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HCI - Our Changing World Technological advances dictate Human & Human Relations

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ABSTRACT: The question persists and indeed grows whether the computer will make it easier or harder for human beings to know who they really are, to identify their real problems, to respond more fully to beauty, to place adequate value on life, and to make their world safer. It describes how the world around us has changed and continues to change, and how the design of computers is helping to create a new socio-digital landscape and how the field of HCI can contribute to making this landscape one that reflects the values we hold as well as provide opportunities for the expression of diversity in those values. Being human is not simply a label; it is about a set of Aspirations. Recognizing those aspirations and striving to realize them can make the world we live in one to celebrate rather than fear. Human-computer interaction (HCI) is the study of how people design, implement, and use interactive computer systems and how computers affect individuals, organizations, and society. It is an interdisciplinary area, emerging as a specialty concern within several disciplines, each with different emphases: computer science (application design and engineering of human interfaces), psychology (the application of theories of cognitive processes and the empirical analysis of user behaviour), sociology and anthropology (interactions between technology, work, and organization), and industrial design (interactive products).

KEYWORDS: Socio-digital Land scape; Aspirations; HCI; Interactive Computer system; Human Interfaces; Cognitive Process.

I. INTRODUCTION

Major changes have occurred within the computer revolution; changes which encompass all aspects of its role. These are not just quantitative in nature, such as exponential increases in processing power and storage capacity, but are more fundamental, pointing not only to the function of computer technology, but its emerging diversity both in terms of its form and place in the world. Computers are now embedded within a huge range of materials and artifacts and take on roles in almost all aspects of life. People and lifestyles are altering. These changes are sometimes spurred on by technology, but other times Work in parallel or provoke technological innovation. There is a global scale of change which is taking place hand in hand with new technologies. This gives rise to tensions between individuals and governments, and between Globalization and cultural diversity. In this Part, we comment on change at all levels, and provide pointers to where we are going in future.

Fig-1

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There have been various computer-driven revolutions in the past: the widespread introduction of the personal computer (PC) was one, the invention of the graphical browser was another, and the Internet yet another. There have also been Computer eras where one type of computer has dominated, having straightforward implications for whether the Computers were shared or personal, and for whether they were specialized commodities or not .But The ways computers have altered our lives, all aspects of our Lives, is more comprehensive than, at first blush, recollections Of these technological revolutions or eras might suggest [4].Computers affect how we undertake the most prosaic of activities – from buying food to paying our bills – and they do so in ways we might not have imagined when the first personal computers arrived on our desks. They have also created wholly new experiences, for example, allowing us to inhabit virtual worlds with people from many different parts of the globe [2]. In between these extremes, from the prosaic to the wholly new, computers have taken over from older technologies in ways that looked merely like substitution at first but which have ended up creating radical change.

Literature Survey on HCI

According to Diaper (2005) the chronology of HCI starts in 1959 with Shakel's paper on "The ergonomics of a computer" which was the first time that these issues were ever addressed [1]. This was followed by Licklider who produced what has come to be known as the seminal paper (1960) on "Man – Computer Symbiosis" which sees man and computer living together. There was no further significant activity for almost 10 years when in 1969 the first HCI conference and first specialist journal, "The International Journal of Man-Machine Studies" was launched [3]. The 1980s saw the launch of three more HCI journals and conferences with an average attendance of 500 (Diaper 2005). It was not until the 1990s that the "I" in HCI switched from "interface to "interaction" reflecting the vastly expanding range of digital technologies. It was also during the 1990s that the term "Usability" has come to be synonymous with virtually all activities in HCI.

GUI s to Gestures

Most of us learned how to use a computer by interacting with a personal computer, using a keyboard and mouse to point, click and select icons and options from menus. We began with creating documents by using word processors, doing calculations using spreadsheets and making fancy slide shows using presentation applications. Input to the computer was fairly intuitive, drawing on the metaphor of a virtual desktop, that allowed us to do all these tasks through the 'graphical user Interface' or GUI allowing us to interact with graphical objects on the screen rather than relying solely on typed commands[2]. The GUI has dominated the way we interact with computers for over twenty years.

Fig-2 A multi touch interface for playing music.

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In the last few years, new input techniques have been developed. For example, there are tablet computers that use stylus-based interaction on a screen, and even paper-based systems that digitally capture markings made on specialised paper using a camera embedded in a pen. These developments support interaction through sketching and handwriting. Tangible interfaces have also been developed, where everyday physical objects are embedded with computation,being able to sense and react to the ways they are picked up, manipulated, and moved in space.

Handsets to the World in our Hands

A widespread and dramatic development in the everyday use of computers is the global explosion of mobile devices. From virtually nothing twenty or twenty-five years ago, Mobile phones are rapidly becoming the most ubiquitous form of computing [3]. Very significant part of the digital future will fit into the palm of our hands.

Fig-3 from the first mobile phone 'brick' to the latest Apple iPhone: as the size reduces, the potential expands.

Simple Robots to Autonomous Machines that Learn

Robots have been with for us for some time, most notably as characters in science fiction movies, but also as part of assembly lines, as remote investigators of hazardous situations, as search and rescue helpers in disasters or faraway places (eg Mars). More recently, domestic robots have begun appearing in our homes as autonomous helpers. For example, robots are being developed to help the elderly and disabled with certain activities, such as picking up objects and cooking meals. The Roomba Vacuum cleaner has also become a commercial success.[1]It can be left alone to automatically navigate its way around owners' homes cleaning as it goes. The BEAR ('battlefield extraction and retrieval') is another kind of Robot developed by the military, designed to find, pick up and rescue people in harm's way. Pet robots, in the guise of human companions, are also being commercialized, having first become a big hit in Japan. The robots provide a companion to talk to or cuddle, as if they were pets or Dolls. The appeal of these kinds of robots is thought to be partially due to their therapeutic qualities, being able to reduce stress and loneliness among the elderly and infirm.

Fig-4

Fig-5

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Fig-4 Emotional kitty: a robot Hardware platform called I cat uses a set of logical Rules to convey emotional States as it makes decisions, with the goal of improving Human-robot interaction. It looks confused if it's in trouble, smiles if it gets something right.
Fig-5 the Rovio robotic webcam is wirelessly connected to the Internet. It roams around the home providing an audio and video link to keep an eye on family or pets when you're out.

II. CHANGING LIVES

By 2020 more people than ever will be using computing devices of one form or other, at the same time, each generation will have its own set of demands. 'Silver Surfers' will want much more from technology than Web Browsing, while the ipod and iphone generation will be replaced by multiple other new generation Xs[4]. Technology Will continue to have an important impact at all stages of life. The way we grow up, live together and grow old is inextricably entwined with computers, whether we like it or not. For each of these stages of life we look at one particular topic in terms of technological developments: What it means to learn, to be a family, and to be healthy and active in old age.

Learning Differently

The nature of learning is changing significantly as more and more technologies are assimilated into children's lives. For example, *how* learning happens (eg taking part in a discussion with people from all over the world on Second Life) and *when* it happens (eg listening to a podcast about Pollution while on the school bus home) are diversifying.There are ever more opportunities by which children can Access, create and share content with others. Likewise,The nature of teaching is changing, both in terms of how teaching is undertaken and in how its benefits are measured. For example, the way teachers and professors engage with their students during class (eg using interactive whiteboards and tablet pcs to make comments) and after Class (eg use of online assessment tools to provide feedback and reports) is very different from the 'chalk and talk' Model of the past.
A diverse range of technologies has been developed for educational purposes, from multi-media learning tools to mobile measuring and sensing tools. Interactive whiteboards and wifi are also becoming more commonplace in schools. As the cost of pc s dramatically drops and cheap mobile phones become more like computers it is likely that the vision of one computer for every child world-wide will be more of a reality by 2020.However, while our schools may be flooded with cheap Computers, what really counts is how children and their Teachers use them in a learning context. As resources and tools like Wikipedia, Google, Word and PowerPoint become second nature, this is likely to change the way Children create, solve problems, express themselves and understand the world. Likewise, the new generation of Teachers, who have been brought up with computers themselves, will increasingly be able to customize and incorporate these resources into their lessons.

Fig-6 Ubi-learning in the Ambient Wood (University of Sussex):a boy using a digitally augmented probe tool that shows real time measurements of light and moisture on an accompanying mobile device

Changing societies

Governments are using computers and, in particular, the Web, in more ways than ever. They do so both to inform their citizens (eg sickness benefits, visa requirements) and to gather information about them (eg returning online tax forms, voting online at an election)[4].Cameras take pictures of car number plates to automatically bill owner's. Identity cards

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and passports have increasing amounts of digital information embedded in them. Technology is making the relationship between government and the individual more complex, not least because it is often difficult to know how much information is being gathered, how it is being used, and who has control of it. The bottom line is that global connectivity is real indication that one set of rules will govern.

III.HCI: THE WAY FORWARD

Do we simply let technological advances dictate what it will mean to be human in the age of ubiquitous computing or can HCI as an interdisciplinary community of researchers, practitioners and designers become more proactive in helping to shape society's new relationships with computer technologies? A quite different mindset is needed for thinking about how to design for, how to control and how to interact with emerging Ecosystems of technologies. While many researchers in HCI have begun to broaden their horizons, there is much work to be done. To begin, HCI needs to understand and analyze the wider set of issues that are now at play, most notably Human values, including the moral and ethical aspects of designing technologies for new domains. The kinds of Interactions we are designing for are beginning to have far reaching consequences for people beyond the immediate Actions they are engaged in. For example, designing a Mobile communication device that makes visible to others in the vicinity a person's interests and dislikes may also enable anyone else in the street and beyond to permanently track, record and 'see' what that person is doing on their Device. What we make visible and what we keep hidden at an interface, how that is accessed and how it is represented to others, will be affected by and affect, in turn, the social behaviors, norms, and practices that are considered ethical and acceptable.

IV. CONCLUSION

HCI needs to move forward from concerns about the production and processing of information toward the design and evaluation of systems that enable human values to be achieved. Doing so requires HCI to shift its epistemological constraints away from their psychological roots towards other approaches, such as the philosophical, where conceptual sensitivity to Meaning, purpose, and desire is possible. This suggests adding a fifth stage to HCI's conventional design/research model: a stage of conceptual analysis where we consider the human values we are trying to support or research. This affects the whole cycle of research and design, including how we understand the user, how we do studies in the field and the laboratory, how we reflect on the values sought in design, how we build prototypes and how we evaluate our designs. Finally, HCI researchers need a larger assembly of skills and know-how if they are to succeed, which has implications for the concepts, frameworks and theories of HCI.

V. FUTURE RECOMMENDATIONS

Revisit research and design methods in HCI
Explore new ways of understanding users
Reconsider how to evaluate digital technologies
Develop disciplinary techniques that allow HCI to collaborate with other Research communities
Teach HCI to the young
More advanced training for future HCI researchers

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