COMPUTER SOFTWARE

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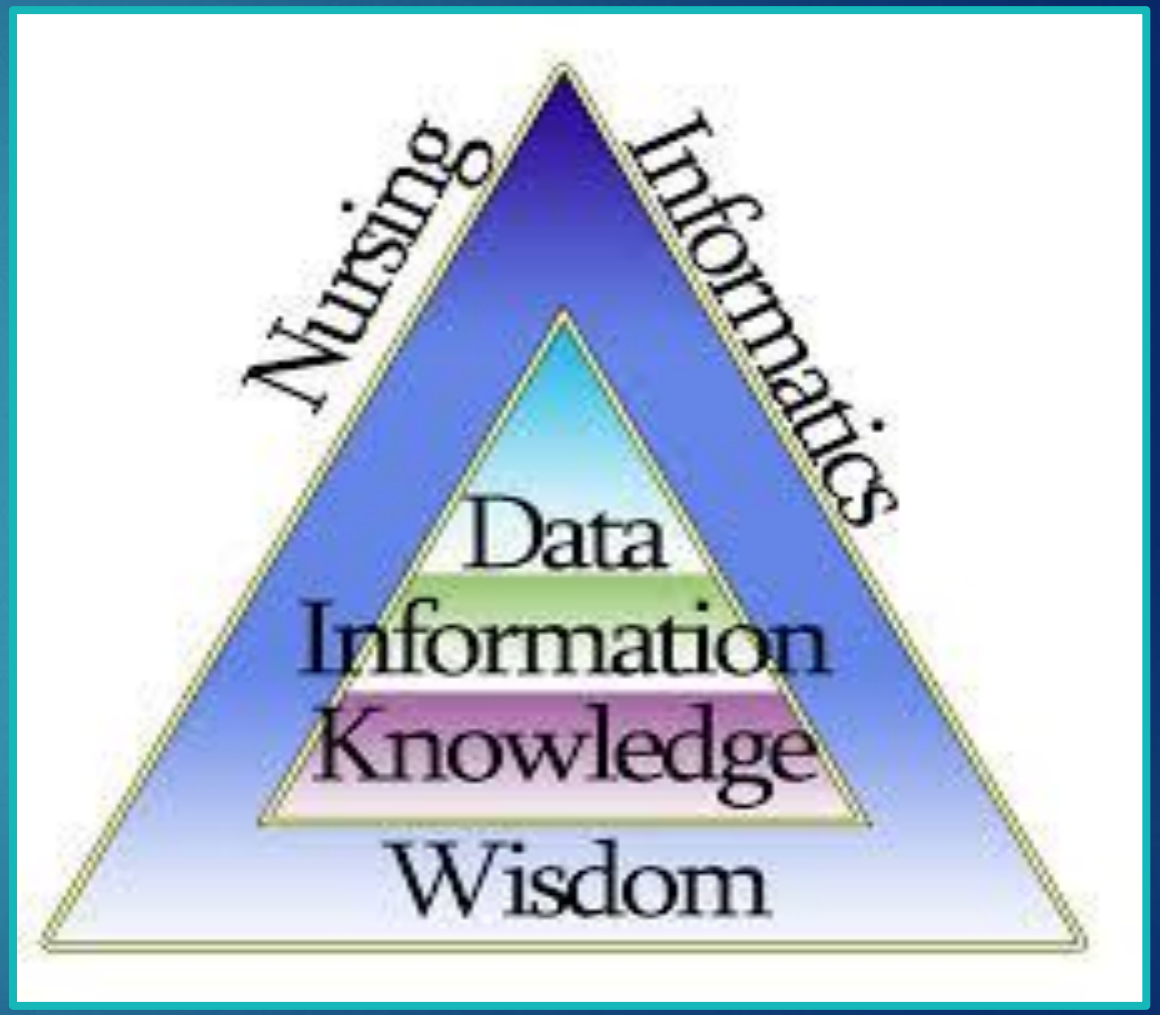
What Is Nursing Informatics?

"A specialty that integrates nursing science with multiple information and analytical sciences to identify, define, manage, and communicate data, information, knowledge, and wisdom in nursing practice."

DIKW Paradigm



Metastructures of Nursing Informatics

- **Data:** discrete entities that are described objectively without interpretation
- **Information**: Data that are interpreted, organized, or structured
- **Knowledge:** Information that is synthesized to identify and formalize relationships
- **Wisdom:** Application of knowledge to the management and solution of human problems

An Example of DIKW

- **Data:** A patient's vital signs
- **Information**: A serial set of vital signs, placed into a context and used for longitudinal comparisons
- **Knowledge**: Recognition of a pattern and identification of interventions
- **Wisdom:** Accuracy of the synthesis of information and appropriate selection of interventions

Data vs. Information

- Data – Raw facts
- Information - Processed data that have meaning.
  - For information to be valuable or meaningful, it must be accessible, accurate, timely, complete, cost effective, flexible, reliable, relevant, simple, verifiable, and secure.

From Knowledge to Wisdom

- Knowledge focuses on what is known.
- Wisdom focuses on the appropriate application of that knowledge.
- Example:
  - A knowledge base may include several options for managing an anxious family, while wisdom would guide the decisions about which of these options are most appropriate with a specific family.

Use of Knowledge

- All nurses have the opportunity to be involved in the formal dissemination of knowledge via their participation in professional conferences, as either presenters or attendees.
- All nurses, regardless of the practice arena, must use informatics and technology to inform and support that practice.

Knowledge Viability

- Refers to technology-based applications that offer easily accessible, accurate, and timely information obtained from a variety of resources and methods and presented in a manner as to provide us with the necessary elements to generate new knowledge

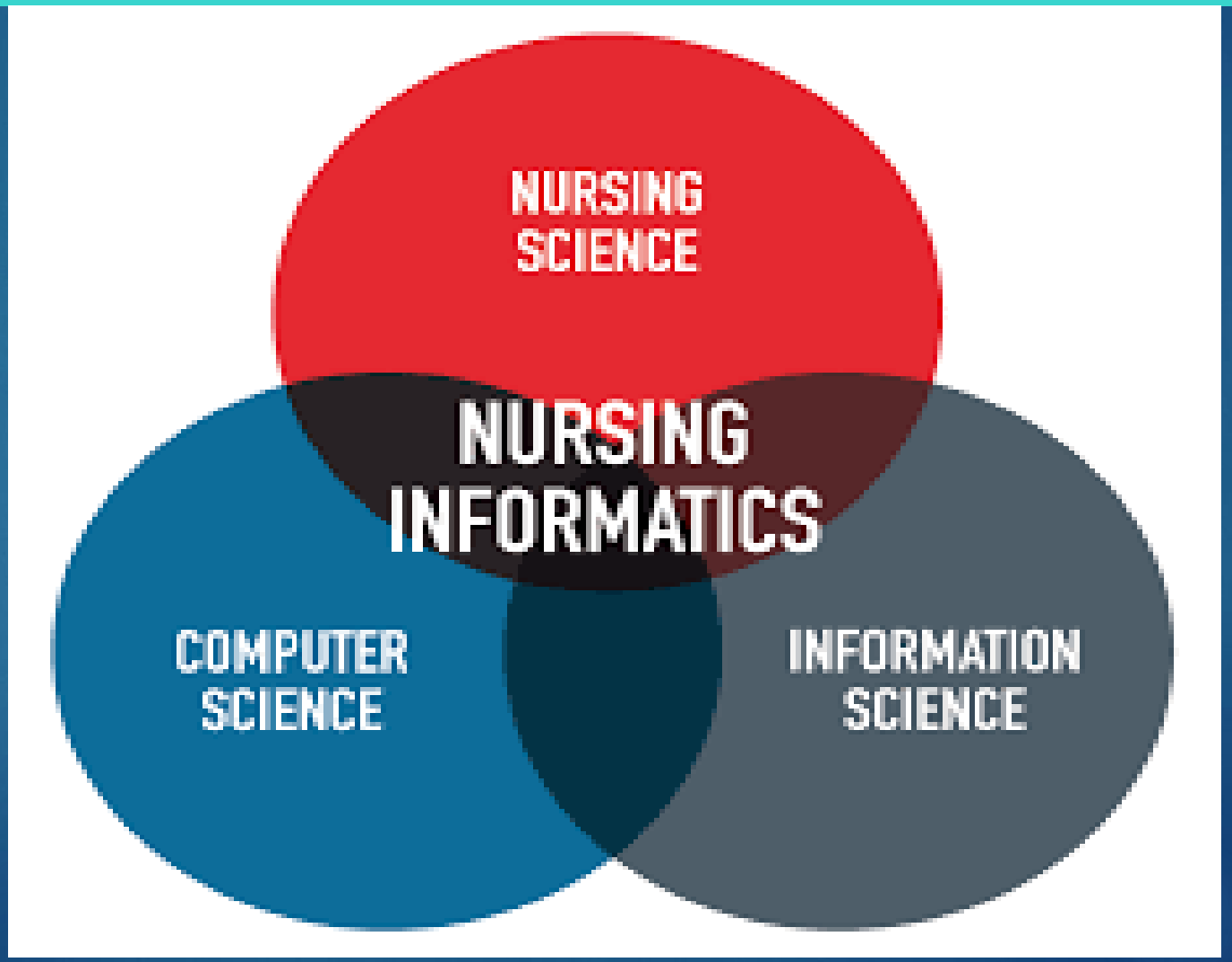
Wisdom in Informatics

- The ability of the system to evaluate the documentation drawn from a health information system, and to adapt or change the system to improve the workflow of the clinical nurse
- Nurses' decision making is described as an array of decisions that include specific behaviors, as well as cognitive processes surrounding a cluster of issues.
- Can any aspect of nursing wisdom be automated?

Use of Wisdom

- Wisdom is the application of knowledge to an appropriate situation.
- In the practice of nursing science, we expect action and or actions directed by wisdom.
- Wisdom is developed through knowledge, experience, insight, and reflection.

Nursing Science and the Foundation of Knowledge Model



Building Blocks of Nursing Informatics

- Nursing science
- Information science
- Computer science
- Cognitive science

Nursing Science and Informatics

- What is nursing informatics?
  - One widely accepted is that it is a combination of nursing science, information science, and computer science (and we add cognitive science).
- Nursing science as a building block of nursing informatics
- One of the most frequently quoted and widely accepted definitions of nursing informatics is that it is a combination of nursing science, information science, and computer science.

Use of Knowledge

- Individuals have an amazing ability to manage knowledge. This ability is learned and honed from birth.
- We experience our environment and learn by acquiring, processing, generating, and disseminating knowledge

Nursing and Knowledge

- **Nurses are:**
  - **Knowledge workers**
    - Working with information and generating information and knowledge as a product
  - **Knowledge acquirers**
    - Providing convenient and efficient means of capturing and storing knowledge
  - **Knowledge users**
    - Benefiting from valuable, viable knowledge

Nursing and Knowledge

- **Nurses are:**
  - **Knowledge engineers**
    - Designing, developing, implementing, and maintaining knowledge
  - **Knowledge managers**
    - Capturing and processing collective expertise and distributing it where it can create the largest benefit
  - **Knowledge developers or generators**
    - Changing and evolving knowledge based on the tasks at hand and information available

Information Science

- The science of information
- Study of the application and use of information and knowledge in organizations and the interfacings or interaction between people, organizations, and information systems
- Information science enables the processing of information

Information Processing

- Information science and computational tools are extremely important in enabling the processing of data, information, and knowledge in health care

Information System

- Combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data, typically in organizational settings
- Acquires data or inputs
- Processes data that consist of the retrieval, analysis, and/or synthesis of data
- Disseminates or outputs in the form of reports, documents, summaries, alerts, prompts, and/or outcomes
- Can disseminate, provide feedback, and adjust the data and information based on these dynamic processes

Cognitive Science

- Interdisciplinary field that studies the mind, intelligence, and behavior from an information processing perspective
- Provides the scaffolding for the analysis and modeling of complicated, multifaceted human performance
  - Has tremendous effect on issues impacting informatics
  - End user is the focus; in nursing, the end user could be clinician providing patient care.

Cognitive Informatics (CI)

- According to Wang (2003), CI is an emerging transdisciplinary field that attempts to bridge the gap of understanding how information is processed in the mind and in the computer.
- Computing and informatics theories can be applied to help understand the information processing of the brain
- Cognitive and neurologic sciences can be applied to build more efficient computer processing systems.

Artificial Intelligence (AI)

- AI deals with the conception, development, and implementation of informatics tools based on intelligent technologies.
- It attempts to capture the complex processes of human thought and intelligence.

Sub-fields of NI:

- **Personal Informatics** - collect personally relevant information for the purpose of self-reflection and self-monitoring.
- **Professional Informatics**
- **Educational Informatics**

Summary

- Nurses must use their wisdom and make informed, judicious, prudent, and intelligent decisions while enacting care.
- Cognitive science, cognitive informatics, and artificial intelligence will continue to evolve to help us build knowledge and wisdom.

Legislative Aspects of Nursing Informatics: HITECH AND HIPAA

- Describe the purposes of the **Health Information Technology for Economic and Clinical Health** (HITECH) Act of 2009.
- Explore how the HITECH Act is enhancing the security and privacy protections of the **Health Insurance Portability and Accountability Act** (HIPAA) of 1996.

Basic Types of SOFTWARE:

- System
- Utility
- Applications

System Software

- System software “boots up” (starts up and initializes) the computer system:

a. It controls input, output, and storage

b. It controls the operations of the application software

- Basic Input/output System (BIOS): The first level of system control is handled by the BIOS stored on a ROM chip on the motherboard (firmware)

Vivadifferences.com

System Software

- Operating system

a. An operating system is the overall controller of the work of the computer.

b. The OS is software loaded from the hard drive into RAM as soon as the computer is turned on.

System Software

- The OS:

(1) Manages the interfaces to all peripheral hardware

(2) Schedule tasks

(3) Allocates storage in memory and on disks

(4) Retrieves programs and data from storage

(5) Provides an interface between the machine and the user

Utility Software

- Utility programs includes programs designed to keep the computer system operating efficiently.
- They do this by:

  a. Adding power to the functioning of the system software

  b. Supporting the operating system or applications software programs

Utility Software

- Six types of utility software can describe the majority of utility programs:
  a. Security software
  b. Disk management utilities
  c. Backup utilities
  d. Screen savers
  e. Archival software
  f. Programming environment support programs


Del
Deleting data
Disk defragmentation
User accounts and security
Anti-virus software
Software updates
System cleanup
Encryption/ decryption
Formatting


KASPERSKY
ANTI-VIRUS
AVG
McAfee
bitdefender
secure your every bit
F-Secure
INTERNET
SECURITY
SUITE
2010
Microsoft
Security Essentials
avast!
be free
AVIRA
eset
NOD32
antivirus

Application Software

- Application software includes the various programs which users require to perform day-to-day tasks.
- Includes all the various programs people use to:
  a. Do the work
  b. Process data
  c. Play games
  d. Communicate with others
  e. Watch videos and multimedia programs


Entanglement Web App


Word Online


Gmail


Gmail Offline


Google Docs

Mobile Website Builder


Outlook.com


Google Drive

Box


FollowMania


YouTube

Daum Equation Editor


Zoho Wiki

Photo Book

PDF to Word Converter...


SnapPages


Sticky Notes

SAPOmobile

Hospital Information System (HIS)

- Hospitals usually have a large information called a Hospital Information System (HIS) or Hospital Information Technology System (HITS)
- These systems include most of the business applications needed, such as:

  (1) Billing, (2) Payroll, (3) Budget management

  (4) Inventory control, (5) Personnel applications

Hospital Information System (HIS)

- They also include:
  - (1) Clinical and semi-clinical systems
  - (2) The electronic medical record (EMR)

Hospital Information System (HIS)

- The components nurses use most include
  - (1) The electronic medical record
  - (2) Admission-discharge-transfer (ADT) systems
  - (3) Medication administration record (MAR) software
  - (4) Supplies inventory systems
  - (5) Laboratory systems
  - (6) Radiology system
  - (7) Computerized patient acuity system
  - (8) E-mail system

SPIGOT SOFTWARE
PURSUING PERFECTION

Hospital Information System

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Open Source and Free Software

Free Software

Free software is defined by the FSF in terms of four freedoms for software users:

a. To have the freedom to use

b. Study

c. Redistribute

d. Improve the software

Open Source Software

Open source concept is said:

a. To promote software reliability and quality by supporting independent peer review

b. Rapid evolution of source code

c. As well as making the source code of software freely available

OSS/FS Applications

Many OSS/FS alternatives exist to more commonly known applications:

a. Operating system

b. Web browser

c. E-mail client

d. Word processing or integrated office suite

e. Presentation tools


OpenOffice.org
fedora
blender
mozilla
Firefox
Linux
php
MySQL
debian
Java
WordPress
Apache
ubuntu

Examples of OSS/FS Applications:

- Operating Systems: GNU/Linux
- Web Browser and Server: Firefox and Apache
- Word Processing or Integrated Office Suite: OpenOffice
- OSS/FS Healthcare Applications: Indivo, SMART platforms project, GNUMed, OpenMRS

Thank You!

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