FACULTY OF SCIENCE

Academy of Computer Science and Software Engineering	
MODULE: IT Aspects of Knowledge Management	
CODE: IT00227 / IT28x27	
CAMPUS: APK	
EXAM: JUNE 2020 EXAMINATION - SSA	

DATE: JULY 2020   SESSION: 08:00 – 10:00

ASSESSOR   MR JP Klut

INTERNAL MODERATOR

EXTERNAL MODERATOR

DURATION: 2 HOURS   MARKS: 100

NUMBER OF PAGES: 8

INSTRUCTIONS: ANSWER ALL QUESTIONS

Question 1 (10 marks)

==According to Becerra-Fernandez & Sabherwal, Knowledge is generally found in reservoirs. What are the three general knowledge reservoirs and two specific reservoirs for each of the three general reservoirs?==

Answer

1. People reservoirs
   a. individuals and
   b. groups
2. Artifact reservoirs
   a. practices,
   b. technologies, or repositories
3. Organizational entity reservoirs
   a. organizations,
   b. organizational units and
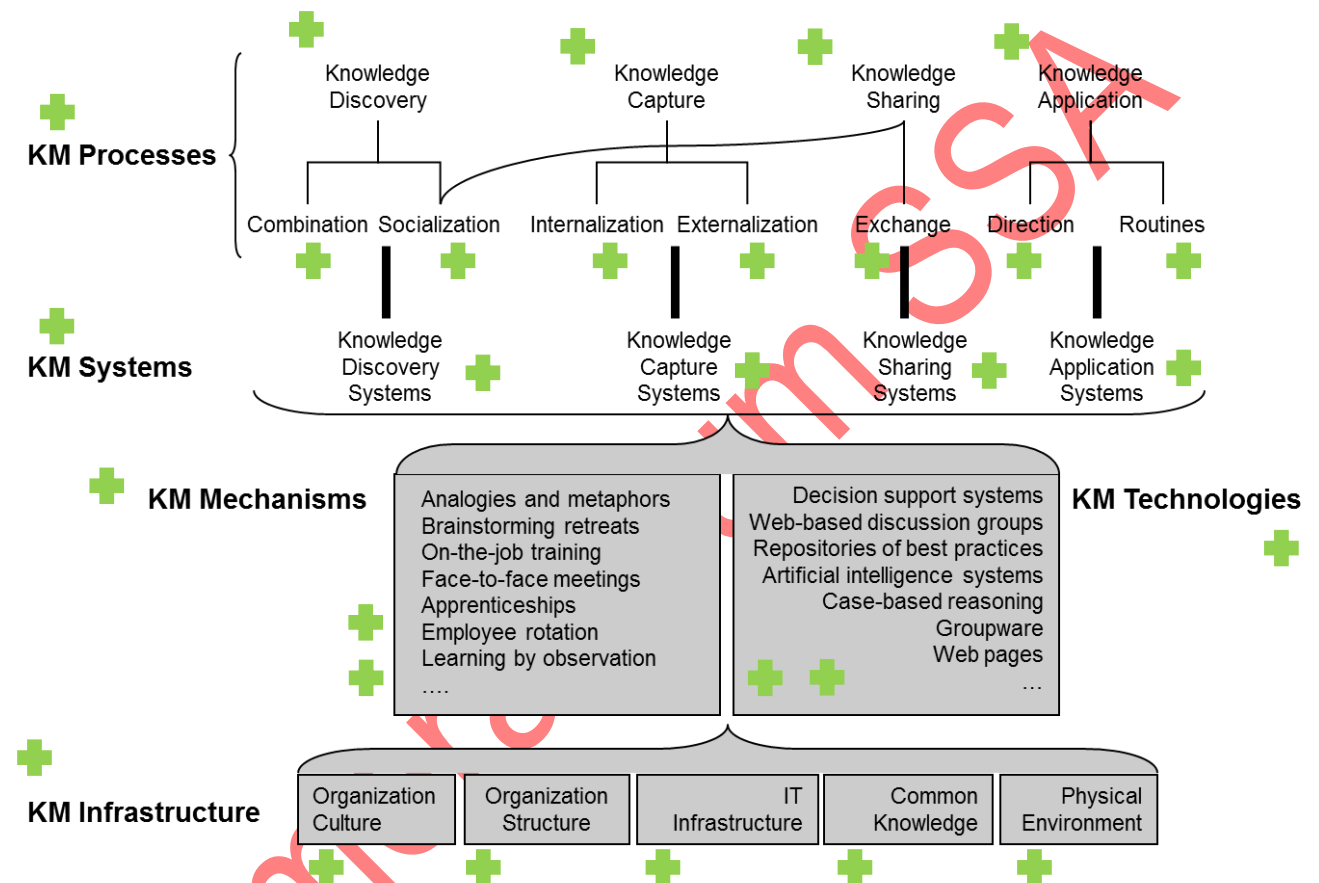   c. interorganizational networks

(10 marks) Student to list each of the 3 general and specific for each of the 3.

Question 2 (30 marks)

You have completed a study of the maturity of KM in the industry and your conclusion has been that most organizations do not approach KM in a holistic manner. You have decided that as part of your Masters thesis you will describe a framework referencing what elements organizations need to consider in formulating a KM strategy.

Using a diagram, portray the different levels of a holistic KM framework and name each level, its components and its attributes.

Answer

KM Processes

Knowledge Discovery	Knowledge Capture	Knowledge Sharing	Knowledge Application
Combination	Socialization	Internalization	Externalization	Exchange	Direction	Routines

KM Systems

Knowledge Discovery Systems | Knowledge Capture Systems | Knowledge Sharing Systems | Knowledge Application Systems

KM Mechanisms

Analogies and metaphors
Brainstorming retreats
On-the-job training
Face-to-face meetings
Apprenticeships
Employee rotation
Learning by observation
….

KM Technologies

Decision support systems
Web-based discussion groups
Repositories of best practices
Artificial intelligence systems
Case-based reasoning
Groupware
Web pages
…

KM Infrastructure

| Organization Culture	Organization Structure	IT Infrastructure	Common Knowledge	Physical Environment

Each designates one mark

3

Question 3 (14 marks)
Most organizations are unclear of the impact that KM solutions can have on their business.
1. List the impact areas a KM solution will have on the organization and
2. give 2 example each for the 4 areas.

Use a diagram to illustrate the relationship between the impact areas.

Answer
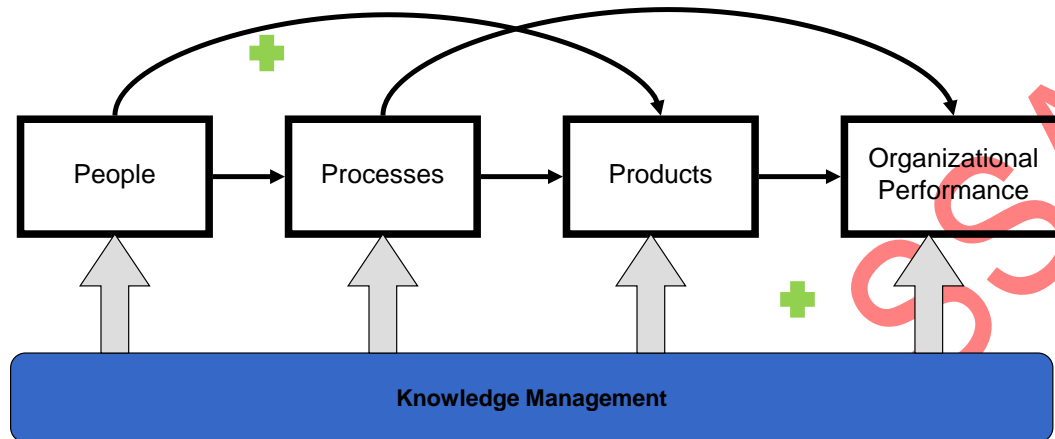
People (3)
- KM can facilitate employee learning
- KM also causes employees to become more flexible, and enhances their job satisfaction

Processes (3)
- KM enables improvements in organizational processes such as marketing, manufacturing, accounting, engineering, and public relations
- These impacts can be seen along three major dimensions
  - Effectiveness
  - Efficiency
  - Degree of innovation of the processes

Products (3)
- Impact on products can be
  - Value-added products
    - KM processes can help organizations offer new products or improved products that provide a significant additional value as compared with earlier products
    - Value-added products also benefit from KM due to the effect the latter has on organizational process innovation
  - Knowledge-based products
    - KM can have a significant impact on products that are knowledge-based like those in consulting or software development, etc.
    - Knowledge-based products can sometimes play a significant role in traditional manufacturing firms

Performance (3)
- Direct
  - Knowledge is used to create innovative products that generate revenue and profit, or when the KM strategy is aligned with business strategy
  - Direct impact of KM on organizational performance can be measured in terms of improvement in "return on investment"
- Indirect
  - Use of KM to demonstrate intellectual leadership within the industry, which, in turn, might enhance customer loyalty
  - Use of knowledge to gain an advantageous negotiating position with respect to competitors or partner organizations
  - Example of indirect impact would be to achieve economies of scale and scope, and providing sustainable competitive advantage

Mark allocation, 1 mark for each impact area mentioned and 1 mark if the explanation is in line with the above content. Diagram required, 2 marks for the diagram.

Question 4 (8 marks)

Using a diagram, draw a high level System Architecture diagram for a Knowledge Application System (that can be based on the SOS Advisor system) that illustrate IT aspects of such a solution. Explain each component briefly.

Answer
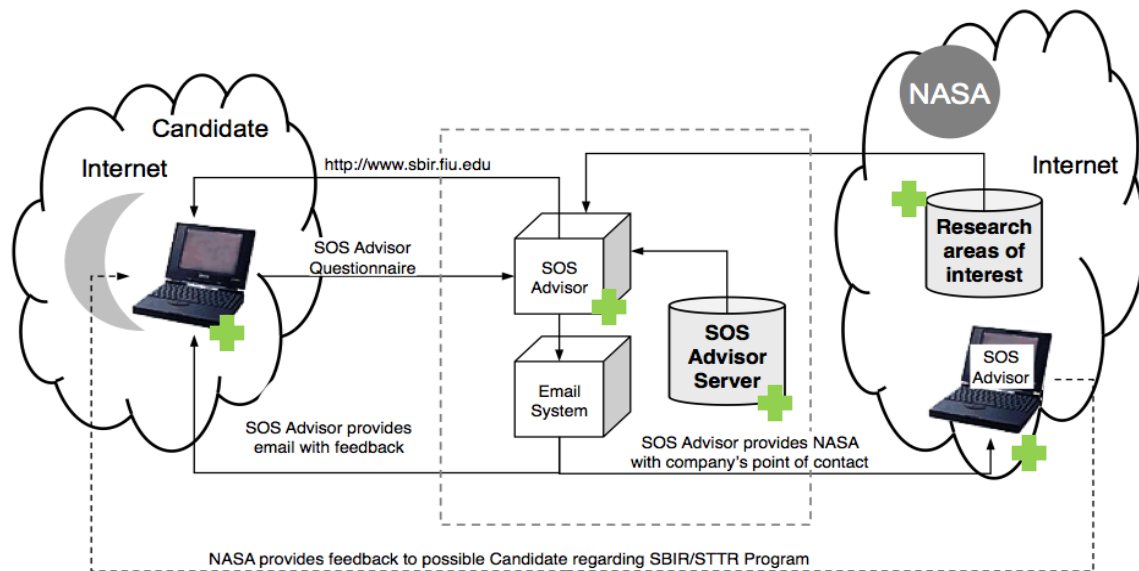
Figure 6.1 **SOS Advisor Architecture**
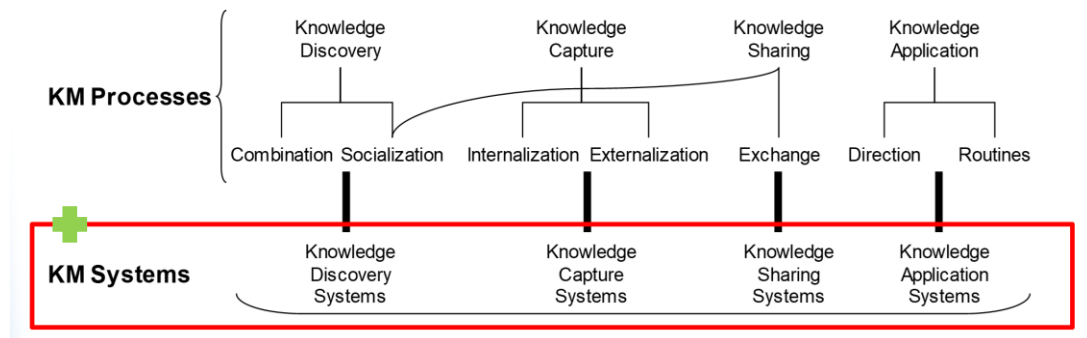
Mark allocation, - diagram as an example
1. *1 mark for client component for knowledge capture and application*
2. *1 mark for middle tier application server*
3. *1 mark for database or knowledge base tier*
4. *1 mark for client facing components for query capabilities*
5. *4 marks for the explanation of each.*

Question 5 (12 marks)

There are several emerging technologies that have a fundamental impact on the KM systems landscape. The most promising ones seem to be AI and machine learning.
Describe how AI and Machine learning will impact KM systems and give examples from your research done during this semester on this topic.

Answer

1. AI based Technologies
   a. Voice, Image and Vision (2)
2. Machine learning technologies
   a. "Smart" algorithms and big data (2)

3. Discovery – example (2)
4. Capture – Example (2)
5. Sharing – Example (2)
6. Application – example (2)

Mark allocation, 4 marks for naming AI and Machine learning technology areas.
8 marks for giving an applicable example for each type of KM system. Diagram not required.

Question 6 (14 marks)

<mark>There are various factors that influence KM. List the 7 steps for identifying appropriate KM solutions and briefly describe each step.</mark>

Answer

1. Assess the contingency factors
   a. assess the organization's environment and business strategy.
2. Identify the KM processes based on each contingency factor –
   a. Identify the 7 contingency factors and the effects that they have.
3. Prioritize the needed KM processes –
   a. Consider them together and get a priority scoring method to assist in the prioritization.
4. Identify the existing KM processes –
   a. using a survey, identify the current processes
5. Identify the additional needed KM processes –
   a. take note of needed and not needed processes.
6. Assess the KM infrastructure –
   a. culture structure and physical environment are the key considerations.
7. Develop additional needed KM systems, mechanisms, and technologies –
   a. based on the previous steps, proceed to implement the short comings.

Mark allocation, 1 mark for naming each step, 1 mark for an explanation of each step

Question 7 (12 marks)

Describe a process for Data Mining in the Knowledge Discovery process.

1. Business Understanding — To obtain the highest benefit from data mining, there must be a clear statement of the business objectives.
2. Data Understanding — Knowing the data well can permit the designer to tailor the algorithm or tools used for data mining to his/her specific problem.
3. Data Preparation — Data selection, variable construction and transformation, integration, and formatting.
4. Model building and validation — Building an accurate model is a trial and error process. The process often requires the data mining specialist to iteratively try several options, until the best model emerges.
5. Evaluation and interpretation — Once the model is determined, the validation dataset is fed through the model.
6. Deployment — Involves implementing the 'live' model within an organization to aid the decision making process.

Mark allocation, 1 mark for naming each step, 1 mark for an explanation of each step

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