

Human Computer Interaction (HCI)

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Lecturer Info

Name	Leon Andretti Abdillah
Position	Associate Professor (Lektor Kepala) Editor and Reviewer of Scientific Journals (AJIS, BIT, COMMIT, ComTech, INKOM, IJASEIT, KSII, SISFO, etc.) Editor and Reviewer of Scientific Conferences (ICIBA, iCLICK, SOSEIC, SEMNASTIK, SEMAGMA, SHaP-SITI, SENTIKOM, SEMNASPOR, etc.) Former Intellectual Property Center, Former Quality Assurance
Faculty	Computer Science (Ilmu Komputer)
Department (Study Program)	Information Systems (Sistem Informasi)
Courses	<ol style="list-style-type: none"> 1. Algorithms and Data Structures 2. Algorithms & Programming 3. Corporate IS Management Lanjut 4. Data Structures and Algorithms 5. Database 6. Human Resource Information Systems (HRIS) 7. Knowledge Management Systems (KMS) 8. Object Oriented Programming (OOP) 9. Programming Concepts 10. Research Methods 11. Systems Analysis and Design (SA&D) 12. Business Modeling – Supply Chain Management (SCM) 13. Customer Relationship Management (CRM) 14. Supply Chain Management (SCM) 15. <u>Human-Computer Interaction (HCI)</u>

Unit Lecture

1. Introduction
2. Human Aspects
3. Interaction Elements
4. Computer Aspects
5. Interaction Paradigms
6. Interaction Design
7. Navigation and Dialogue
8. Prototype
9. Evaluation
10. Hypertext, multimedia and the world-wide web
11. Ubiquitous computing and augmented realities
12. Collaboration with Social Media




Sources

- blog.binadarma.ac.id/mleonaa → Teaching | Human Computer Interaction
- elearning.binadarma.ac.id
- leonabdillah.wordpress.com | Teaching | Human Computer Interaction
- Facebook → HCI 2018-2019 Ganjil → <https://web.facebook.com/groups/1956704757960237/>

Assessment component

- Class activities 15% [Questionnaire + Attendance]
- Middle exam 20% [MidTest]
- Reports 25% [Assignments + Presentation]
- Final exam 40% [FinalTest]
- Total 100%

Rules

- Every student must enrolls or registers, shown by KRS 
- Attendance \geq 80% of 16weeks [13x]
- Late tolerance /meeting = 15 minutes
- Keep your mobile devices silent all the time in the class
- Keep your volume silent all the time in the class
- Casual uniform for daily class 
- At final exam, each student must wear white shirt and black 



Evaluation score

No.	Total Score	Nilai	Bobot
1	085 – 100	A	4
2	070 – 084	B	3
3	055 – 069	C	2
4	040 – 054	D	1
5	000 - 039	E	0

5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
																A	A	A	A
													B	B	B				
										C	C	C							
							D	D	D										
E	E	E	E	E	E	E													

What Is a HCI?

- What does the discipline of HCI cover?
- Why study HCI?

HCI Definition [1/2]

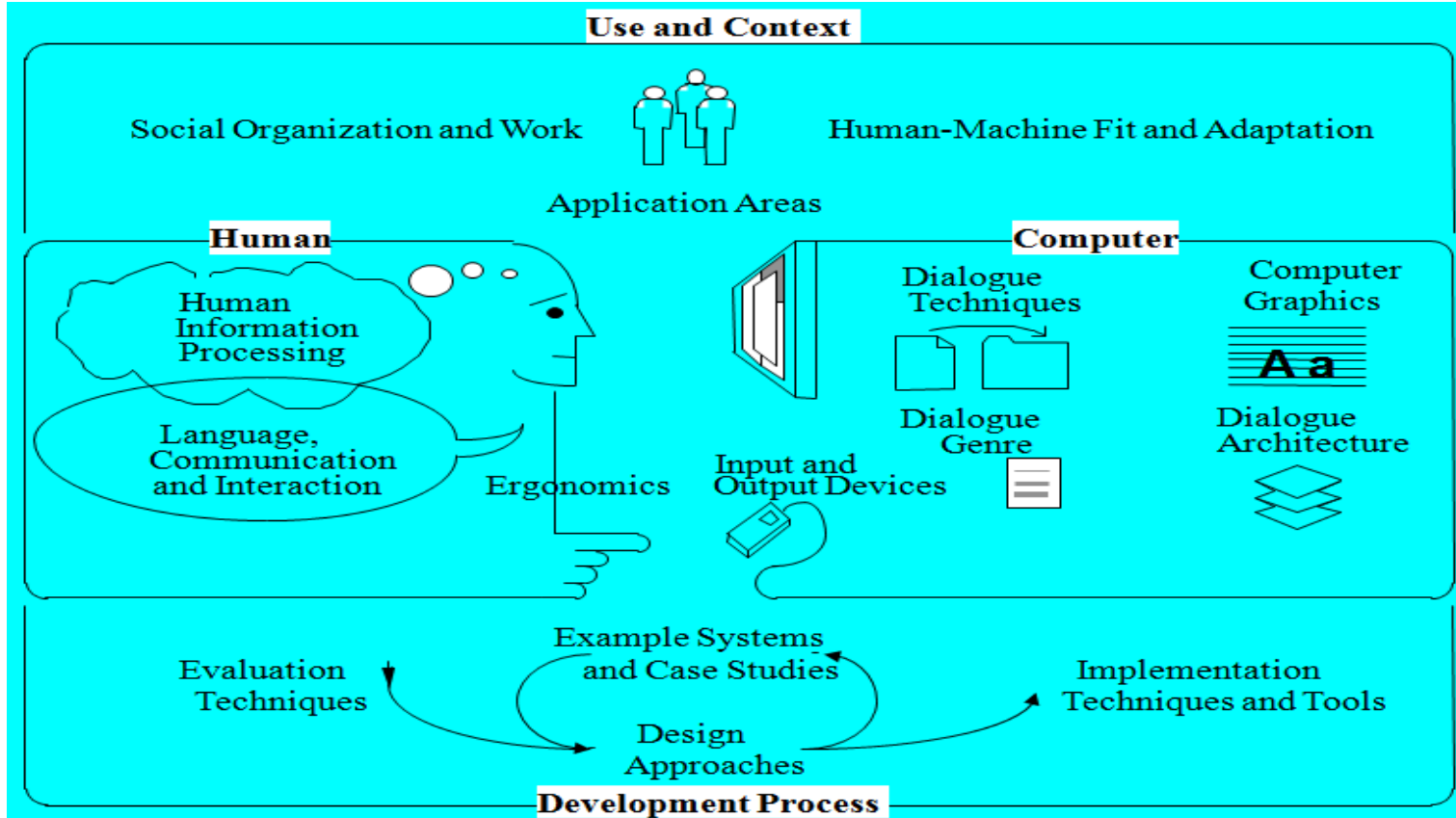
“Human Computer Interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of the major phenomena surrounding them.”

- As defined by the Special Interest Group on Human-Computer Interaction (SIGCHI) of the Association for Computing Machinery (ACM)

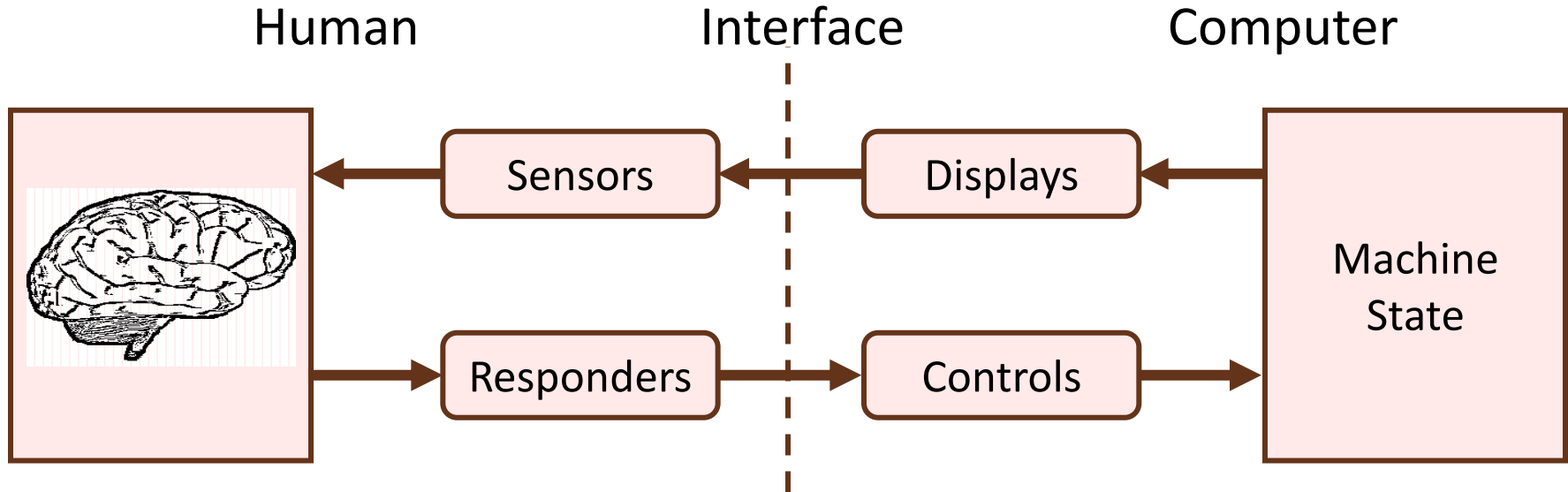
HCI Definition [2/2]

- Human–computer interaction (HCI) is a cross-disciplinary area (e.g., engineering, psychology, ergonomics, design) that deals with the theory, design, implementation, and evaluation of the ways that humans use and interact with computing devices (Kim, 2015).

Overview: Map of Human Computer Interaction



Human Factors Model¹



¹ Kantowitz, B. H., & Sorkin, R. D. (1983). *Human factors: Understanding people-system relationships*. New York, New York: Wiley.

Use and context of computers

Problems of fitting computers, their uses, and the context of use together

- Social organization and work
 - humans are interacting social beings
 - considers models of human activity:
 - small groups, organizations, socio-technical systems
 - quality of work life...
- Application areas
 - characteristics of application domains, e.g. individual vs group work
 - popular styles
 - document production, communications, design, tutorials and help, multi-media information kiosks, continuous control (cockpits, process control), embedded systems (copiers, home appliances)
- Human-machine fit and adaptation
 - improve the fit between the designed object and its use
 - how systems are selected and adopted; how users improvise routine systems; how systems adapt to the user (customization); how users adapt to the system (training, ease of learning); user guidance (help, documentation, error-handling)



Human characteristics

To understand the human as an information-processing system, how humans communicate, and people's physical and psychological requirements

- Human information processing
 - characteristics of the human as a processor of information
 - memory, perception, motor skills, attention, problem-solving, learning and skill acquisition, motivation, conceptual models, diversity...
- Language, communication and interaction
 - aspects of language
 - syntax, semantics, pragmatics; conversational interaction, specialized languages
- Ergonomics
 - anthropometric and physiological characteristics of people and their relationship to workspace and the environment
 - arrangement of displays and controls; cognitive and sensory limits; effects of display technology; fatigue and health; furniture and lighting; design for stressful and hazardous environments; design for the disabled...

Computer system and interface architecture



The specialized components computers have for interacting with people

- Input and output devices
 - mechanics and characteristics of particular hardware devices, performance characteristics (human and system), esoteric devices, virtual devices
- Dialogue techniques
 - the basic software architecture and techniques for interacting with humans
 - e.g. dialog inputs and outputs; interaction styles; issues
- Dialog genre
 - The conceptual uses to which the technical means are put
 - e.g. interaction and content metaphors, transition management, style and aesthetics
- Computer graphics
 - basic concepts from computer graphics that are especially useful to HCI
- Dialogue architecture
 - software architecture and standards for interfaces
 - e.g., screen imaging; window managers; interface toolkits; multi-user architectures, look and feel, standardization and interoperability

The Development Process

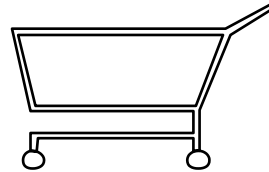
The construction and evaluation of human interfaces

- Design approaches
 - the process of design
 - e.g. graphical design basics (typography, color, etc); software engineering; task analysis; industrial design...
- Implementation techniques and tools
 - tactics and tools for implementation, and the relationship between design, evaluation and implementation
 - e.g. prototyping techniques, dialog toolkits, object-oriented methods, data representation and algorithms
- Evaluation techniques
 - philosophy and specific methods for evaluation
 - e.g. productivity, usability testing, formative and summative evaluation
- Example systems and case studies
 - classic designs to serve as example of interface design genres

Why study human use of computer systems? [1/3]

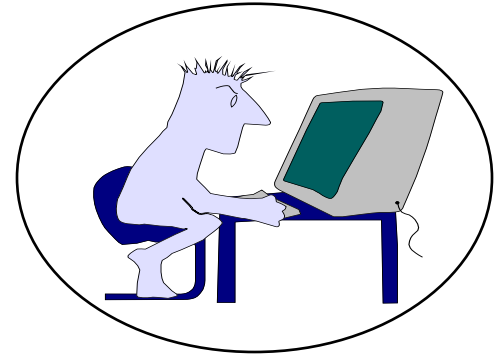
Human-computer interaction

- Business view:
 - to use humans more productively/effectively
 - the human costs now far outweigh hardware and software costs
- Personal view:
 - people view computers as appliances, and want it to perform as on
- Marketplace view:
 - everyday people using computers
 - now expect “easy to use system”
 - not tolerant of poorly designed systems
 - little vendor control of training
 - heterogeneous group
 - if product is hard to use, people will seek other products
 - eg Mac vs IBM (Microsoft Windows)



Why study human use of computer systems? [2/3]

- The system view:
 - complex human
 - complex computer
 - complex interface between the two
- The human factors view:
 - humans have necessary limitations
 - errors are costly in terms of
 - loss of time
 - loss of money
 - loss of lives in critical systems
 - loss of morale
 - design can cope with such limitations!



Why study human use of computer systems? [3/3]



The social view:

- Computers contribute to critical parts of our society, and cannot be ignored
 - educate our children
 - take medical histories and provide expert advice
 - keep track of our credit worthiness
 - play(?) war games (and help form policies)
 - control air and ground traffic flow
 - book travel
 - control chemical/oil/nuclear plants
 - control space missions
 - assist humans with their everyday tasks (office automation)
 - control complex machines (aircraft, space shuttles, super tankers)
 - help control consumer equipment (cars, washing machines)
 - entertainment (games, intellectual stimulation)....

In all these views, economics and human best interests are aligned

Evaluation: Usability

- Usability refers to the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of user (Huang, 2014).
- Usability measures the quality of a user's experience when interacting with a product or system
 - Ease of learning
 - Efficiency of use
 - Memorability
 - Error frequency and severity
 - Subjective satisfaction

You know now

- The HCI discipline includes the study of:
 - the use and context of computers
 - human characteristics
 - computer system and interface architecture
 - the development process
 - Usability evaluation
- HCI is worth studying because it aligns both human interests and economic interests

Homework

1. Prepare your SocialMedia ID (**FaceBook**)
2. Set a **group discussion** consist of 2-4 students for small class (≤ 20), 5-6 students for medium class (21-35), or 7-8 students for large class (> 36)
3. Create an account in CloudPrepare your blog using **WordPress** [**yourname**], create a PAGE/laman of “HCI” or “Human-Computer Interaction”.
4. Create a cloud repository (**DropBox**)
5. Develop your **team project theme** based on the information given from several sources (journals, conference proceedings, books, or master theses). You may use one of these sources: a) GOOGLE SCHOLAR (<http://scholar.google.com/>) or b) MICROSOFT ACADEMIC SEARCH (<http://academic.research.microsoft.com/>)

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