LUISS Università Guido Carli

T067 – INF/01

Information Systems

Academic Year 2017 / 2018

Prof. Filippo Castiglione

Chapter 0

Introduction to the course

Orientation

- Instructor:

  Filippo Castiglione
  Institute for Applied Computing (IAC)
  National Research Council of Italy
  f.castiglione@iac.cnr.it
  www.iac.cnr.it/~filippo

  f.castiglione@luiss.it

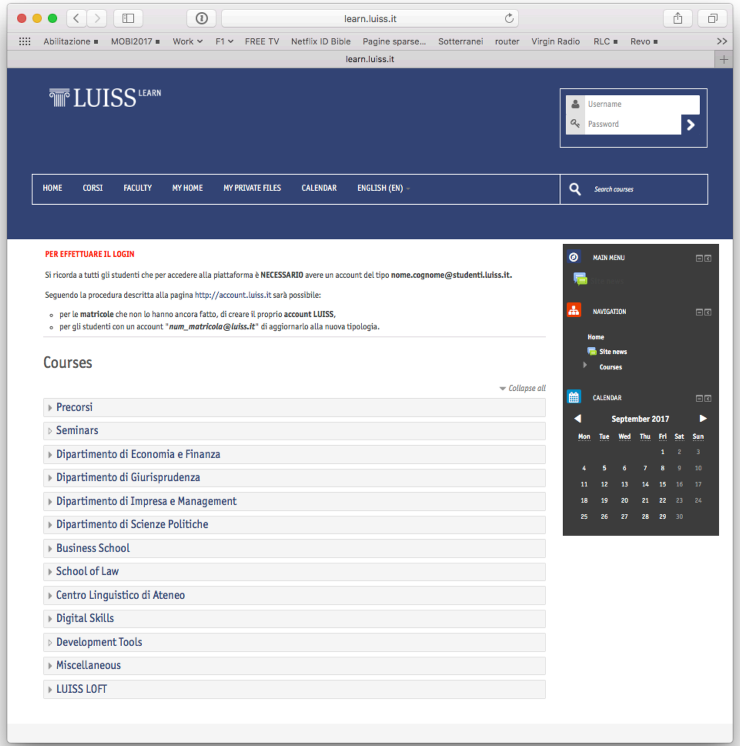
Orientation

- Office hour
  - When: Tuesday 16:00 – 17:00
  - Where: Viale Romania – IV floor – professor room

Orientation

- Class Web Page

  http:// http://learn.luiss.it



Classes

Tuesday	Friday
14:30 – 16:00 [A101]	13:45 – 15:15 [info A306]

Information society

- An **information society** is a society where the creation, distribution, use, integration and manipulation of information is a significant economic, political, and cultural activity.
- Its main drivers are digital information and communication technologies, which have resulted in an information explosion and are profoundly changing all aspects of social organization, including the economy, education, health, warfare, government and democracy.

Why learn about IS?

In the Internet era, where information can be exchanged via multiple carriers and applications, Information Systems (IS) are at the heart of almost every business interaction, process and decision.

Why learn about IS?

Hence, managers and entrepreneurs underestimating the IS value within the organizational system, risk to drop participation or definitively miss important decisions.

Why learn about IS?

Based on these considerations, a basic knowledge of what a computer system is represents a fundamental building block for students in economics and business.

All of them will interact daily with enterprise IS/Information Technologies (IT), some will even manage IS departments or IT companies, facing the complexity of decisions to be taken in this quickly evolving area with great technical and economical potentialities.

Why learn about IS?

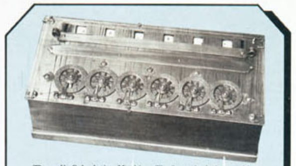
The course is focused on the fundamental topics of the Information Systems, as Computer Systems, Computing Components and Architecture, Communications and Networks, Databases, Knowledge Management and Decision Systems, and Information security.

Learning Objectives

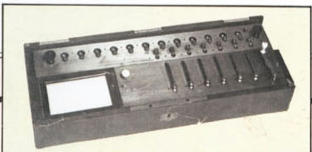
- To understand what an IS is.
- To explain how IT impacts upon organizations.
- To analyse the necessity for IS in the management of modern, and increasingly global, organizations.
- To recognize that IT professionals need to understand how an organization operates in order to effectively apply technology to make the organization more efficient and competitive.
- To explain how an organization must change in order to successfully capitalize on the use of IS and the consequent impact on organizational structure and employees.
- To identify how the benefits of using IS may be measured and assessed, and contrast with existing practice.

History of Computers

This chart has been designed to give a broad view of computer development and the connections and influences between the various manufacturers. The centre section traces the machines themselves, and reads from left to right. For the sake of clarity it was not possible to include every single type of computer (see various notes down the right hand side). Every effort has been made to ensure the information is accurate, but the publishers can take no responsibility for any errors in the chart or text.



Pascal's Calculating Machine. The first calculating machine is believed to have been designed in 1623 by Wilhelm Schickard of Tübingen, but the only specimen was destroyed by fire the following year.
Blaise Pascal, the French scientist and philosopher, invented his first calculator in 1642 when he was nineteen, and in just ten years he developed over fifty models capable of addition and subtraction. This picture of one of Pascal's machines shows the series of wheels carrying digits from 0 to 9, and the results windows similar to the display on a modern calculator.



The Arithmometer. In 1820 the first commercially mass-produced calculating machine was devised by a financier, Thomas de Colmar, and some 1500 machines to his design were sold over a period of sixty years. The Arithmometer represented a great step forward, being capable of addition, subtraction, division and multiplication. Many variations of the machine were sold well into this century.

Charles Babbage. In his quest to produce a machine to compute and check tables to twenty places of decimals, Babbage started work on his first Difference Engine in 1822. From 1833 onwards, Babbage spent much of his life planning a mechanical Analytical Engine, now regarded as an early ancestor of computers. This was to be instructed and controlled by punched cards and was to perform any calculation for which the ground rules could be specified in advance. No complete Engine was ever constructed; fragments of both Difference and Analytical Engines are in the Science Museum, London.

Herman Hollerith. Hollerith developed the use of punched cards for data processing to cope with the 1890 Population Census in the USA. Hollerith's equipment consisted of a primitive hand punch, a sorting box and a tabulator containing the card reader. The early 20th century saw the rapid growth of punched card machines and many computers still operate to instructions and data carried by punched cards.

Differential Analysers. These machines were large-scale calculators developed to handle the time-consuming task of solving differential equations. The first analyser was completed in 1930 by Dr. Bush in the USA and it was used in the Second World War for ballistic and trajectory calculations. An experimental version made of Meccano parts was built by Professor Hartree of Manchester University. This led to full scale versions at Manchester and elsewhere in Britain. They were the most powerful machines for calculations before the advent of electronic computers.

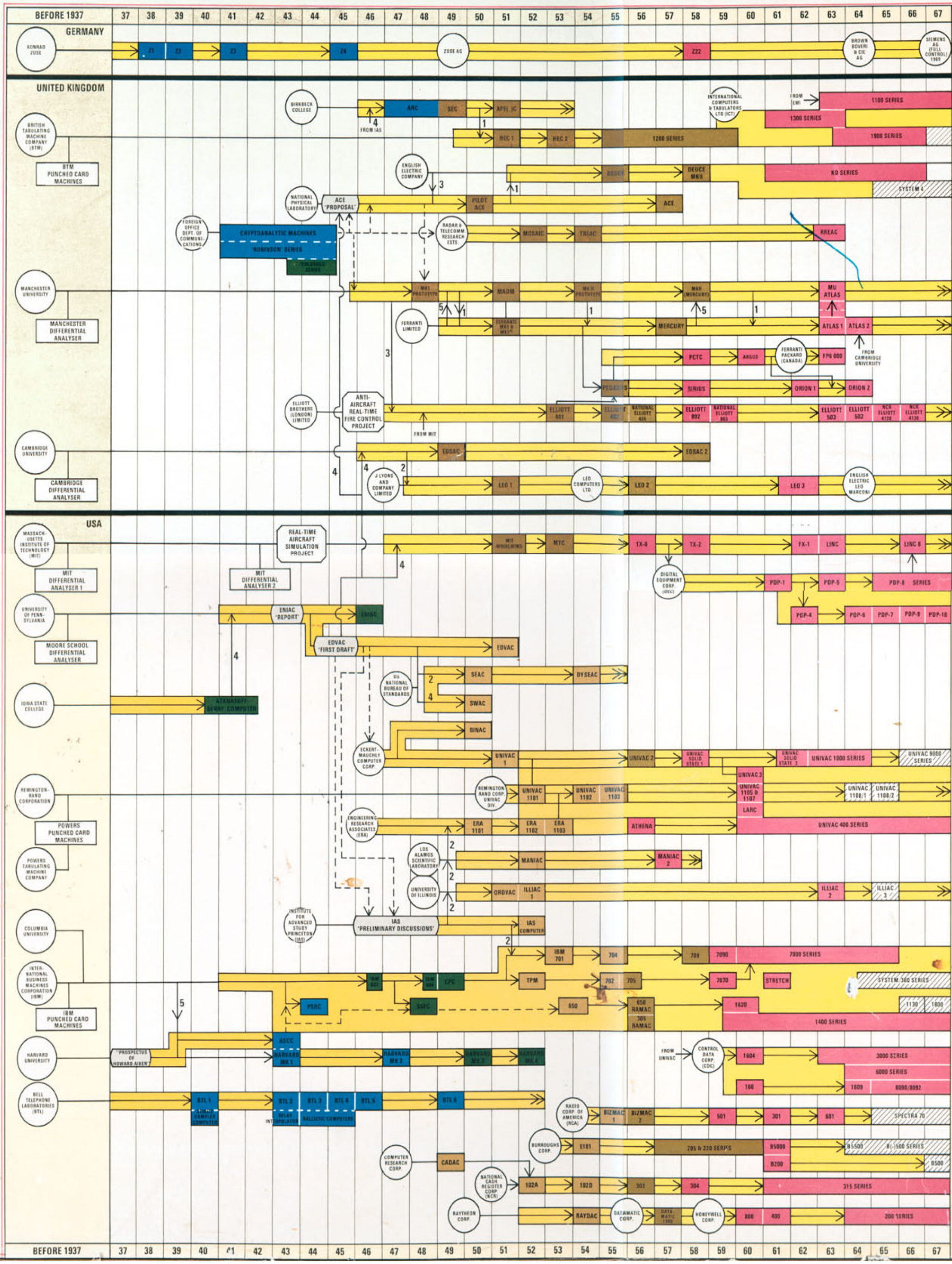


CHART NOTES

Zuse developed his program-controlled computers in Germany independently of that in other countries. His early machines were destroyed in the 1939–45 war, only the Z4 survived. His early achievements were overtaken by USA and UK research.

The UK group omits a number of small experimental and research machines, and some short-lived commercial ones. Some contributed valuable experience to subsequent developments in the main line of digital computer history.

A series of mergers and takeovers in the UK computer industry culminated in the formation of ICL (International Computers Limited) from ICT and its subsidiaries. Several series of computers first produced in the 1960's continued in production as part of the ICT, and later ICL ranges.
Some of the companies have been omitted for clarity, their production machines were either discontinued, or absorbed into ICT – eg EMI's EMIDEC 1100 and 2400, the AEI 1010.

Research continues to the present day, the latest Manchester machine, MU5, began operating in 1973. It was built in co-operation with ICL.

Ferranti developed the PCTC into their ARGUS control computer, first produced in 1962, and have continued its development in a series of process control computers up to the present day. Their production of large-scale machines was sold to ICT.

Other European countries did experimental work, mainly based on USA experience, but were slow to produce commercial machines. Of those which were made, the most notable are the Bull 300 series and Gamma 60 in France, and the Stantec ZEBRA, designed by van de Poel in Holland and built by STC in the UK.

A number of independently designed research machines have been omitted as contributing little to the main lines of computer development. Many university projects were abandoned when computers became available commercially. Also omitted are the many special-purpose machines and systems commissioned for defence and government projects, eg NORC, SAGE and those for the space program. The specifications for them were such that their technology was in advance of that available for commercial computers of the time, and they provided a test-bed for new techniques.

Research continues to the present day, with ILLIAC IV, which first operated in 1972. This machine has 64 processors working in parallel, and was built to the University's design by the Burroughs Corporation.

GENERAL NOTES

The word 'series' has been used to denote continuous development of a particular design, or a planned series of compatible machines as announced by the makers.

Where possible dates have been taken as either the year in which a machine first operated successfully or, in the case of commercial machines, the year of announcement. Some dates have been difficult to establish with certainty, and some commercial machines had long delay times between announcement and first installation.

The diagram shows the 'generations' of computers as determined by the technology used.
The first generation is usually that of the valve machines; the second those using transistors and the third the integrated circuit machines which are still being built.

However, there was an earlier generation, the mechanical and electromechanical machines which preceeded introduction of the valve.

Between generations there is a transition period – many valve machines used semi-conductor diodes, transistors and valves were used together, and 'logic modules' of closely packed components were used at the time of the first integrated circuits.

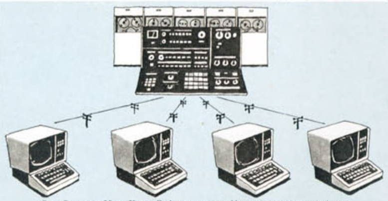
Since 1967 the major developments have been the mini computer, which had its origin in the DEC PDP range, and since 1973 the micro-processor; the small business and visible record computer; and computer networks which connect a number of computers via communication lines, or a computer to a number of terminals. These developments are making the computer much more available to the public.

Valve Computers. The first practical stored program electronic computer to work anywhere in the world was the Cambridge University EDSAC (Electronic Delay Storage Automatic Calculator) in May 1949. Professor Maurice Wilkes designed this machine after visiting the Moore School of Electrical Engineering at the University of Pennsylvania the previous year.
The Moore School had started work on the EDVAC computer earlier than Cambridge but its completion was delayed by the departure of Professors Eckert and Mauchly to form their own manufacturing company.
The early machines used electronic valves and limited storage devices such as mercury delay lines, electrostatic and magnetic drum memories.
Despite the fact that a trial computer to test electrostatic storage was working at Manchester University in 1948 (see illustration), the delay line became the favoured storage system until replaced by core memories.
Although the impetus for early computers came from the scientific field (much of it related to defence needs), 1951 saw the start of commercial data processing with the Univac I (in the U S A) and the first LEO (Lyons Electronic Office) in the U.K.

Transistorised Computers. The middle of the 1950's saw the start of the race to replace the valve with the solid state transistor as a practical component for building computers. The Lincoln Laboratories TX-O machine proved that transistors could compete with the speeds of valve machines, making their acceptance in the scientific field inevitable. The first available transistorised machines in Europe were made by Univac, and by the end of the decade a variety of transistorised machines were used for both scientific and commercial applications.
The most outstanding computer of the early 1960's was the ATLAS from Manchester University. The picture shows Professor Tom Kilburn (right) the designer of ATLAS, and Sebastian de Ferranti at the computer's control panel (Ferranti Limited gave considerable support to the project). Certain features, such as the operation of its storage system, have influenced the design of many modern machines.

Growth of Computer Applications. Parallel with the changeover to reliable transistorised internal components came the improved reliability of magnetic tape drives, and magnetic drum and disc stores. The combination of these elements led to the adoption by major companies of the computer as the basis for commercial data processing. Early in the 1960's the use of computers became predominantly commercial, whereas before, scientific needs had been the major influence in designs. Solid state reliability also led to the first practical use of computers in controlling industrial processes such as chemical production, steel making, etc.

Integrated Circuit Computers. By the early 1960's, electronic circuit technology had advanced to the stage where complete circuits could be produced on small 'wafers' of silicon, (called integrated circuits). Integrated circuits were rapidly incorporated into computers and the standardization this made possible enabled manufacturers to produce 'families' of machines such as the 360 series from IBM and the 1900 series from ICT (later ICL).
From the smallest to the largest machines of the series was a tremendous range in working capacity and speed. The total 'family' of machines could therefore offer a suitable computer for most scientific and commercial applications.



One Computer-Many Users. Early computers could process one program only at a time. In the late 1950's techniques were developed to run several programs 'together', called multiprogramming.
This meant that the fast central processor did not remain idle for so long, while slower units like printers and card readers were operating.
A very important advance in making computers available to many users at a time came in the early 1960's in the U S A. Project MAC, as it was called, first successfully operated a system whereby several users were able to use a computer simultaneously via computer terminals, connected by cable to the central computer. This method of computer use has rapidly advanced so that nowadays hundreds of terminals can be serviced by one computer. Each terminal user has the impression that the entire machine is working for him alone.

KEY TO SYMBOLS

- Originating documents
- Mechanical and Electro-mechanical machines
- Valve computers without stored program
- Valve computers
- Transistorised computers
- Integrated circuit computers
- Transfer of major personnel

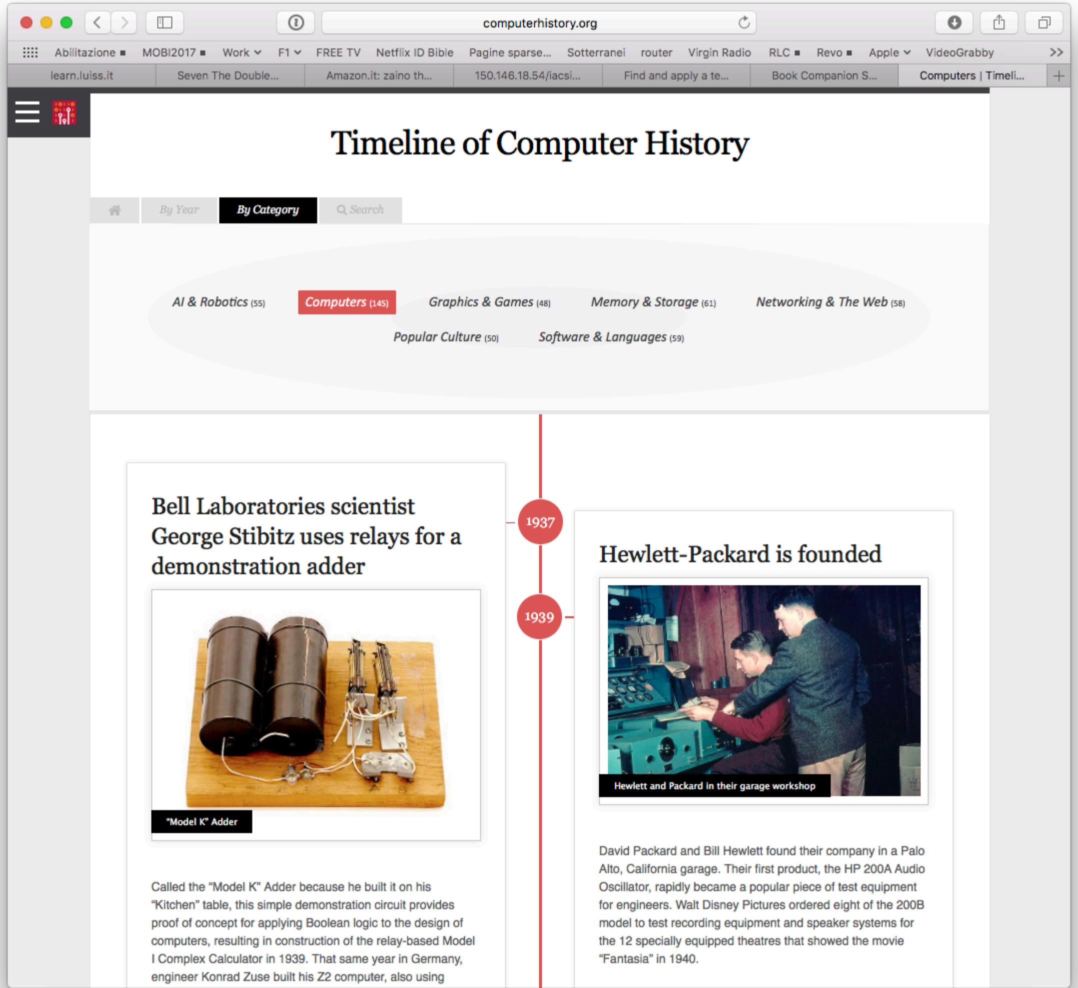
1. Engineered or commercial development of experimental machine
2. Direct influence on general design
3. Influence of specific features or parts
4. Influence of general concepts only
5. Construction of parts or whole machine by commercial company

LIST OF ABBREVIATIONS

ACE	— Automatic Computing Engine
APE( )C	— All-Purpose Electronic ( ) Computer (with letter in brackets to designate one of four models)
ARC	— Automatic Relay Computer
ASCC	— Automatic Sequence Controlled Calculator
BINAC	— BINary Automatic Computer
BIZMAC	— Precise meaning unknown
CADAC	— Precise meaning unknown
CPC	— Card Programmed Calculator
DEUCE	— Digital Electronic Universal Computing Engine
DYSEAC	— Second Standards Eastern Automatic Computer
EDSAC	— Electronic Delay Storage Automatic Calculator
EDVAC	— Electronic Discrete Variable Arithmetic Computer
ENIAC	— Electronic Numerical Integrator And Computer
FX-1	— Precise meaning unknown
HEC	— Hollerith Electronic Computer
ILLIAC	— ILLinois Automatic Computer
KD Series	— Kidsgrove Factory
LARC	— Livermore Automatic(Atomic)Advanced Research Computer
LEO	— Lyons Electronic Office
LINC	— Lincoln Laboratory (MIT)
MADM	— Manchester Automatic Digital Machine
MANIAC	— Mathematical Analyser Numerical Integrator and Computer
MOSAIC	— Ministry of Supply Automatic Integrator and Computer
MTC	— Memory Test Computer
ORDVAC	— ORDnance Variable Automatic Computer
PCTC	— Process Control Transistorised Computer
PDP	— Programmed Data Processor
PSRC	— Pluggable Sequence Relay Calculator
RAMAC	— Random Access Method of Accounting and Control
RREAC	— Royal Radar Establishment Automatic Computer
SEAC	— Standards Eastern Automatic Computer
SEC	— Simple Electronic Computer
SSEC	— Selective Sequence Electronic Calculator
SWAC	— Standards Western Automatic Computer
TPM	— Tape Processing Machine
TREAC	— Telecommunications Research Establishment Automatic Computer
TX-0 and TX-2	— Transistor Experimental Computers
UNIVAC	— UNIVersal Automatic Computer

homework

Timeline of Computer History

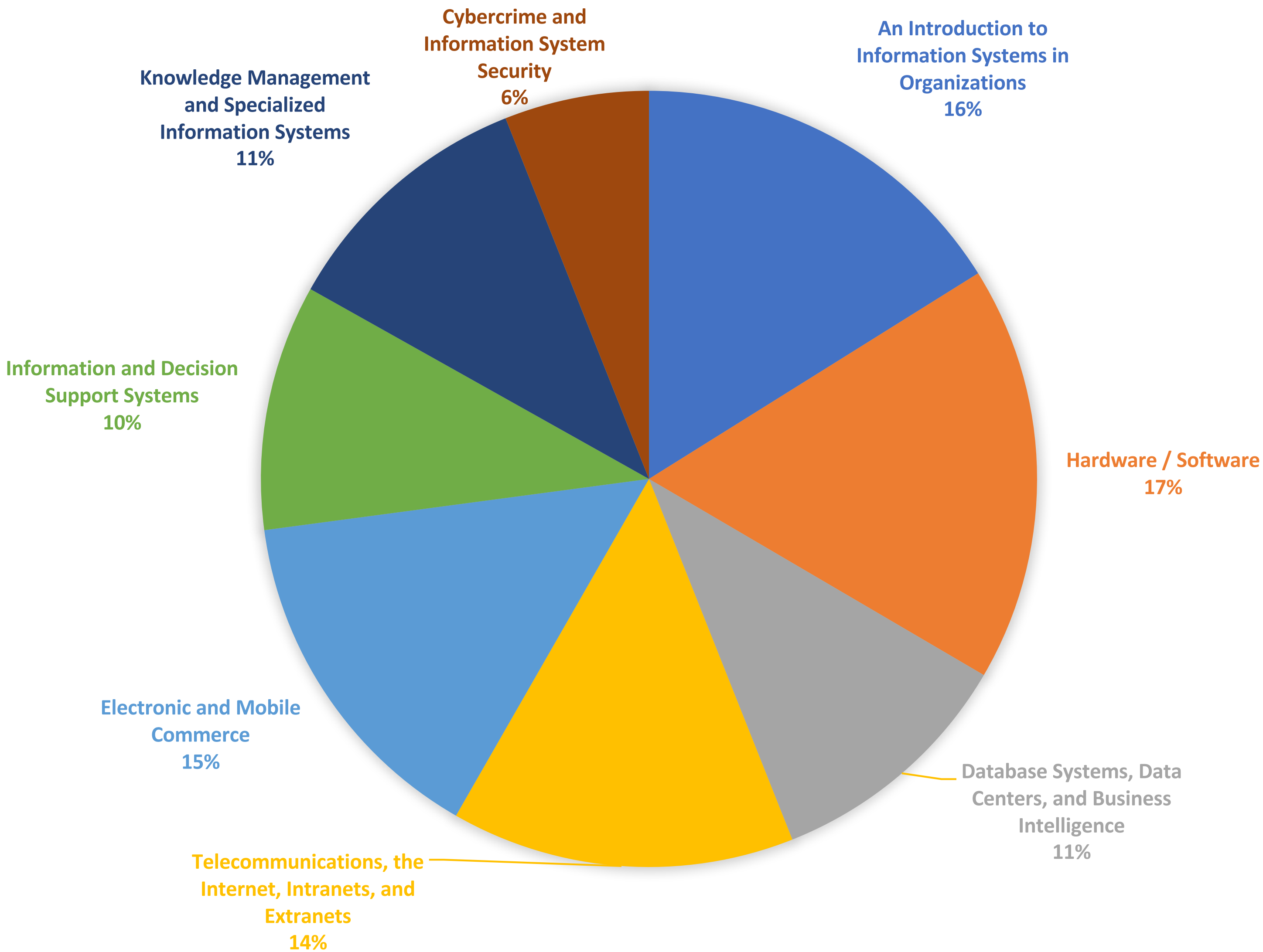


http://www.computerhistory.org/timeline/computers/

Course overview

1. An Introduction to Information Systems in Organizations
2. Hardware / Software
3. Database Systems, Data Centers, and Business Intelligence
4. Telecommunications, the Internet, Intranets, and Extranets
5. Electronic and Mobile Commerce
6. Information and Decision Support Systems
7. Knowledge Management and Specialized Information Systems
8. Cybercrime and Information System Security

T067 course overview: macro-topics



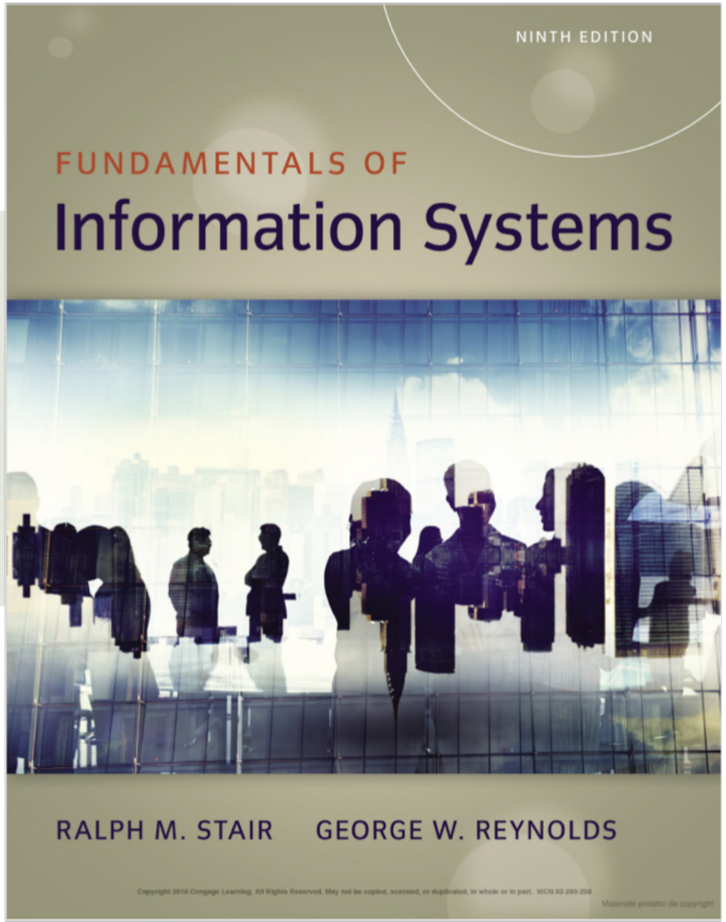
Reference book

Ralph Stair, **George Reynolds**

Fundamentals of Information Systems (9th edition)

Course Technology; 9 edition (March 6, 2017)

ISBN-13: 978- 1337097536



Teaching Method

Class:

theory / slides

Laboratory:

Basic skills for Microsoft Office

Teacher: Dr. Alessandro Palma

Evaluation/Exams

- **With** mid-term evaluation
  - Mid-term examination (Fri Nov 3 + Tue Nov 7, 2017)
    - Multiple choice test regarding the <u>first part</u> of the course
    - Lab/practice with MS Office Word/PowerPoint
  - Final examination
    - Multiple choice test regarding the <u>second part</u>
    - Lab/practice with MS Office Excel

- **Without** mid-term evaluation
  - Final examination
    - Multiple choice test regarding the whole program
    - Lab/practice with MS Office Word/PowerPoint/Excel

Calculation of the score

- **With** mid-term evaluation
  - Mid-term examination
    - 15 multiple choice questions. Score S'_T max 15 (+1 correct, -0.5 wrong)
    - Lab/practice. Max score $S'_P = 15$

  Pass only if $S = (S'_T + S'_P) >= 18$
  - Final examination
    - 15 multiple choice questions. Score S''_T max 15 (+1 correct, -0.5 wrong)
    - Lab/practice. Score S''_P max 15

  Total score $S = (S'_T + S'_P + S''_T + S''_P)/2$

- **Without** mid-term evaluation
  - Final examination
    - 30 multiple choice questions. Score S_T max 30 (+1 correct, -0.5 wrong)
    - Lab/practice. Score max $S_P = 30$

  Total score $S = (S_T + S_P)/2$

Acknowledgements

CENGAGE Learning®

End

This is the last slide - n. 22