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Visions of the Future of Computing and Communications Technology

The presentation reviews, and raises questions about the way in which personal computer and mobile communications technologies will be used in the near and medium-term future. The evolutionary paths of the relevant technologies are reviewed and it is argued that they are converging rapidly. Inasmuch as mobile communications have a clearer forward plan and a larger sales base, they appear set to become a dominant paradigm. However, the lack of vision regarding the way in which they might be used, and the slow rate of development of appropriate content, suggest that the industry needs to consider the wider implications and to think very radically and creatively about future applications. Work to develop new applications and the media content to display on phone-type screens will be reviewed.

Mobile phones already contain a large amount of computing power: they can display images and they can connect to the Internet. They have smaller storage capacity that desk-bound devices, but this is being overcome by Cloud storage. Their communications capacity is rapidly increasing, and ideas for making them more convenient for the user are steadily being pursued, although radical ideas seem necessary to facilitate desirable advances.

Given their larger numbers, their popularity in the developing world, and the problems of getting instant access to personal computers, there is a good chance that mobiles will replace PCs for many applications. However, the mobile phone will have to change substantially since its input and output interfaces to the human being are currently very limited (i.e. the keypad, the voice system and the screen). This, in turn, means that it could become more like the so-called wearable computer, with a high resolution screen display projected into the eye and various human output devices distributed around the body: the Google Glass device is an important development in this direction.

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Clearly, the tablet computer has become popular as a compromise between the mobile phone and the PC, but it has some significant deficiencies, lacking the full flexibility of a PC and also lacking the easy portability of a phone. It will be suggested that the tablet modality will not have a long life as it is likely to be supplanted by wearable devices, which are more portable and permit an even larger effective screen size. On the other hand, the mobile phone may also metamorphose into a device that is mainly a transceiver, with some of the screen functionality being taken over by the smart watch.

In parallel with this, however, it is essential that new 'content' is developed, i.e. material that is useful or entertaining, to be displayed on the screens of mobile devices, thus making people want and need them, and providing a business model that will fund the continuing evolution. Although recent years have seen a burgeoning of basic content, it is mainly a small version of content designed for the desktop screen, and more imaginative designs, linked to wearable-type hardware, are expected to yield more transformative results. In particular, there is a need to break away from the "desktop" paradigm and wearable devices are much more likely to move towards augmented reality forms of display, simply because of the need to overlay on to the user's actual view of the world.

Current thinking on these technologies will be discussed and illustrated, with some discussion of forecasting for the future.

Biography

Peter Excell is Professor of Communications and Deputy Vice-Chancellor at Glyndwr University in Wrexham (Wales, UK). He obtained his BSc in Engineering Science from the University of Reading in 1970 and his PhD, for research in Electromagnetic Hazards, from the University of Bradford in 1980. From 1971 to 2007 he was with the University of Bradford (UK), rising to Associate Dean for Research in the School of Informatics. His classical academic interests cover wireless technologies, electromagnetics, engineering computing and antennas. However, he has also engaged with interdisciplinary initiatives, developing broader interests in mobile communications, their future content and applications. He has published over 400 papers and holds three patents. He is a Chartered Engineer and Chartered IT Professional, a Fellow of the British Computer Society, the Institution of Engineering and Technology and the Higher Education Academy, a Senior Member of the IEEE and a member of the ACM.

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