

APPENDIX 2

COMPUTERS, MICROPROCESSORS AND INTERNET: A COUNTERFACTUAL HISTORY¹

In this appendix I present an abbreviated counterfactual history of the electronic digital computer, the microprocessor and the internet. In constructing the counterfactual narrative I assume a world in which military and defense related R&D and procurement have played no role in the development of the three interrelated technologies. I have, in effect assumed a world in which World War II and the Cold War either did not occur or at least had no impact on commercial technology development. The timing of events in the narrative is clearly subjective. But it does draw on my study of the development of these three technologies (see Chapters 5 and 6).

1940. First electronic digital computer demonstrated by John Atanasoff at Iowa State University.

1947. Point contact transistor invented by Shockley, Bardeen and Brattain at Bell laboratories.

1960. First commercial electronic digital computer introduced.

1965. First commercial application of transistor.

1968. Planar process integrated circuit invented.

¹ I am indebted to Jeffrey Yost for comment on an earlier draft of this appendix.

1975. Integrated circuits begin to replace vacuum tubes in telephone switchboards and computers.

1980. Minicomputer introduced.

1983 Microcomputer introduced.

1985. NSF initiates support for development of software to enable computers of different design to “speak to each other.”

1992. Computer Interface Message Processor invented.

2002. Internet browser invented.

2004-06. Rapid diffusion of personal microcomputers.

2010. Measurable impact of computer on total factor productivity in private business sector detected.