

Preface

First we thought the PC was a calculator. Then we found out how to turn numbers into letters with ASCII — and we thought it was a typewriter. Then we discovered graphics, and we thought it was a television. With the World Wide Web, we’ve realized it’s a brochure.

—Douglas Adams

The technological changes over the last four decades have perhaps rightly been termed as “the third industrial revolution.” It was some 36 years ago on 12 August 1981, when IBM launched its first PC. The first IBM PC had an Intel 8088 processor that ran at the speed of 4.77 MHz, it had a base memory of 16 kB expandable to 256 kB, and it carried no hard disk drive and only benefited from two 5–1/4 in, 160 kB capacity “floppy disk” drives.

Comparing what was on offer then and now, where significant computing power is packed in our smart devices, demonstrates the amazing journey of technological advances over the past four decades. Devices capable of easily and seamlessly exchanging “terabytes” of data, processors capable of over 4.5 GHz of processing speed, and a global connected community over a billion strong point to a different world and possibilities that would have been very hard to imagine in 1981. As historical evidence shows, the development of human society has always been associated with significant social and economic costs. It is therefore not surprising that the current phenomenal growth also comes with significant costs in terms of energy that is required to keep a 24/7365 virtual world running and for us to access as we wish.

The current volume, second in our four-part series on sustainable futures, attempts to shed some light on some of the key concepts surrounding the impact of technology on our future.

Section one of this volume is dedicated to “Internet of things” (IoT) and “smart living,” where subjects and concepts such as cloud computing, big data, “fog” computing, cognitive middleware, and context aware interaction in a smart living environment are explored.

Section two of the volume is dedicated to a number of very interesting case studies related to “smart living.” Case studies around data science applications for independent

and healthy living and a comprehensive framework for elderly healthcare monitoring in a smart environment are presented.

The final section of the book deals with the “technological” as well as some of the “environmental” challenges we face. Issues around environmental responsibility, energy consumption by network infrastructure and how we can monitor and reduce it, the ethical dimension of designing health technologies, and virtual vulnerability are discussed.

Eric Schmidt, executive chairman of Google, “In Tech We Trust and The Future of the Digital Economy” at Davos 2015, stated that: “Everyone gets smarter because of this technology... and the empowerment of people is the secret to technological progress. [In the future], the Internet will disappear... you won’t even sense it, it will be part of your presence all the time...” While the development of the past 40 years certainly provides the ground for such predictions, we should also be very mindful that this future is not marred by developing further divide between the north and the south and the “haves” and “have-nots.” There is no doubt in my mind that we can and we should use technology as a force for good and for developing a bright future for humanity, but this can only happen if we are aware of the shortcomings as well as the strength of the emerging trends and technologies and ultimately who controls them. The current volume goes some way to provide the bases for some of these discussions.

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