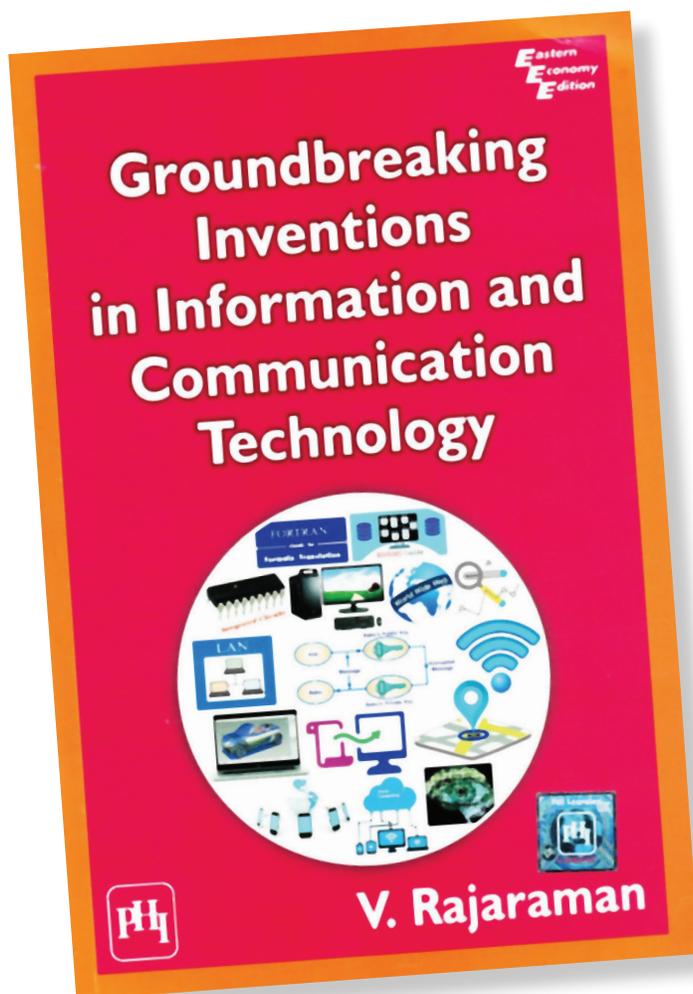


# The Computer Revolution



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## Title

*Groundbreaking Inventions in Information and Communication Technology*

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## Author

V. Rajaraman

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**Reviewed by**  
**Anand Parthasarathy**

**T**HE undisputed doyen of computer educators, Professor V. Rajaraman wrote his first book – and the first Indian textbook – on *The Principles of Computer Programming*, fifty years ago, soon after he helped launch the first BTech programme in the country, at IIT Kanpur. The catalogue of his publications on the website of Prentice Hall of India (PHI) stretches across 15 pages. At 87, Prof. Rajaraman, currently emeritus professor

at the Supercomputer Education and Research Centre of the Indian Institute of Science, Bangalore, can be seen in his office on most days, still immersed in the wonders of Information Technology.

His latest work on the ground-breaking inventions in ICT over the last 65 years, takes the total of text books and popular science books authored by him to over 25. Expanding on and updating a series of articles he wrote for



“Resonance”, the science education journal of the Indian Academy of Sciences, Prof. Rajaraman examines how the computer revolution happened; which inventions fuelled the revolution; who were the inventors who made it happen and how these innovations affected our lives.

The book focusses on 15 inventions, starting with the Fortran programming language which in 1957 exploded the number of people who could control a mainframe computer, from the small numbers who could write in the binary code of ones and zeros to anyone who could remember instructions in simple English. A year later, came the world’s first integrated circuit, which crammed dozens of circuits on to stamp-sized pieces of silicon. The author reckons that the then next significant invention had to wait for almost 12 years when Relational Data Base Management Systems (RDBMS) came into use, followed quickly by the first computer network or Local Area Network (LAN).

The invention of the Personal Computer or PC in 1975, with significant contributions from IBM on the hardware and Microsoft with the software, as well as the pioneering desktop designs from Apple, proved to be one of the radical innovations of the last century. Prof. Rajaraman intersperses his text with a rich collection of boxes which do justice to the men and women behind the machines. It is a reflection of how young the entire science of infotech is, that so many of the innovators like Bill Gates of Microsoft and Steve Wozniak of Apple are still happily around.

Two more innovations round off the 1970s: public key cryptography and computer graphics. Then came the biggest revolution of them all: Internet in the early 1980s, with its origins in a US Defence Department project. Dr Vint Cerf

the father of the protocol that is still used to interconnect computers is also still with us – as an Internet Evangelist at Google. The Internet grew to become the World Wide Web (WWW) by the 1990s and that is the avatar still in use today. It triggered another invention: Search Engines, even as other scientists put together the Global Positioning System or GPS, the basis of terrestrial navigation today.

While doing ample justice to the innovators who helped create Internet and the WWW, Prof. Rajaraman might have spared some space for the pioneers – both scientists and bureaucrats – who, against huge odds, helped launch the Net in India and its first version – ERNET – so soon after the global launch and ahead of many developed countries. This would have added some relevance and value for Indian readers.

Similarly, when dealing with GPS the author does mention early Indian efforts centred around ISRO, but in a book published in 2020, one would have expected that the huge achievement of commissioning India’s own positioning system – NAVIC – in 2019, be at least mentioned.

It was in the last months of the previous century that semi-portable computers made their appearance, though the laptop PC as we know it today, proliferated only in the early 2000s, even as the standard known popularly as WiFi, provided the umbilical between PC and Internet. Prof. Rajaraman also allocates a section to the digitization and compression of multimedia which might look like an odd choice, till he explains how video has overtaken text and still images as the most potent form of communication today.

The author salutes the advent of the mobile phone and cellular telephony, arguably the only invention to touch the life of every single Indian. He rounds off his survey of 15 inventions in ICT with a nod at Cloud Computing and a review of what he calls Deep Learning – essentially a combination of Artificial Intelligence and Machine Learning.

The format of the book with a good proportion of the space given to illustrations and supplementary biographical notes in boxes, lends itself to easy delving to find what the reader wants. While serving as a good reference for any technology professional, the book is simply written for lay readers. But perhaps its core target audience is the student community: those looking for help with preparation for competitive examinations or class projects will be very well served.

Considering the selling price, I would have expected the publishers to have been a bit more generous with the use of multi-colour for illustrations, instead of resorting to a blue tinge on most pages which reduces readability.

That apart, Prof. Rajaraman’s latest work lives up to the impeccable standards he has set for himself, and which readers have come to expect from him.

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