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Foreword

Since the development of the machine designed by Alan Turing to the present day, the human-computer interfaces have been progressing in various fields at the rate of use.

Initially, computers derived from Turing machine (1936), responded to mathematical needs and its applications focused just to the scientific field; and like almost every technological development was promoted to improve the war performance.

In this process, we generally recognize as some of the major milestones the Z1 (1938) by Konrad Zuse, the Harvard Mark I (1944) by Howard H. Aiken team, Colossus (1944) by Tommy Flowers, the ENIAC (1946) from the University of Pennsylvania, the binary EDVAC (1951) conceived by John von Neumann, the IBM 650 of serial production (1953) and the IBM 360 with integrated circuit boards (1964).

It is perhaps from this moment, that together with the development of processors and commercial microprocessors from Intel, advances in software and hardware introduced by Apple, IBM and Microsoft were added, allowing to extend the use of computer professionals in the applied sciences. These developments and massive applications, forced to think and devise better human-computer interfaces. Many of these ideas resulted in progress for the development of ergonomic keyboards, the integration of Mouse and logical software, which have not stopped until today.

However, it is crucial to analyze which other impacts have produced these advances in computers. In the domestic sphere, from the 80s interfaces and digital-logic processing were introduced into our daily lives, digital watches first, then the management of VHS video recorders. Subsequently the TV, audio equipment, mobile and dashboards of vehicles (90s); white line products and the remaining electrical appliances (early 2000s).

All the technical and scientific disciplines and professions from all the areas were progressing with the improvements offered by the development of new human-computer interfaces. At first, it was required hyper-specialization to operate the technologies in each discipline, however, at the present stage of development, each profession can take full advantage (and in an intuitive way) of the most advanced technologies to achieve the highest standards in their discipline work.

All the technical and scientific disciplines and all areas professions were progressing with the improvements were offering the development of new human-computer interfaces. Initially, hyper-specialization required to operate the technologies in each discipline, however at this stage of development, each profession can make the most (and intuitively) most disruptive technologies to achieve the highest standards in their work discipline.

The wealthiest socioeconomic segments of Generation X, were able to experience these advances from the different microcomputers and personal computers: Texas Instruments TI-99/4A (1981), Commodore 64 (1982), Microdigital TK 83 (1982), Sinclair ZX Spectrum (1982), Microdigital TK 85

(1983), IBM Personal Computer XT (1983), IBM Personal Computer / AT (1984), Apple Macintosh 128K (1984), Microdigital TK90X (1985), Commodore 128 (1985), IBM Personal System / 2 (1987), IBM PS / 1 (1990); gradually enjoying improvements in the speed, visual interfaces, the addition of color and sound, Mouse, TrackBall, TouchPad, camera, microphone, the several operational programs (software), among others.

At the present stage of development of human-computer interfaces, issues of the ongoing investigation by the different universities and centers of scientific and technological development show that the challenges are centered on readings and optical projections (2D, 3D and holographic) for its operation, the decoding of gestures, direction and focus of the eyes and various applications of these advances to improve the physical and visual ergonomics, the automation, education, e-government and public and private management.

In order for these progress achieved greater intensity and speed on its development, it is important to systematize the existing information, ideas, research and analysis of results. Other key is to spread the different digital resources to "connect the dots" as Steve P. Jobs (2005) said, to produce innovations, tangible improvements that society can take advantage and enjoy.

This Handbook of Research on Human-Computer Interfaces, Developments, and Applications, represents a commitment of researchers from different universities of the world, who want to improve the relationship between man and machine, looking for more people to use computer technology and thereby achieve greater welfare for the whole of society.

We are pleased to invite you to this exciting challenge, to discover what these researchers are thinking for our future, which successes they have achieved and what their next challenges will be.

We hope that readers can find "new dots" in this valuable compilation of articles, to develop new ideas, designs and innovations, which helps bring further progress in this interdisciplinary field.

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