UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

Academy of Computer Science and Software Engineering

MODULE: IT Aspects of Knowledge Management
CODE: IT00227 / IT28x27
CAMPUS: APK
EXAM: JUNE 2021 EXAMINATION - SSA

DATE: JUNE 2021   SESSION:
ASSESSOR   MR JP Klut

INTERNAL MODERATOR
EXTERNAL MODERATOR: Prof B. Tait

DURATION: 2 HOURS   MARKS: 100

NUMBER OF PAGES: 5, NUMBER OF QUESTIONS: 19

INSTRUCTIONS:

1. In person examination (where applicable) :
    THIS IS A CLOSED BOOK TEST, ANSWER ALL QUESTIONS AND HAND THIS QUESTION PAPER IN.

2. Online examination (where applicable):
    a) This is a closed book test.
    b) Follow the instructions for Section A and B.
    c) Submit section A's using the CAM app and submit it to the EVE practical portal, Exam 2021 SSA Section A. Ensure your submission is readable.
    d) For section B, submit the Microsoft FORM after completion by clicking the submit button.

1.   SECTION A – CASE STUDY 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 (18 marks)

There are 6 emerging KM practices that are shaping the KM processes and systems. Name and discuss the importance and influence of each one of them.

Answer

1. KM process integration
    1. The processes of discovery, application, sharing and capture are being integrated as a result of the tools.
    2. These processes are becoming hard to distinguish
2. Advanced collaboration and collaboration tools
    1. As a result of cloud and Software as a service, collaboration tools have become very advanced and offers a much more integrated experience for employees.
    2. Many tools integrate with one another offering a wide range of options and domain integration.
3. Automated knowledge discovery, AI and ML
    1. AI has enhanced the ability to search visually, recognise languages and translate information and produce valuable transcripts from conversations.
    2. ML has enabled the discovery of information as well as knowledge on massive volumes of data that was hard and expensive to do in the past.
4. Masses of Information aggregation
    1. Because of ML and Cloud, large bodies of various data and information sources are now accessible and minable.
    2. The open api economy has enabled entities to offer specialised information and knowledge assets
5. Structured and unstructured information processing
    1. Information mining tools have advanced to the point where data entities are well described and easier to understand.
    2. Unstructured documents are more meaningful as a result of the use of XML and machine learning.
6. Cloud based infrastructure
    1. The cloud has enabled massive computing and storage from virtually anywhere
    2. Time to market for KM solutions is much faster than in the past.

Mark allocation: 1 mark for each factor listed and 2 marks for an explanation that is in line with the above.
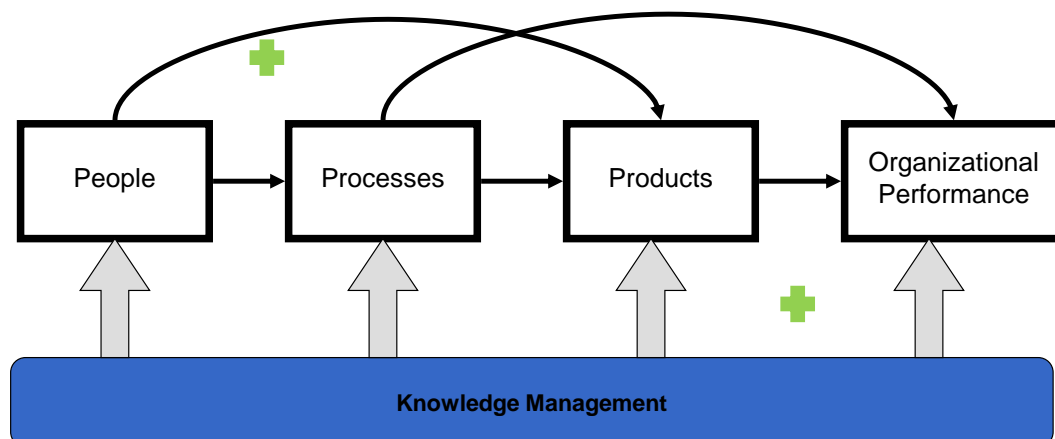
Question 3 (14 marks)

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 examples 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
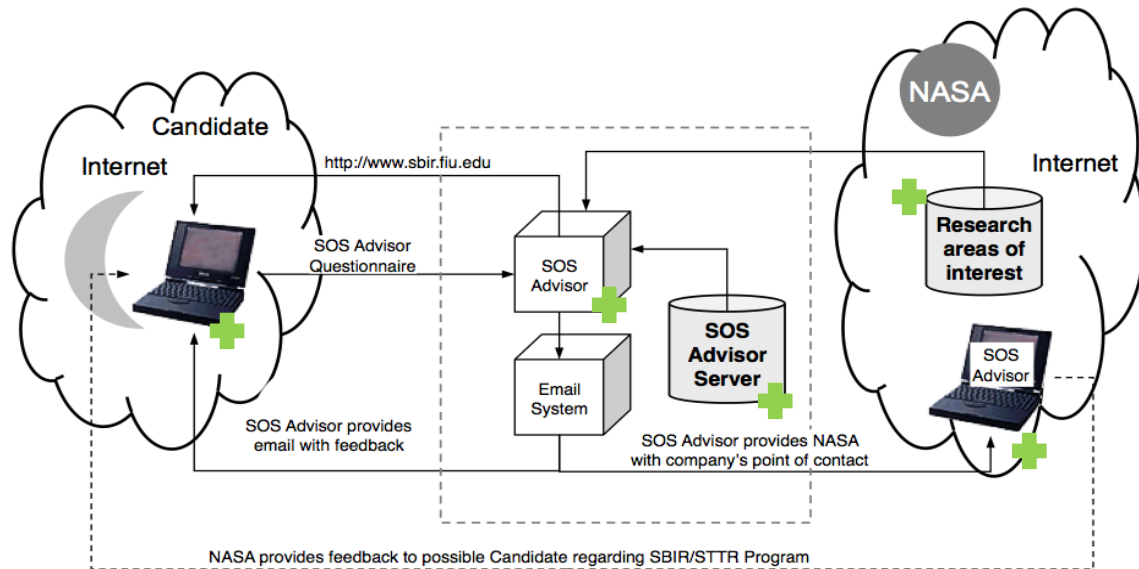
Figure 6.1 **SOS Advisor Architecture**

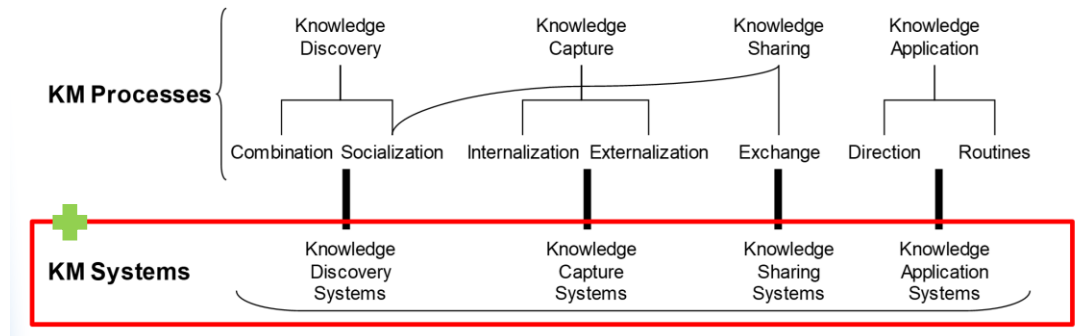*Mark allocation, - diagram as an example*
1. *1 mark for client component for knowledge capture and application*
2. *1 mark for middle tier application server*
3. *1 mark for database or knowledge base tier*
4. *1 mark for client facing components for query capabilities*
5. *4 marks for the explanation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

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

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

Section A total (88)

2. SECTION B – MULTIPLE CHOICE QUESTIONS (12 MARKS)

(Only to be handed out to students who write the exam in person. For students completing this section online, a url will be shared on the day of examination)

Q number	Question

1. Which of the following is true about knowledge?
   a. Knowledge helps produce information from data.
   b. Knowledge produces more valuable information from less valuable information.
   c. Knowledge helps facilitate action.
   d. All of the above.
   e. None of the above.

   Answer: d   **Rating: M**

2. Knowing the expected value of a 6-sided die roll (3.5) is an example of _____.
   a. data
   b. information
   c. knowledge
   d. common sense
   e. gambler's fallacy

   Answer: b   **Rating: M**

3. Which of the following is not an objective view of knowledge?
   a. Knowledge as objects.
   b. Knowledge as access to information.
   c. Knowledge as capability.
   d. Knowledge as practice.
   e. None of the above.

   Answer: d   **Rating: M**

4. The procedure for filing for family emergency medical leave in the employee handbook of an organization is an example of what types of knowledge?
   a. Tacit and procedural.
   b. Explicit and specific.
   c. Explicit and declarative.
   d. Tacit and specific.
   e. Explicit and procedural.

   Answer: e   **Rating: M**

Q number	Question

5. Which of the following knowledge classifications may be characterized as "know what" and "know how"?
   a. Declarative and procedural knowledge.
   b. Tacit and explicit knowledge.
   c. General and specific knowledge.
   d. Objective and subjective knowledge.
   e. Technical and contextual knowledge.

   Answer: a   **Rating: M**

6. Which of the following statements describes associational expertise?
   a. Knowledge held as collective beliefs and actions of a group.
   b. A skill learned through extensive practice.
   c. Knowledge of relationships between observed events and causes.
   d. Creative ingenuity based on theoretical knowledge of the domain.
   e. Knowledge focused on multiple distinct areas of expertise.

   Answer: c   **Rating: M**

7. Which types of knowledge are represented by an HR manager's knowledge of factors to consider in motivating an employee to participate in the company's new knowledge sharing business culture?
   a. Explicit and declarative.
   b. Tacit and contextually specific.
   c. Procedural and technically specific.
   d. General and procedural.
   e. Explicit and procedural.

   Answer: b   **Rating: M**

8. What is the explicitness of a piece of knowledge?
   a. The number of domain areas to which the knowledge refers.
   b. The extent to which knowledge exists in an explicit form.
   c. The level of action enabled by the knowledge.
   d. The extent to which the knowledge can be taught to others.
   e. The level to which knowledge can be acquired by individuals with specific knowledge.

   Answer: b   **Rating: M**

9. Which of the following are people knowledge reservoirs?
   a. Individuals and their technology.
   b. Individuals and knowledge repositories.
   c. Individuals and groups.
   d. Individuals and their practices.
   e. Individuals and organizations.

   Answer: c   **Rating: M**

Q number	Question
10.	A spreadsheet of weekly orders for specific products of an organization with trend lines added is an example of what type of knowledge reservoir? a. Knowledge repositories. b. Organizations. c. Organizational networks. d. Technologies. e. Practices. **Answer: d**　　　　　　　　　　　　　　　　　　　　　**Rating: M**
11.	Chapter 3: Knowledge resources are relevant to the decision making of which of the following? a. An individual. b. A corporation. c. A department within a firm. d. A and c. e. All of the above. **Answer: e**　　　　　　　　　　　　　　　　　　　　　**Rating: M**
12.	"Get the most (out of knowledge resources)," reflects the impacts of KM on the _____ of the individual or the organization. a. goal achievement b. motivations c. business strategies d. performance evaluation e. market value **Answer: a**　　　　　　　　　　　　　　　　　　　　　**Rating: H**

(End of section B)

Section B Total (12)
Grand total (100)

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