applied to multiple contexts for multiple purposes.

Producing and Analyzing Data

The intensity of situated research in the field of digital information technology has by far exceeded many other fields of science, and the sheer impact of discoveries has become the driving force of emerging technologies and applications. The field of digital information technology contains a collection of many disciplines that researchers have explored. This methodological development has been accomplished through innovative research methods producing results that clarify people's understanding of the potentials, problems, and challenges of old methodological approaches and disciplines.

During the 1970s, computer technology was mainly deployed for numerical data processing. In the 1980s, the new technology had a focus on dissemination of information. The advent of PC's in the 1990's and the ability of users to communicate regardless of location directed information technology into the lives of the whole society. During the past decades, www-technologies have allowed people to exchange information on a global basis. Today the technology allows readily available communication for everybody, thus utilizing its full potential. Many chapters in this handbook center on the idea of field research. Situated approaches to researching, understanding and describing ICT-applications build on the researcher's emphasis on studying local customs rather than theories about general practices (Friedman, 2001). The authors' methodological approaches to research and development is based on a shared problem solving procedure. Their common goal is to find a solution, expand an activity, satisfy personal curiosity, and generate new knowledge. Such research presupposes committed participation from the practitioners of a researched context because they supply actionable knowledge based on a local theory about situated activities and they assess the likelihood of success for a specific initiative for change. Thus understood, committed research help change people's attitudes to for example work, stability and change, helping them become the cultural carriers of Web-based values. The handbook chapters illustrate approaches that favor an attractive democratic strategy for collecting and analyzing data. But even more important, the methodological approaches and strategies will survive as situated practices, change projects or organizational development. Actors, activities and (sub) cultures will have a realistic chance of spread, renewal and spin-off.

ETHICAL ISSUES

The marriage between values and computers by way of communication indicates a method for examining and understanding moral issues pertaining to computing and information technology. Initially, people

referred to “ICT ethics” as “computer ethics.” In doing so they understood analysis of the social impact of computer technology. Eventually, and due to the proliferation of the Internet the term “Internet ethics” came into existence. However, today the term “cyberethics” or “netiquette” is becoming popular. Cyberethics is a relatively young discipline, relating to moral issues of privacy, accuracy, ownership, and accessibility of data on the Internet. The rise of a combination of techniques and ethics as a self-sufficient discipline reflects the attempts of the industry to deal with social issues in general. People who display ethically correct behavior refrain from harassment, fraud, or crimes, and their moral behavior is concerned with how they as employees and/or citizens consider the effects of their Internet activities on other people and their communities.

Some 20 years ago, Victor and Cullen (1987) proposed a model for understanding ethical issues related to ICT. Their model contains personal, informal, and formal categories. The first component refers to an individual’s private code of ethics regarding communication and computer technology. The second component includes peer influence such as expectations and accepted behaviour. The third component covers production logics, company interest, codes of practice plus business rules and regulations. So, ethically correct interactions, attitudes and behaviours contribute to a work climate of either caring, instrumental or rule-oriented interactions. In general terms, it is reasonable to argue that an ethically correct ICT-related workplace climate is useful for profitable business. And an ethical environment supported by an explicit constitution is one way of managing the risk of unethical behaviour.

There is bound to be some development of morals, values, and ethical behaviour when novice interlocutors are invited, introduced, and eventually accepted as members of virtual communities of practice. Lave and Wenger (1991) describe morally acceptable participation in social systems. More specifically, they outline how beginners become legitimate members of communities of practice. Newcomers become full members by practising basic but yet productive verbal exchanges. Through such interactions, they become acquainted with the tasks, the vocabulary, the goals, and the organizing principles of the community. Gradually they get more engaged, adopt culturally valid behaviours, and carry the culture of their community forward as expert communicators. This process of gaining acceptance, influence, and authority implies an ability in the beginner to negotiate a morally acceptable personality. The newborn expert’s identity incorporates the past and the future of the beginner plus his/her experiences and participation in the shared culture. Lave and Wenger (1991) argue that legitimate peripheral participation is something other than an elaborate pedagogical strategy or teaching technique. It is a way of understanding learning as situated and as a function of the activity and culture in which it occurs. This appreciation stands in sharp contrast to most classroom learning situations, which are operated, changed, and analysed as being abstract and out of context. Therefore educators should strive to always apply the basic principles of situated cognition into their practices by way of morally just arrangements. They should present learning in an authentic context, and encourage social interaction and collaboration. Such pre-defined and rich contexts for interactive teaching and learning reflect the students’ interpretation of the real world and help improve their transfer of knowledge and their ethically correct behaviour to/in a variety of situations.

SUMMARY

In launching a handbook project, it is necessary to cover a wide scope of inventions, applications, and values related to people’s technology mediated communications. Researchers from all over the world have assisted in providing a number of approaches to the development of digital information technologies. One major objective has been to mirror the variety of research related to global and local environments,

academic disciplines, and national cultures, thus providing a comprehensive list of references related to innovations, methods and ethics.

In order to provide a balanced coverage of issues related to ICT, some 70 researchers were asked to submit thematic proposals describing their potential contribution to a handbook. Their contributions were carefully reviewed, their records of similar work with the proposed topics were scrutinized, and the best 33 chapters were selected. The goal was to assemble the broadest possible coverage for publication in a handbook of digital information technologies. Upon the receipt of full chapter proposals, each submission was forwarded to two expert reviewers in a double-blind peer review process. The finally included chapters are written by knowledgeable, dedicated, and distinguished scholars. Consequently, this handbook covers a comprehensive set of relevant findings, methods, concepts, issues, and emerging technologies.

The contents of the handbook will expand knowledge in this field because the coverage of the chapters provides a source of reference for trans-disciplinary approaches to digital information technologies. Practitioners, scholars, and decision makers will find a rich source for understanding concepts, issues, problems, trends, challenges, and opportunities related to ICT. This publication and its comprehensive pieces of information will assist practitioners, research, students, and decision makers in their work. I hope that the handbook will inspire readers to take on new approaches to ICT, thus contributing to the growing body of discoveries in this field.

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