Nanyang Technological University
HH2017: History of information technology
Semester 1, 2019-20

Draft Version // Subject to Revision

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 and tutorials will take place on Mondays.

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.

Technology Enhanced Learning
This class has been partially developed as a "Technology Enhanced Learning" module. This means that some of the activities for the class will take place online. In some weeks you will be expected to complete activities online either before or after attending lecture/tutorial. In particular, weeks 1, 2, 4, 8, 9, and 11 of the module have such activities. These activities will count towards your final grade.

Practicum tutorials
At least two of the tutorials (weeks 3 and 13) during the semester are designated as "practicums." This means that you will have to work "hands-on" with computer hardware. Activities based on these weeks will count towards your final grade.

Extensions and late work
Any late work will lose marks at the rate of 10% of the maximum grade per 24-hour period or part thereof [late 1 hour = 10% penalty, late 26 hours = 20% penalty, late 71 hours = 30% penalty]. Extensions for assignments will be considered on a case-by-case basis in extraordinary circumstances. No extensions will be granted within one week of the deadline.

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.

Online learning and practicum learning (20%):

This component will be made up of online activities and exercises based on the practicum tutorials. These will be handed in and graded on a week-to-week basis. No particular exercise from any week will count for more than 5% of your total grade.

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 or second week of class based on the overall class size.

Midterm Test (25%)

This will be held during class time in <mark>Week 7</mark>. It will be based on "identities" from the readings and lecture materials (you will be asked to identify and comment on a person, place, or thing).

Test date: *Monday 23rd September [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: *Friday 15th November, 5pm (online and text via Turn-It-In).*

Module Outline and Readings

*Week 1 (August 12th): **No class meeting, Hari Raya Haji***

- <mark>Watch introductory lecture online ("What is information technology?")</mark>
- <mark>Online activities TBD</mark>

*Week 2 (August 19th): **Computing in the nineteenth 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]

- <mark>TEL exercises</mark>

*Week 3 (August 26th): **When computers were humans***

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

- <mark>Practicum tutorial 1: Calculating with adding machines</mark>

Machines: Differential Analyzer (Vannevar Bush); Hollerith Machine

Week 4 (September 2ⁿᵈ): **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.

- TEL exercises

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

Week 5 (September 9ᵗʰ): **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 16ᵗʰ): **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.

Machines: Busicom calculator; Intel 4004

Week 7 (September 23ʳᵈ): **Midterm Test**

We will have the midterm test during the first hour of the lecture time. No tutorials this week.

Mid-Semester Break

Week 8 (October 7ᵗʰ): **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.

- TEL exercises

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

Week 9 (October 14th): ***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]

- TEL exercises

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

Week 10 (October 21st): ***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 28th):* ***No class meeting due to Deepavali holiday***

- TEL exercises

Week 12 (November 4th): ***World Wide Web***

- 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 13 (November 11th): ***IT hardware in China: outsourcing and its consequences***

- Reading TBD

- <mark>Practicum Tutorial 2: building copycat electronics</mark>

Machines: <mark>Shanzhai phone; Huawei mobile phone;</mark>