



Health Informatics Basics

Computer Skills for Medical Students

1

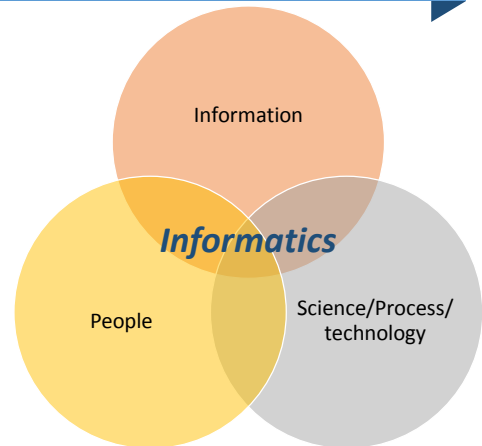
Contents

- 1. Informatics VS Health Informatics**
- 2. Informatics Concepts**
 - *Information Architecture (AI)*
 - *Human- Computer Interaction (HCI)*
 - *Information Assurance and Cybersecurity*
- 3. Health Informatics Fields**
 - *Clinical Informatics*
 - *Nursing Informatics*
 - *Biomedical Informatics*
 - *Dental Informatics*
 - *Nutrition Informatics*
 - *Pharmacy Informatics*
- 4. Health Informatics Applications**
 - *Telemedicine*
 - *Telehealth*
 - *Personal health Apps*
 - *PHR Apps*

2

Informatics

- Informatics is the study of computational systems, especially those for data storage and retrieval.



3

Health Informatics

- Health informatics is the interdisciplinary study of the design, development, adoption, and application of information and technology-based innovations in public health and healthcare services delivery, management, and planning.



4

Informatics concepts

Information
Architecture
(AI)

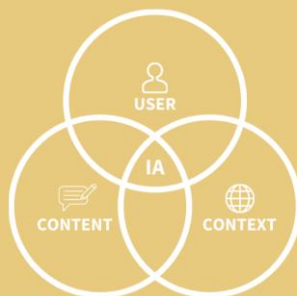
Human-
Computer
Interaction
(HCI)

Information
Assurance
and
Cybersecurity

5

Information Architecture (IA)

Information Architecture



Content

- What kind of information is available?
- What relevance does it have to the user?

Context

- Where is the user seeking out the content?
- When, why and how is the user engaging with the content?

User

- Who is consuming the content?
- What value does it provide?
- What preexisting expectations do they have?

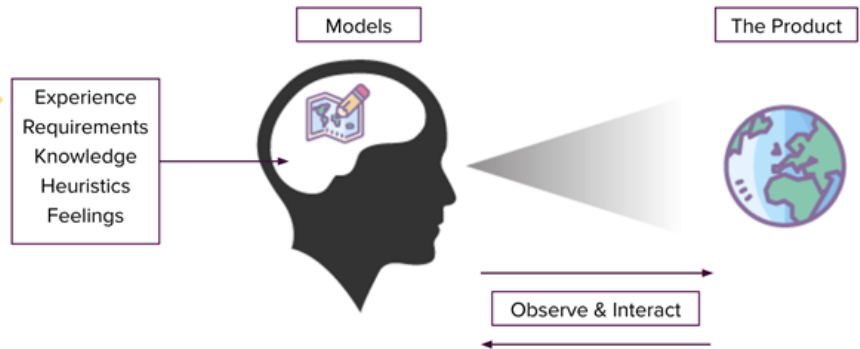
- **Information architecture** is the structural design of information environments that reflects the organization of information in some domain to help in creating and managing digital products.

- We need to understand the interdependent nature of users, content, and context to create information architectures.

6

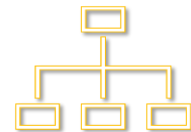
Information Architecture (IA)

Programmers and Informaticists have models in their minds that are based on experience, knowledge, feelings.. etc., they want to reflect these models into real systems, so IA that makes it easier to discover information and to organize them.



7

Information Architecture (IA)

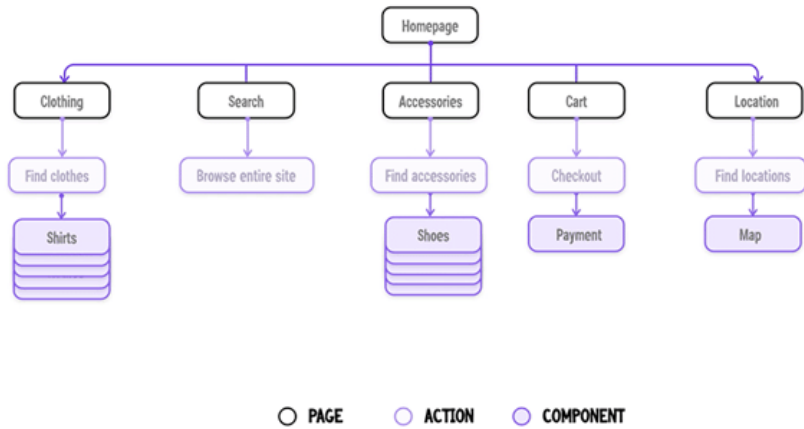


- Informaticists structure the underlying information and its presentation in a logical and intuitive way so that people can put information to use.
- So, They build frameworks to effectively collect, store and deliver information, and drive the navigation, content layout, personalization, and transactional features of the systems and technology

8

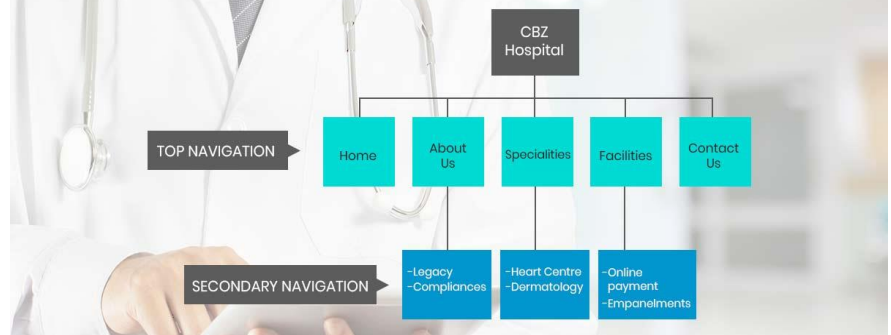
Information Architecture example
(Ecommerce website)

E-Commerce Site INFORMATION ARCHITECTURE



Information Architecture example
(Hospital website)

Example- Information Architecture of a Medical Website



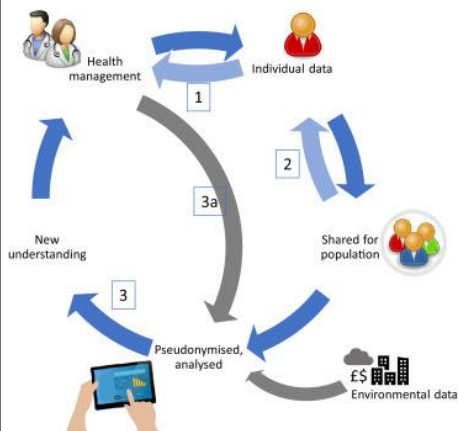
Human–Computer Interaction (HCI)

Human- Computer Interaction (HCI) is a multidisciplinary field that studies the design and use of computer technology, especially the interfaces and interactions between people (users) and computers.



11

Human–Computer Interaction (HCI) *in the Health domain*

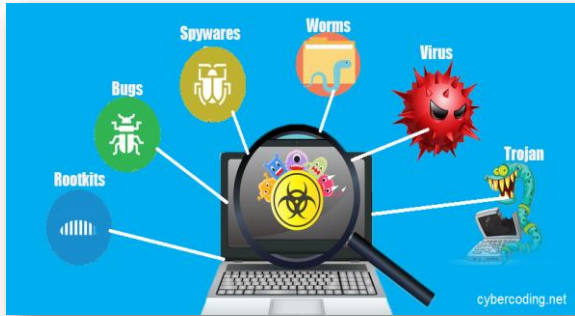


Health informaticists use HCI for two reasons:

1. to observe the ways in which humans interact with computers and technology in the healthcare field
2. to design technologies that let humans interact more effectively for healthcare in different ways

12

Information Assurance and Cybersecurity



- **Information Assurance:** is the practice of assuring information against risks related to the use, processing, storage and transmission of information.
- **Cybersecurity:** is the practice of protecting systems, networks, and programs from digital attacks

13

Information Assurance and Cybersecurity (cont.)



- Information Assurance and Cybersecurity are both used to create and manage **safe and secure systems**.
- They are very important for all **healthcare organizations** because they help us to build, maintain, deploy and use secure health information systems and technology

14

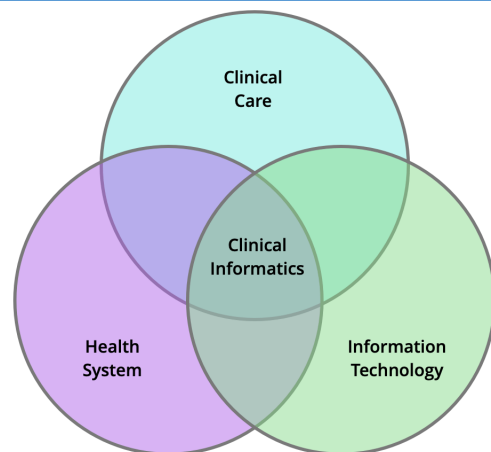
Health Informatics Fields



15

Clinical Informatics

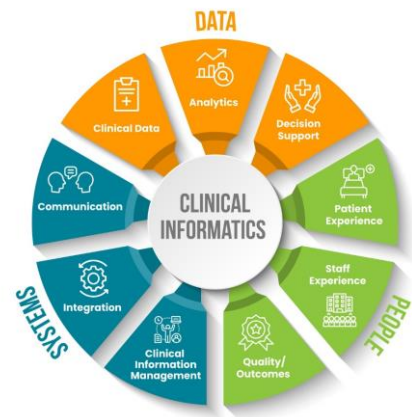
- a subset of health informatics which involves the application of informatics and information technology to deliver healthcare services.
- It blends information technology into clinical care processes, usually within a health system.



16

Clinical Informatics (cont.)

- Includes a wide range of topics such as:
 - Clinical decision support to visual images (e.g., radiological, pathological, dermatological, ophthalmological, etc.)
 - Clinical documentation
 - Health signal monitoring
 - Management of patient-doctor encounters
 - Nursing care
 - Etc.
- example:
 - <https://www.ibm.com/industries/healthcare/services>



17

Nursing Informatics

Subfield of clinical informatics that integrates nursing science with informatics.

- Includes:
 - Management of records about admitting and discharging patients.
 - Hospital bed management.
 - Management of therapy charts such as respiratory therapy.
 - Patient emergency response.
 - Patient recovery analysis.
 - Emergency alert system.
 - Nursing procedure charting.



18

Biomedical Informatics

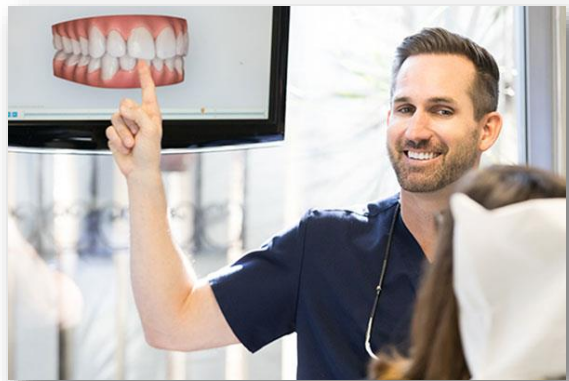


- Biomedical Informatics uses information extracted from bioinformatics to solve problems, reduce medical errors, lower healthcare costs, and make healthcare decisions using an individual patient's biological data.
- Bioinformatics is the application of computer technology to manage, manipulate, and interpret large amounts of biological data. bioinformatics aims to analyze genetic data to further gene-based research and discover medical cures.

19

Dental informatics

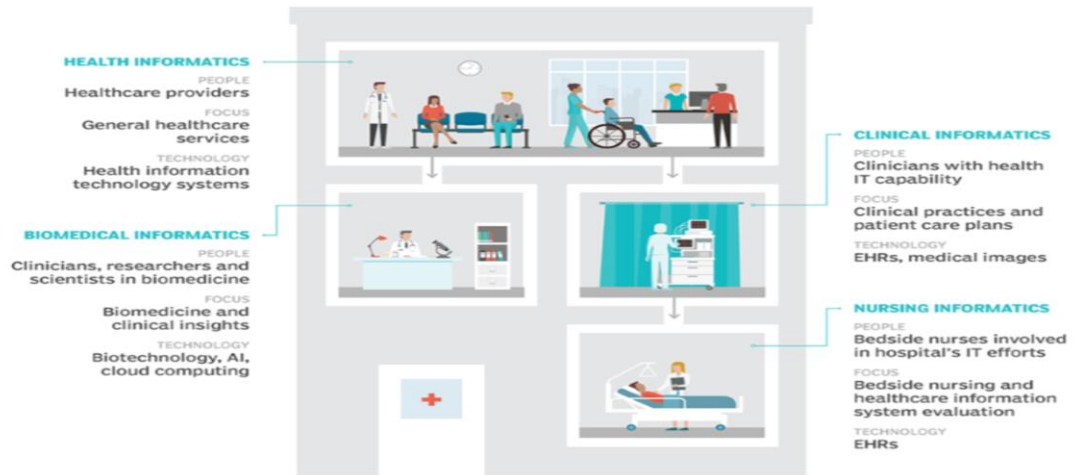
Dental informatics is the application of computer and information science to improve dental practice, research, education and management. The field of dental informatics is concerned with the intersection of health informatics and dentistry as a whole .



20

Informatics comparison

Health informatics, clinical informatics, nursing informatics and biomedical informatics use technology and data to assist and improve healthcare services.



21

Nutrition informatics

- The effective retrieval, organization, storage and optimum use of information, data and knowledge for food and nutrition-related problem solving and decision-making



22

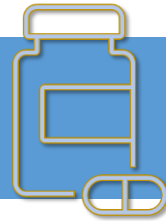
Pharmacy Informatics



The scientific field that focuses on medication-related data and knowledge within the continuum of healthcare systems - including its acquisition, storage, analysis, use and dissemination - in the delivery of optimal medication-related patient care and health outcomes

23

Pharmacy Informatics examples



- Development of decision support systems for prescribing medicine
- Automating the process of verification and billing of the medication, for example, once the medication is prescribed by the physician it is automatically checked for side effects, duplication, and permission by the insurance company before dispensing
- Example: <https://www.wolterskluwer.com/en/solutions/medispan>

24

Health Informatics applications

Telemedicine

Telehealth

Personal
health Apps

PHR Apps

25

1) Telemedicine

Telemedicine is the use of advanced telecommunications technologies for the purposes of making diagnoses, conducting research, transferring patient data, and/or improving disease management and treatment in remote areas.

Telemedicine is a way to access healthcare appointments with doctors, or nurses on the internet using your phone or computer. These appointments are usually video calls through an app or platform.



26

1) Telemedicine (cont.)

The idea of telemedicine isn't to replace clinic visits with a doctor. Instead, they should complement regular healthcare.

People may use telemedicine to:

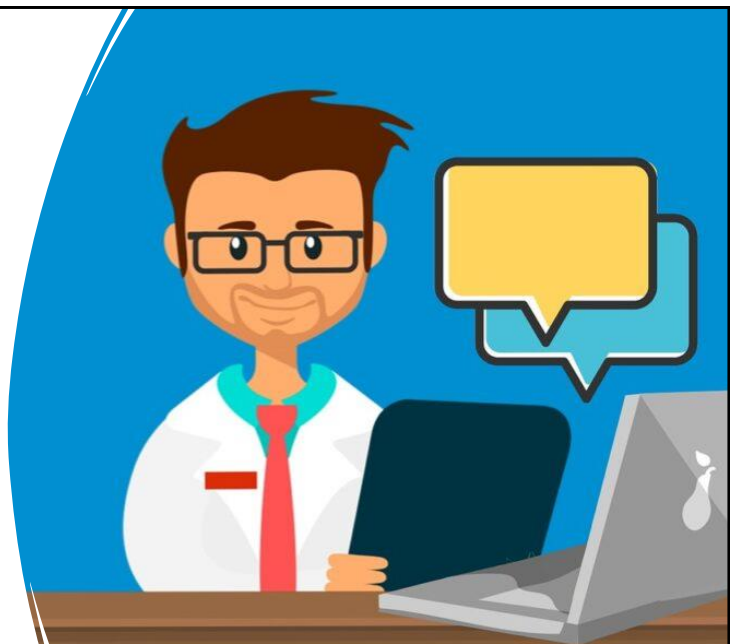
- talk with a doctor and see if you need a physical appointment .
- request or renew certain prescriptions for medications .
- assess and treat minor health conditions
- access therapy and other mental health services .



17

2) Telehealth

- Telehealth is the use of digital information and communication technologies to access health care services remotely and manage your health care.
- Technologies can include computers and mobile devices, such as tablets and smartphones.



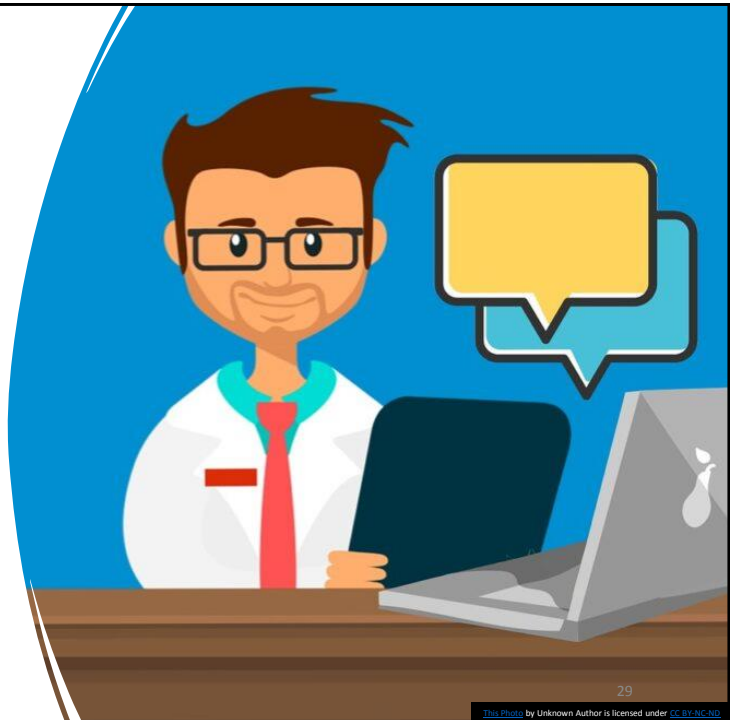
28

This Photo by Unknown Author is licensed under CC BY-NC-ND.

2) Telehealth

Telehealth goals:

1. Make health care easier to get for people who live in communities that are remote or in the country.
2. Keep you and others safe if you have an infectious disease such as COVID-19.
3. Make services more easily offered or handy for people who have limited ability to move, time or transportation.
4. Offer access to medical specialists



3) Personal health Apps

- Many apps have been made to help people better organize their medical information in one secure place.
- These digital tools may help you to:



01

Store personal health information.

03

Record vital signs.

04

Calculate and track your calories.

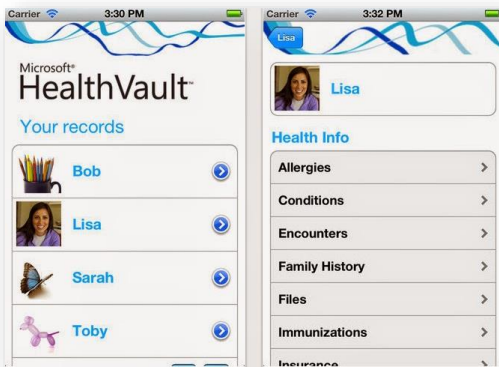
05

Schedule reminders for taking drugs.

06

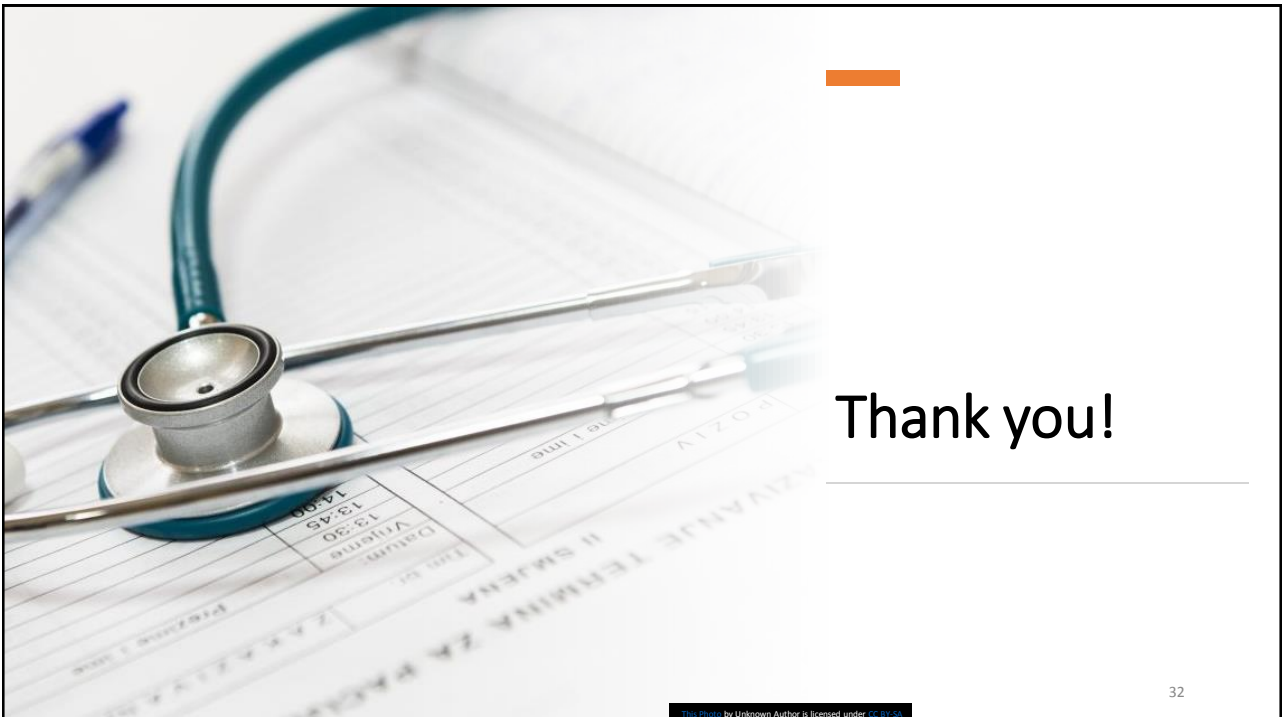
Record physical activity such as your daily step count.

4) Personal health records (PHR)



- An **electronic personal health record system (PHR system)** is a collection of information about your health that you control and maintain.
- A PHR App is easy for you to see anytime via a web-enabled device, such as your computer, laptop, tablet or smartphone.
- A PHR also allows you to review your lab results, X-rays and notes from your provider.

31



Thank you!

32