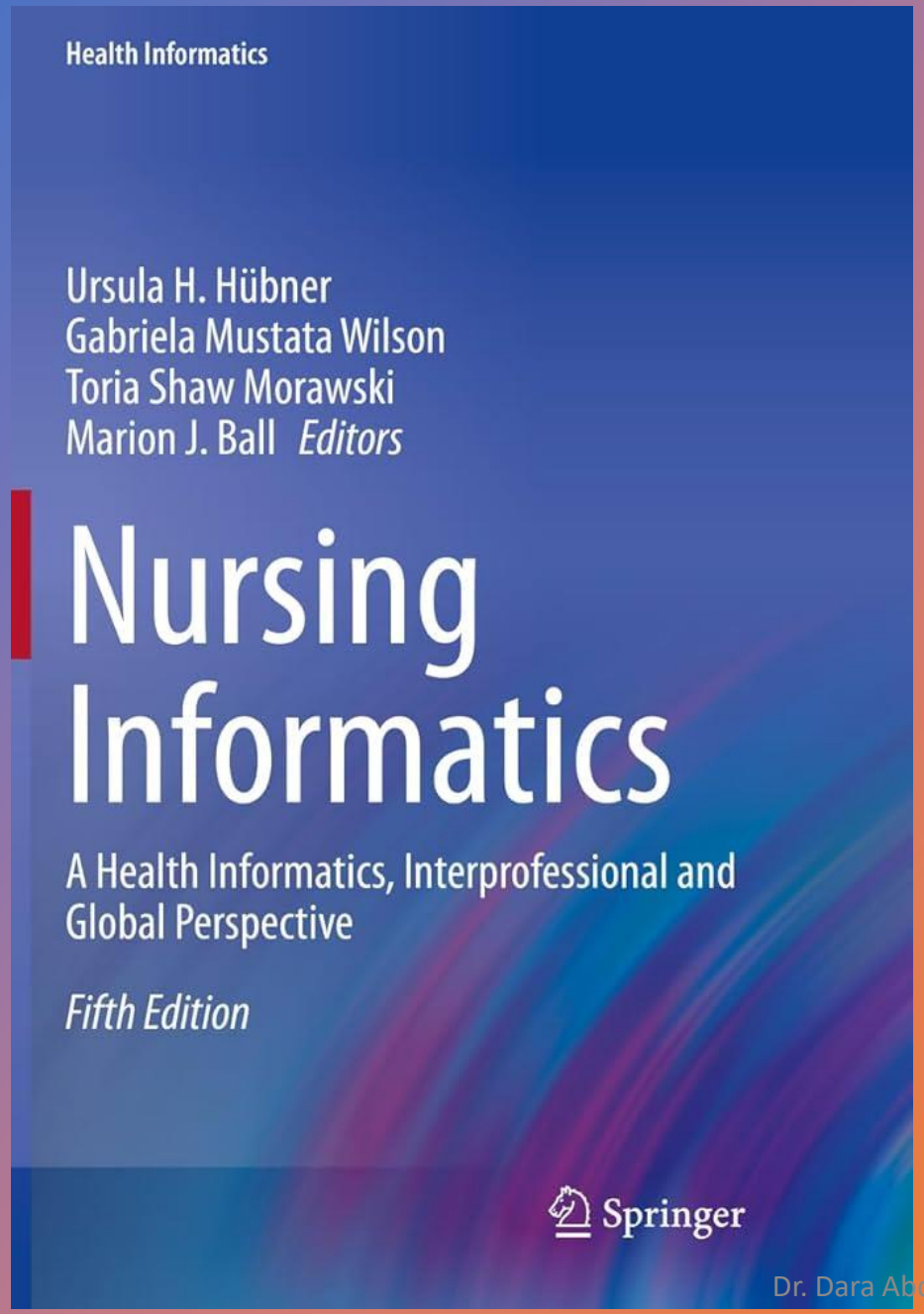

1. Nursing Informatics Course

Nursing Science and Concepts of Knowledge

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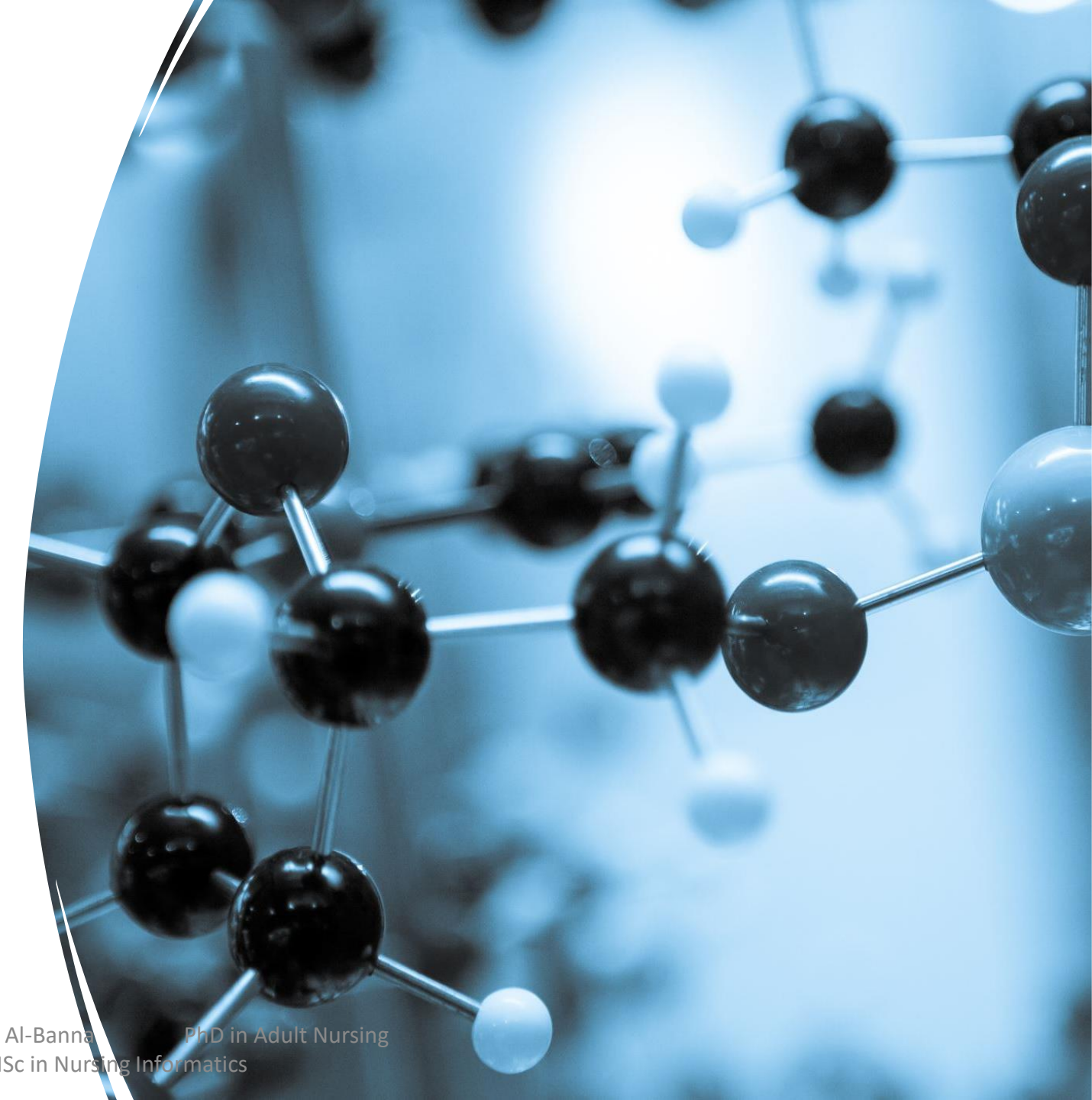
Nursing informatics (NI)

- **Nursing informatics (NI)** has been traditionally defined as a specialty that integrates **nursing science**, **computer science**, and **information science** to manage and communicate data, information, knowledge, and wisdom in nursing practice.
- Nursing science as one of the **building blocks** of NI.
- As depicted in the **Figure**, the traditional definition of NI is extended in this text to include cognitive science.



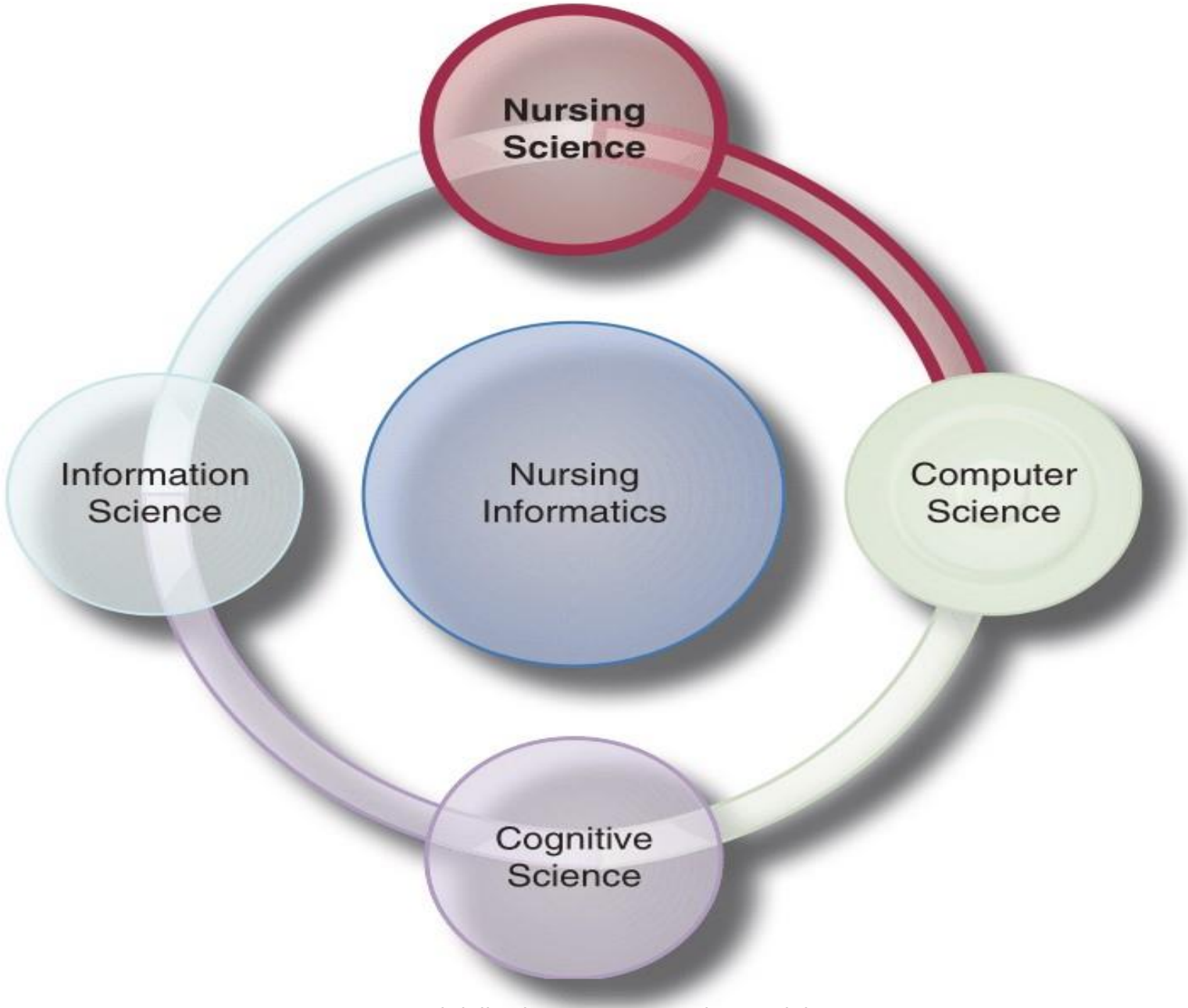


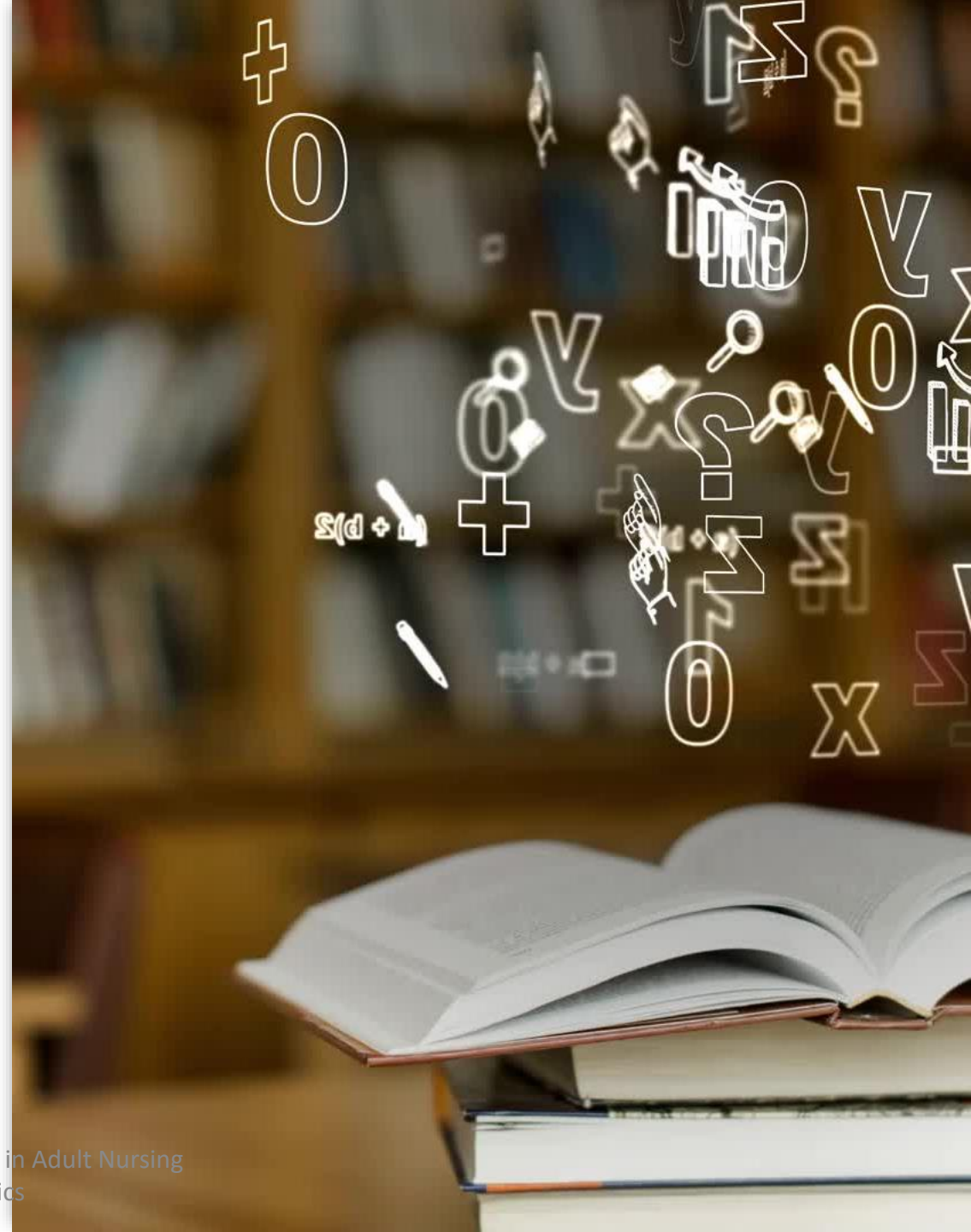
Figure 1-1 Building Blocks of Nursing Informatics

- Manage equipment and perform procedures; the interpersonal skills to interact appropriately with people; and the cognitive skills to observe, recognize, collect, analyze, and interpret data to reach a reasonable conclusion, which forms the **basis of a decision**.
- At the heart of all of these above skills lies the management of data and information.

- **Nursing science** focuses on the ethical application of knowledge acquired through education, research, and practice to provide services and interventions to patients to maintain, enhance, or restore their health and to acquire, process, generate, and disseminate nursing knowledge to advance the nursing profession.

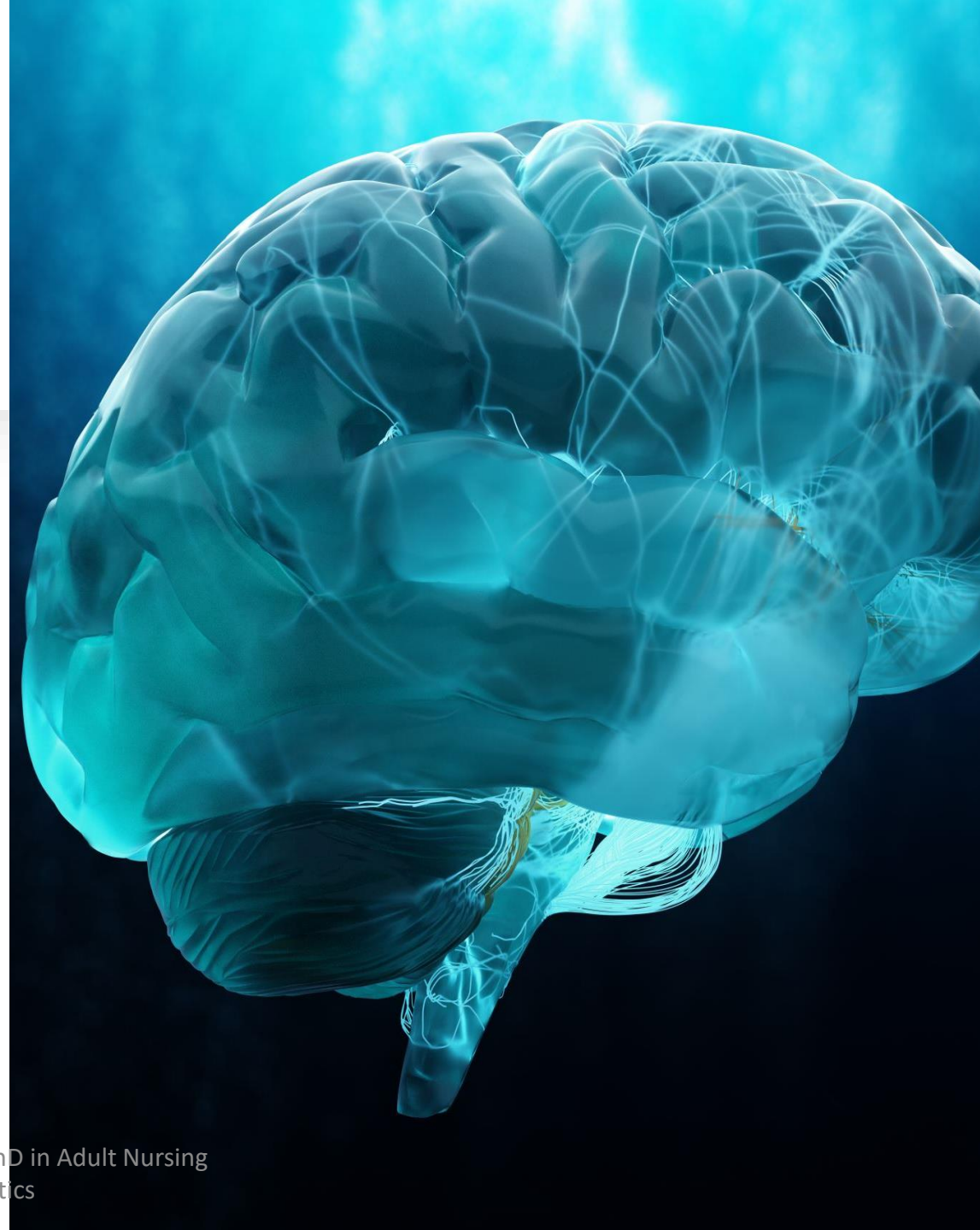
Concepts of Knowledge

- **Knowledge** is the awareness and understanding of a set of information and ways that this information can be made useful to support a specific task or arrive at a decision.



Concepts of Knowledge

- Humans acquire data and information in bits and pieces and then transform the information into knowledge.
- The information-processing functions of the brain are frequently compared to those of a computer and vice versa
- Humans can be thought of as organic information systems that are constantly acquiring, processing, and generating information or knowledge in their professional and personal lives.
- They have an amazing ability to manage knowledge. This ability is learned and honed from birth as individuals make their way through life interacting with the environment and being inundated with data and information.
- Each person experiences the environment and learns by acquiring, processing, generating, and disseminating knowledge.



Foundation of Knowledge Model

- At its base, the model contains **bits**, **bytes** (computer terms used to quantify data), **data**, and **information** in a random representation.
- Growing out of the base are separate cones of light that expand as they reflect upward; these cones represent knowledge acquisition, knowledge generation, and knowledge dissemination.
- Encircling and cutting through the knowledge cones is **feedback**, which acts on and may transform any or all aspects of knowledge represented by the cones.

- Knowledge acquisition, knowledge generation, knowledge dissemination, knowledge processing, and feedback are constantly evolving for nursing professionals.

- The transparent effect of the cones is deliberate and intended to suggest that, as knowledge grows and expands, its use becomes more transparent, meaning people use this knowledge during practice without even being consciously aware of which aspect of knowledge they are using at any given moment.

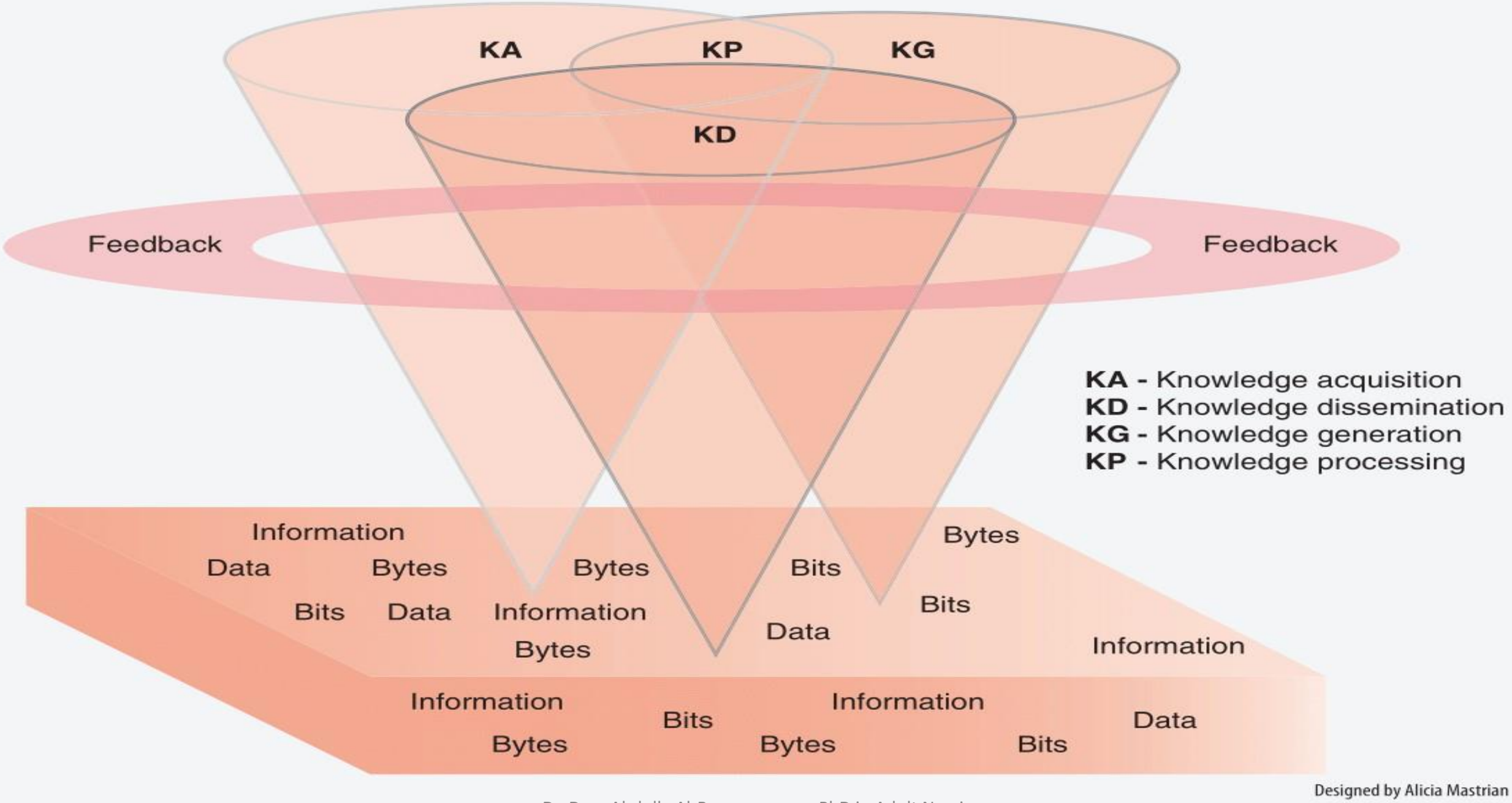
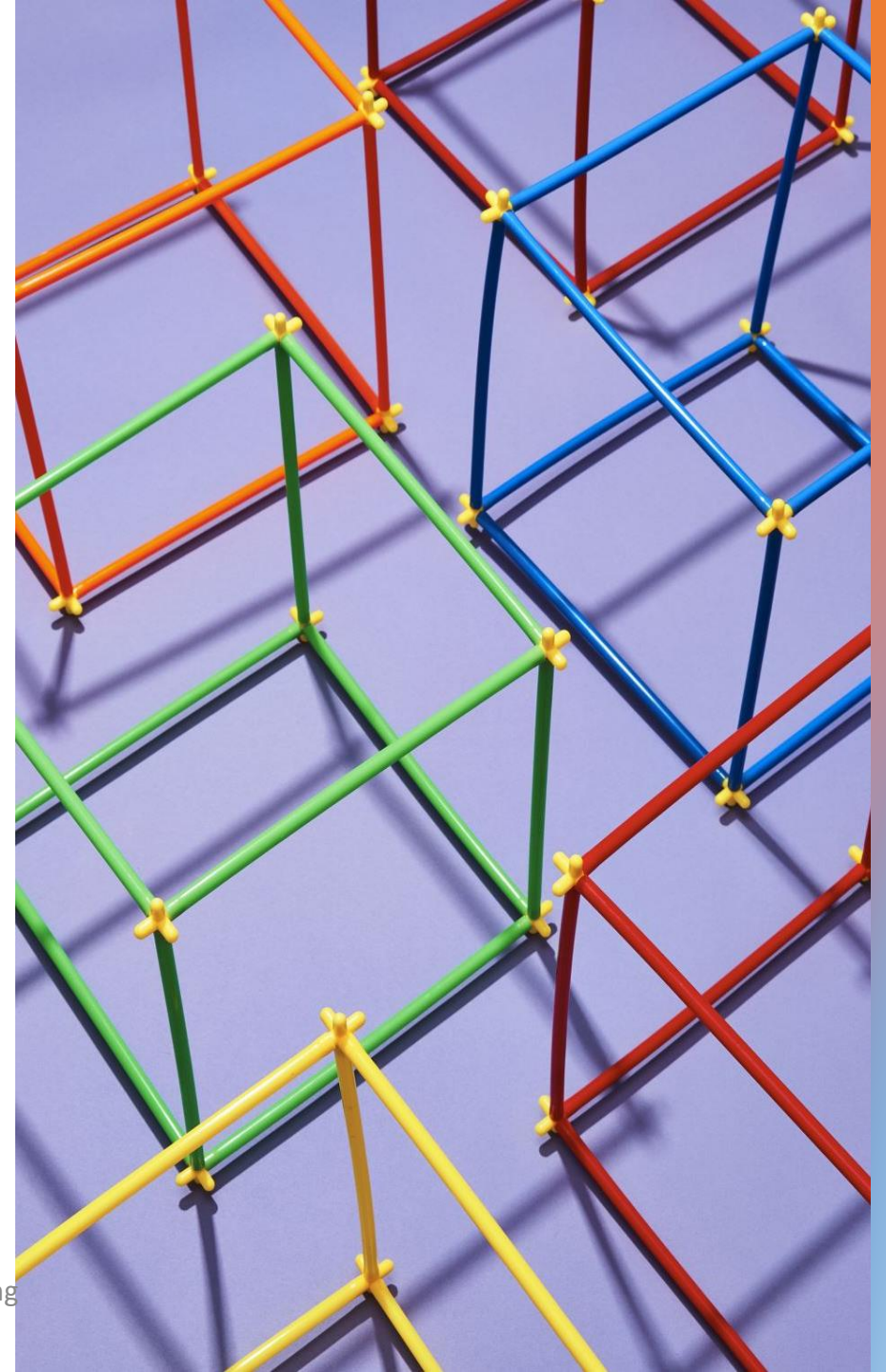


Figure I-1 Foundation of Knowledge Model

- The Foundation of Knowledge model is not perfect, and others have developed models of knowledge that are more complex. For example, Evans and Alleyne (2009) constructed the knowledge domain process (**KDP**) model to represent knowledge construction and dissemination in an organization. Yet they caution as follows:

- The **KDP model**, like all models, is an abstraction aimed at making complex systems more easily understood. While the model presents knowledge processes in a structured and simplified form, the nature and structure of the processes themselves may be open to debate.

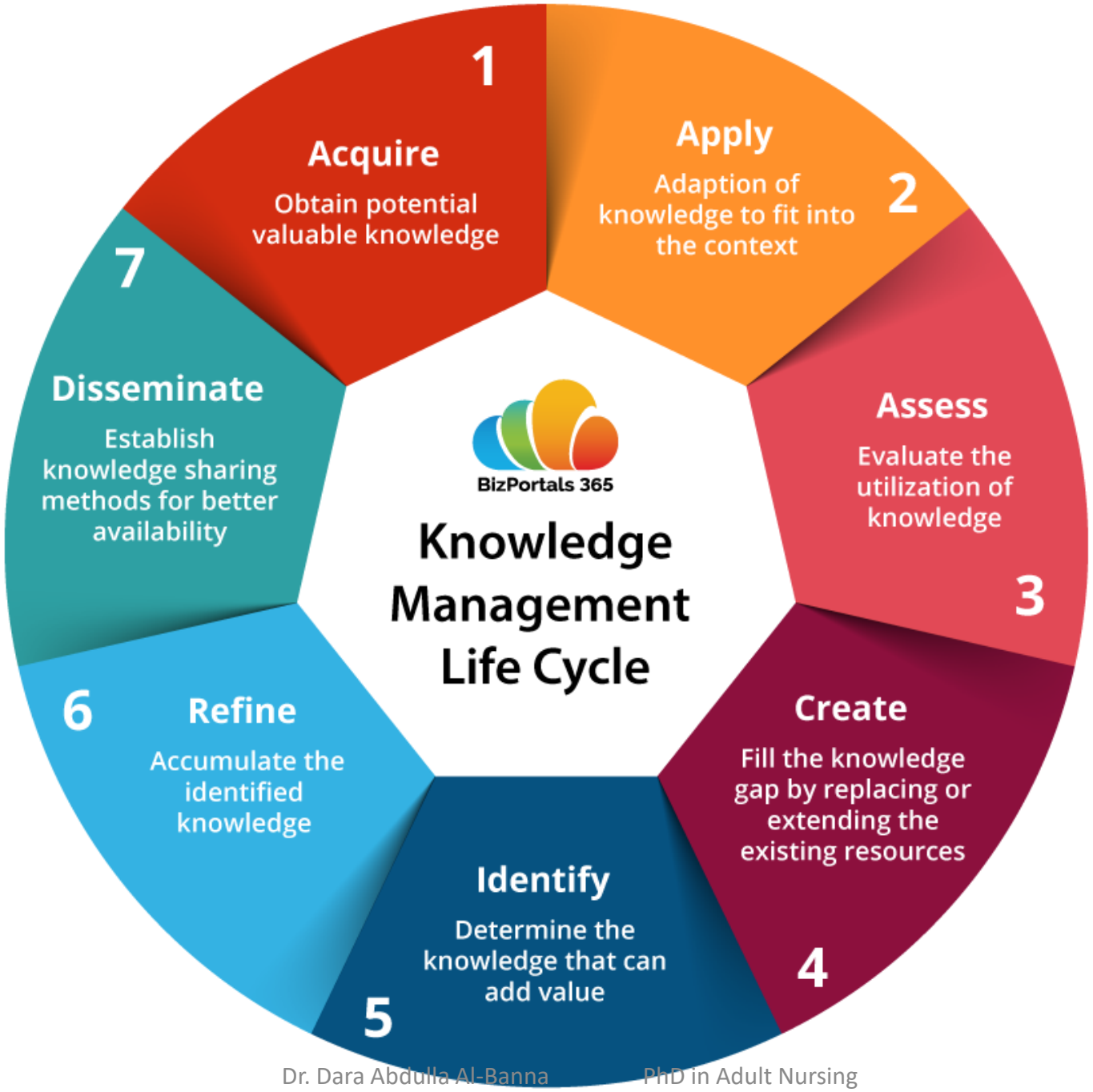


Knowledge Management (KM)

- Knowledge Management undertakes to identify what is in essence a human asset buried in the minds and hard drives of individuals working in an organization.

Knowledge management also requires a **system** that will allow the creation of new knowledge, a dissemination system that will reach every employee, with the ability to package knowledge as value-added in products, services and systems.

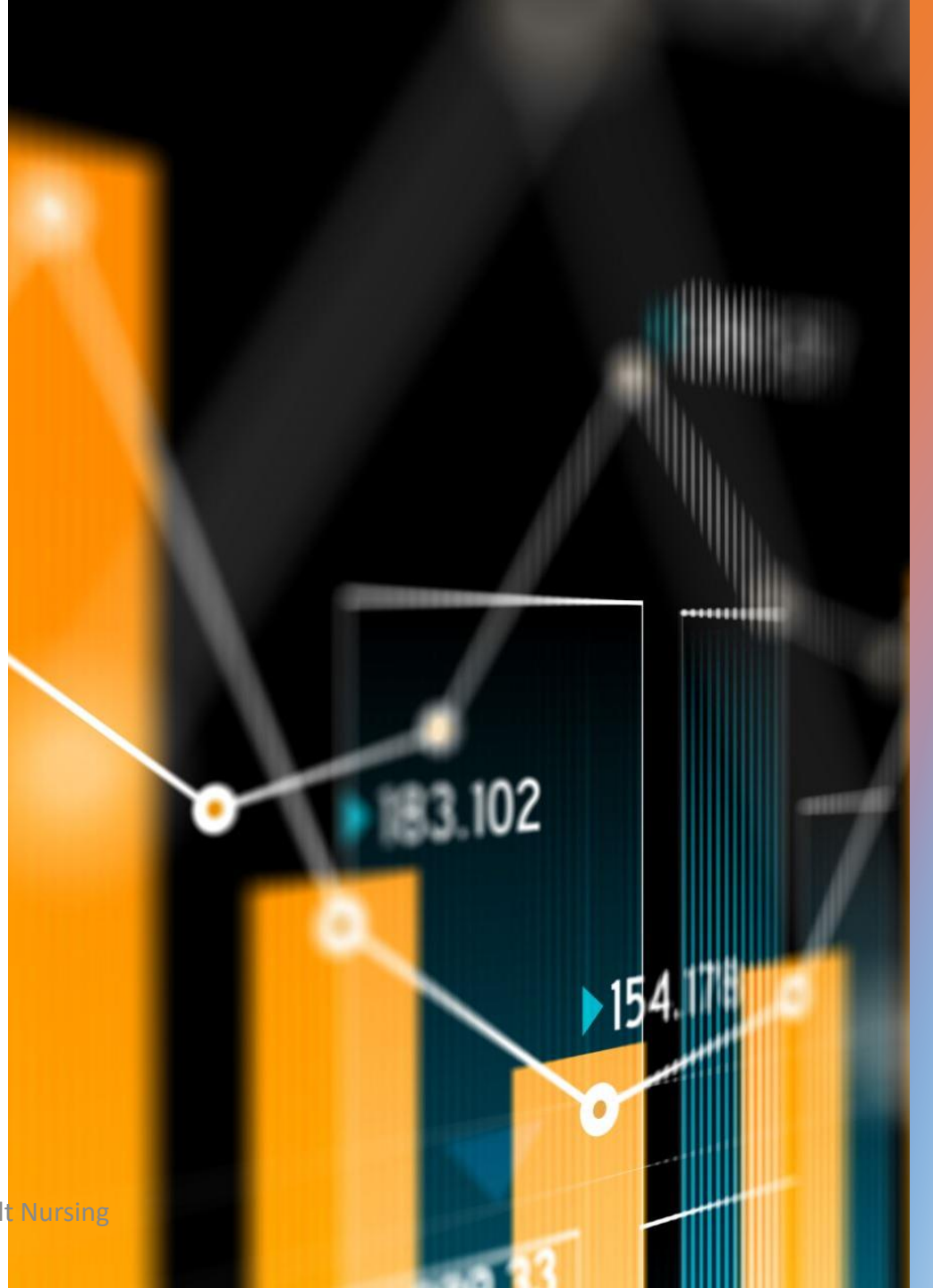
Note the informatics tools that are integral to knowledge management, particularly in its knowledge **dissemination**, knowledge **development**, and knowledge **processing aspects**.


1
Acquire
Obtain potential valuable knowledge
Apply
Adaption of knowledge to fit into the context
2
Assess
Evaluate the utilization of knowledge
3
Create
Fill the knowledge gap by replacing or extending the existing resources
4
Identify
Determine the knowledge that can add value
5
6
Refine
Accumulate the identified knowledge
7
Disseminate
Establish knowledge sharing methods for better availability
BizPortals 365
Knowledge Management Life Cycle

What does a nurse do?

Nurses are knowledge workers

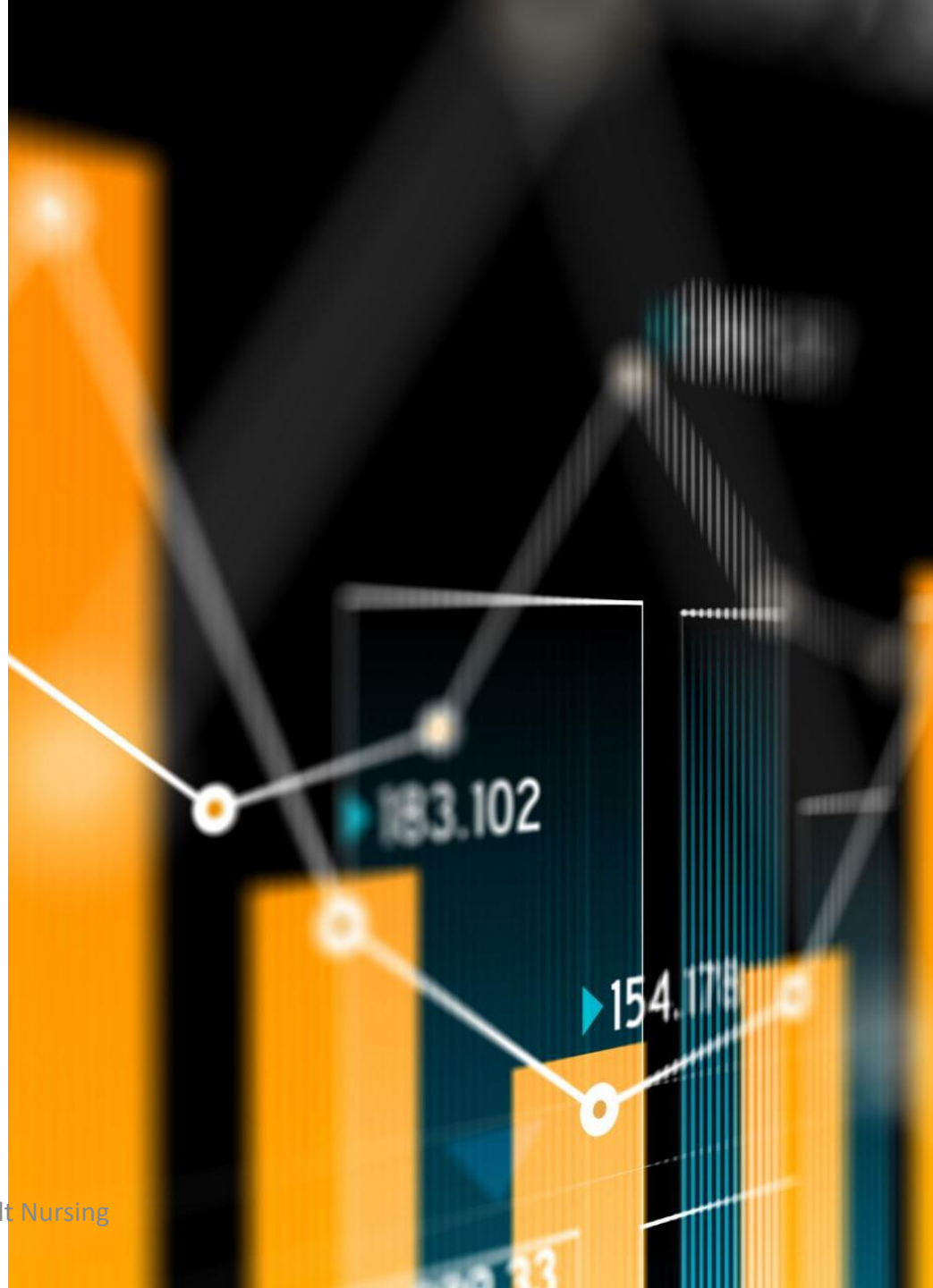
- **In the case scenario**, Tom relied on the immediate data and information that he acquired during his initial rapid assessment to deliver appropriate care to his patient.
- Tom used accessible, accurate, timely, relevant, and verifiable data and information.
- He compared that data and information to his knowledge base of previous experiences to determine which data and information were relevant to the current case.



- He compared that data and information to his knowledge base of previous experiences to determine which data and information were relevant to the current case.

- By applying his previous knowledge to data, he converted those data into information and information into new knowledge, that is, an understanding of which nursing interventions were appropriate in this case.

- Thus, information is data made functional through the application of knowledge.



- In the previous scenario, Tom also used technology (a pulse oximeter and a heart monitor) to assist with and support the delivery of care.

- What is not immediately apparent, and some would argue is **transparent** (done without conscious thought), is the fact that, during the rapid assessment, Tom reached into his knowledge base of previous learning and experiences to direct his care so that he could act with transparent wisdom.

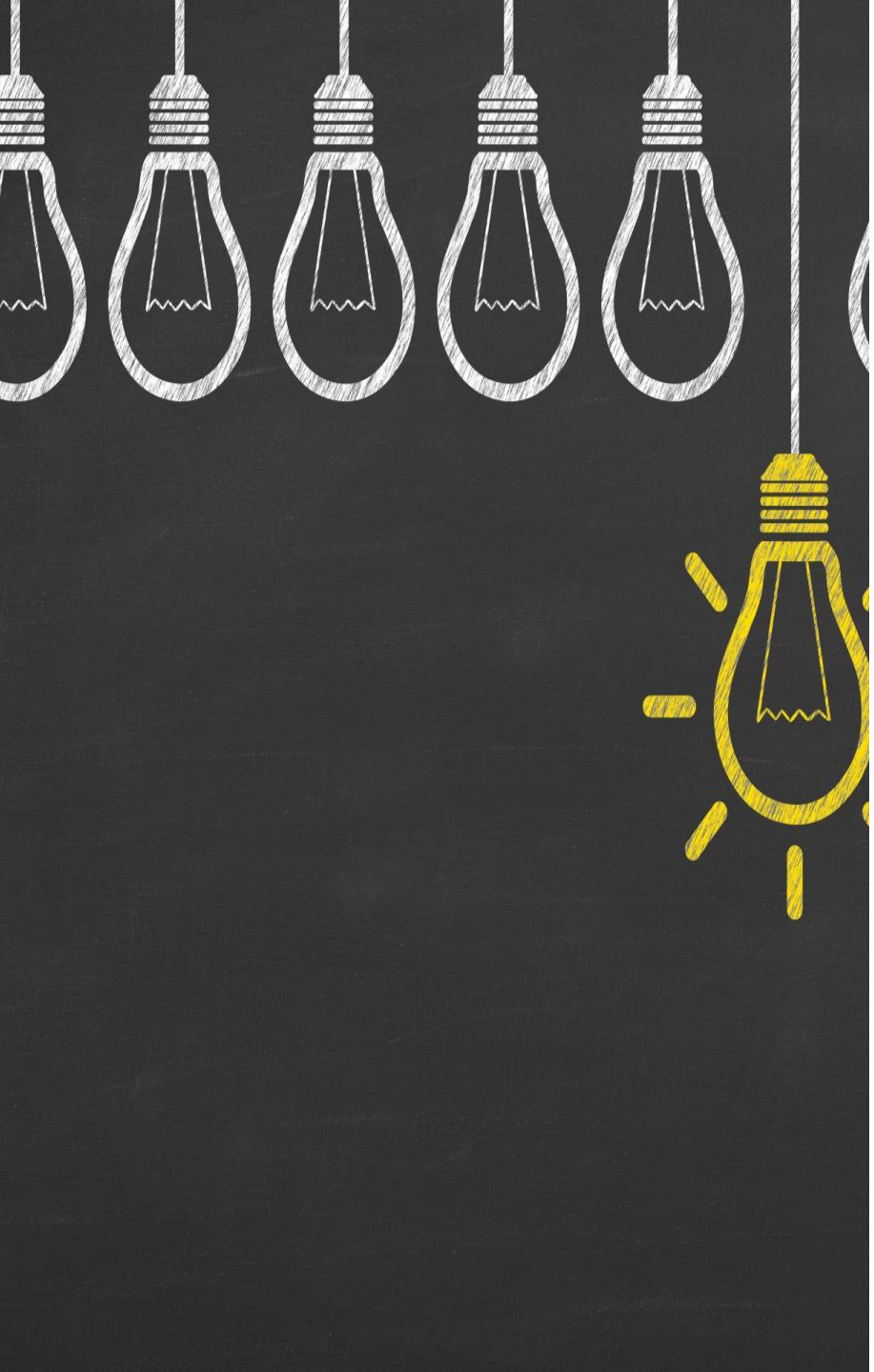
- He used both **nursing theory** and **borrowed theory** to inform his practice.

- Tom certainly used nursing process theory, and he may have also used one of several other nursing theories, such as Rogers's science of unitary human beings, Orem's theory of self-care deficit, or Roy's adaptation theory.

- In addition, Tom may have applied his knowledge from some of the basic sciences, such as anatomy, physiology, psychology, and chemistry, as he determined the patient's immediate needs.

- Information from Maslow's hierarchy of needs, Lazarus's transaction model of stress and coping, and the health belief model may have also helped Tom practice professional nursing.

- Tom illustrates the practical aspects of nursing science.



- Tom acquired knowledge in his basic nursing education program and continues to build his foundation of knowledge by engaging in such activities as reading 1. nursing research and theory articles, 2. attending continuing education programs, 3. consulting with expert colleagues, 4. using clinical databases and clinical practice guidelines.

- As he interacts in the environment, he acquires data that must be processed into knowledge.

- This processing effort causes him to redefine and restructure his knowledge base and generate **new knowledge**.

- Tom can then **share (disseminate)** this new knowledge with colleagues, and he may receive feedback on the knowledge that he shares.
- This dissemination and feedback build the knowledge foundation anew as Tom acquires, processes, generates, and disseminates new knowledge as a result of his interactions.
- As others respond to his knowledge dissemination and he acquires yet more knowledge, he is engaged to rethink, reflect on, and reexplore his knowledge acquisition, leading to further processing, generating, and then **disseminating knowledge.**
- It should be clear at this point that knowledge management is a fundamental part of nursing science.
- What will become even clearer as the text unfolds is **how informatics supports knowledge management.**

So, the nurses can do the following works:

1. All nurses use data and information. This information is then converted to knowledge. The nurse then acts on this knowledge by initiating a plan of care, updating an existing one, or maintaining the status quo.
2. Nurses depend on their instructors and others to process, generate, and disseminate knowledge.
3. Nurses begin to be independently performed some of the other Foundation of Knowledge functions.

So, the nurses can do the following works:

4. They keep up with the explosion of information in nursing and health care.
5. They continue to rely on the knowledge generation of nursing theorists and researchers and the dissemination of their work.
6. Nurses are committed to lifelong learning and the use of knowledge in the practice of nursing science.

So, the nurses can do the following works:

7. Nurse can use NI applications of databases, knowledge management systems, and repositories, where this knowledge can be analyzed and reused, facilitate this process by enabling knowledge to be disseminated and recycled.
8. They must be in the habit of constantly building and rebuilding their foundation of knowledge about nursing science.
9. They develop and implement curricular innovations; they must evaluate the effectiveness of those changes.

So, the nurses can do the following works:

10. They use formal research techniques to achieve this goal and therefore generate knowledge about the best and most effective teaching strategies.
11. All nurses have the opportunity to be involved in the formal dissemination of knowledge via their participation in professional conferences, either as presenters or as attendees. science.
12. Some nurses disseminate knowledge by formal publication of their ideas.

So, the nurses can do the following works:

13. All nurses are using informatics and technology to inform and support that practice and to enhance clinical decision-making and improve patient care. The increased use of technology to enhance nursing practice, nursing education, and nursing research will open new avenues for acquiring, processing, generating, and disseminating knowledge.

- **Thank you for Listening**

- Any Questions???
- Any Comments!!!