Nanyang Technological University

HH2017: History of information technology

Semester 1, 2014-2015

[Preliminary version: 27th July 2015]

Academic Units: 3
Pre-requisites: None
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Overview

The History of Information Technology surveys the history of computers and other information technologies from the nineteenth century to the present. Content will include nineteenth century "information technologies" such as Babbage's engines and the telegraph, the invention of the electronic computer, the emergence of networking, the rise of the personal computer, the growth of the World Wide Web, as well as recent trends in computing and information technology such as social networking and cloud computing.

Logistics:
This is a lecture & tutorial class. Lectures will take place on Mondays between 10.30am-12.30pm (in LHS TR+56) and tutorials will be on Tuesdays at either 1.30pm-2.30pm or 2.30pm-3.30pm (in LHS-TR+4).

Learning Objectives

- Understand the origins of modern computers;
- Understand the role of information technology in society and its impact on society;
- Theorize the relationship between technology and society;
- Place contemporary developments in information technology in historical context;

Some important things to know for this module:

Readings
All the readings for the class will be placed online on Blackboard/Edventure, downloadable for your reading pleasure. There is no textbook for the class. However, if you do want an overview of some of the material in the course, there are several books I would suggest:

- Paul Ceruzzi (2003) *A History of Modern Computing* (MIT Press)
- Paul Ceruzzi (2012) *Computing: A Concise History* (MIT Press) [more or less a compressed version of the above]
- Martin Campbell-Kelly and William Aspray (2004) *Computer: A History of the Information Machine* (Westview Press)

- Janet Abbatte (1999) *Inventing the Internet* (MIT Press)
- Ask me if you want more information / reading on specific topics.

MCs
Medical certificates are not a 'get out of jail free' card. Missing a tutorial or lecture without an MC will mean an automatic zero for any attendance and participation marks awarded for that week. Presenting an MC confers on you the *right* to make up the grade for your missed class, but it does not automatically make up for the missed class. Usually, this means I will ask you to write a 500-word response paper on the readings for that week. The grade on this response paper will make up your attendance and participation grade for that week.

Academic honesty
The University rules regarding plagiarism will be strictly enforced in this class. Make yourself familiar with the rules. If in doubt, ask me.

Clickers
It is your responsibility to have your clicker with you and in working order at all times. If you forget your clicker or if it is not working, you will miss any points associated with clicker questions for that week. If you need to change or update your clicker it is your responsibility to inform me of your new ID# as soon as possible. *Passing your clicker to another student to use or using another student's clicker is academic dishonesty*. Any cases of such behavior will be treated as cheating.

Assessment

This class has no final examination. The assessment tasks aim to develop your skills as historians and to ask you to read and think critically about history. The assessment structure will reward those students who work consistently over the course of the semester.

Participation (20%):

This component will be made up of attendance at tutorials and clicker quizzes on reading that will take place during the lectures.

Presentation (25%):

Pick a specific computer or device, tells us about its history and how it works. A list of devices will be provided. You will work in groups to present your findings during lecture time. The size of the groups will be determined in the first week of class based on the overall class size.

Midterm Test (25%)

This will be held during class time in Week 6. It will be based on "identities" from the readings and lecture materials (you will be ask to identify and comment on a person, place, or thing).

Test date: Thursday September 17th [in class]

Multi-Media Report (30%)

This will be due at the end of the semester. It will comprise a research report based on the historical development of a particular technology. The content will must be *diachronic* (that is, track development over time). You will present your findings as a multi-media website – it should include not only texts, but videos, pictures, infographics, etc. The textual parts of the report will also be submitted to Turn-It-In.

Due date: Thursday 12 November, 5pm (online and text via Turn-It-In).

Module Outline and Readings

*Week 1 (August 13th): **Introduction: what is information technology?***

No readings or tutorials this week.

*Week 2 (August 20th): **Computing in the 19th century***

- Bruce Collier and James MacLachlan (2000) *Charles Babbage: And The Engines of Perfection*. ["The Making of a Mathematician", "Inventing the Difference Engine", Reform is in the Air", pp. 8-19, 35-72]
- Charles Babbage (1835) *On the Economy of Machinery and Manufactures.* [Preface, Introduction, Chapters 18 and 19]

*Week 3 (August 27): **When computers were humans***

- Andrew Hodges (1992) "The Relay Race" in *Alan Turing: the Enigma* (Vintage): 160-241.

Machines: Differential Analyzer (Vannevar Bush); Hollerith Machine

*Week 4 (September 3rd): **World War II:***

- Aiken Computer Laboratory (1985) *A Manual Operation for the Automatic Sequence Controlled Calculator,* Charles Babbage Institute reprint series for the History of Computing, vol. 8 (Cambridge, MA: MIT Press): 1-52 [*you don't need to read this in detail and understand it; just try to use it to get a sense of how this computer might have worked*]
- Martin Campbell-Kelly and William Aspray (2004) "Inventing the Computer" in *Computer: A History of the Information Machine* (Westview Press): 79-104.

Machines: Colossus; Z1; Atanasoff-Berry; Harvard Mark I; ENIAC; Manchester "baby"

*Week 5 (September 10th): **Brains and mainframes***

- John von Neumann (1945) 'First Draft of a Report on the EDVAC' Michael D. Godfrey, ed.

- Pamela McCorduck (2004) *Machines who think*. A.K. Peters. ["Meat machines" and "The information processing model", pp. 85-110]

Machines: EDVAC; UNIVAC; IBM 701; Ferranti Mark I; Whirlwind

Week 6 (September 17th): ***Midterm Test / The Transistor and the Integrated Circuit***

- Nick Holonyak (1992) "John Bardeen and the Point-Contact Transistor" *Physics today* 45
- (April): 36-43.
- Christophe Lécuyer (2006) "Revolution in Silicon" in *Making Silicon Valley: Innovation and the growth of high tech, 1930-1970* (Cambridge, MA: MIT Press): 129-167.

We will have the midterm test during the first hour of the lecture time and there will be a lecture on the transistor and the integrated circuit in the second hour.

Presentations will take place in tutorials for this week.

Machines: Busicom calculator; Intel 4004

Week 7 (September 24th): No class due to Hari Raya Haji

Mid-Semester Break

Week 8 (October 8th): ***ARPA and the First Networks***

- Janet Abbatte (1999) *Inventing the Internet* (MIT Press) ["Building the ARPANET: challenges and strategies", pp. 43-82]
- M. Mitchell Waldrop (2002) *The Dream Machine: J.C.R. Licklider and the revolution that made computing personal* ["The intergalactic network" pp. 259-332]
- Fred Turner (2006). "The Shifting Politics of the Computational Metaphor" in *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*, pp. 11-39. Chicago, IL: University of Chicago Press.

Machines: DEC-PDP-1; LINC; IBM 360

Week 9 (October 15th): ***Personal Computers***

- Ted Nelson (1977) *The Home Computer Revolution* (Published by the author): 10-31.
- Paul Freiberger and Michael Swaine (2000) 'Homebrew' in *Fire in the valley: the making of the personal computer* 2nd ed. (New York: McGraw-Hill): 109-136.
- Walter Isaacson (2011) *Steve Jobs* (Simon & Schuster) [Chapter 2-5, pp. 21-70]

Machines: Altair 8800; Apple I; Apple II; Commodore PET; Commodore 64; Commodore Amiga

Week 10 (October 22nd): ***Users***

- Ian Hardy (1996) "The Evolution of ARPANET Email" Honors thesis, Department of History, University of California Berkeley.
- Michael Hauben, Ronda Hauben, and Thomas Truscott (1997). "The Social Forces Behind the Development of Usenet," pp. 48-58 in *Netizens: on the history and impact of Usenet and the Internet.* Wiley-IEEE Computer Society.
- Finn Brunton (2013) *Spam: A Shadow History of the Internet* (MIT Press) ["Ready for the next message, 1971-1994", pp. 1-62.]

Machines: Modem; Fibre Optics; Usenet; Telenet; NSFNET; Compuserve

Week 11 (October 29th): ***World Wide Web [E-Learning Week]***

- Tim Berners-Lee (1989) "Information management: a proposal" Available at: http://www.w3.org/History/1989/proposal.html
- Paul Ceruzzi (2012) *Computing: A Concise History* (MIT Press) ["The Internet and the World Wide Web", pp. 121-154]

Machines: NEXT; Mozilla; Netspace; HTML

Week 12 (November 5th): ***Making It Smaller***

- G.E. Moore (1965) "Cramming More Components Onto Integrated Circuits" *Electronic magazine* 38, no 8. [4pp.]
- Paul Ceruzzi (2003) *A History of Modern Computing* (MIT Press) ["The Chip and its Impact, 1965-1975", pp. 177-206]
- Jon Agar (2004) *Constant Touch: A Global History of the Mobile Phone* (Icon books). ["World in bits" and "Smartphones"]

Machines: IBM 5100; Osborne 1; Epsom HX-20; GRiD Compass; RAZR (Phone); Nokia 1100

Week 13 (November 12th): ***Web 2.0 and the Facebook Generation***

- Tom Boellstorff (2008). "The Virtual," pp. 237-249 in *Coming of Age in Second Life: An Anthropologist Explores the Virtually Human*. Princeton, NJ: Princeton University Press.
- Sherry Turkle (1995). "Introduction: Identity in the Age of the Internet," pp. 9-26 in *Life on the Screen: Identity in the Age of the Internet.* New York: Simon & Schuster.
- Evgeny Morozov (2012) *The Net Delusion: The Dark Side of Internet Freedom* (Public Affairs) ["Why the KGB Wants You to Join Facebook" and "Open Networks, Narrow Minds: Cultural Contradictions of Internet Freedom", pp. 143-178 and pp. 205-244]

Machines: Semantic Web; Javascript; Ajax; XML; HTML5