Unit 6: Introduction to Ontology Building and Online and Offline Tools

Formative Activities
Student: Anastasia Rizzo

Read Chapter 3 of Solanki, A (2019) An Introduction to Knowledge Engineering.

- Reflect on the various data acquisition methods.
- What are the advantages and disadvantages of each method?
- Think about scenarios and which methods would be suitable for each.

Answer:

Reflecting on the various knowledge acquisition methods mentioned in the book, let's consider the advantages and disadvantages of each method and think about scenarios where each method would be suitable:

1. **Interviews.**

Interviews involve direct interaction with experts to acquire context-specific knowledge.	
Advantages	Disadvantages
● Direct interaction with domain experts allows for rich, context-specific knowledge extraction. ● Enables clarification of tacit or unarticulated knowledge. ● Facilitates dynamic, two-way communication.	● Time-consuming and resource-intensive. ● Highly dependent on the expertise and availability of the interviewee. ● May not be suitable for all types of experts or knowledge domains.

Scenario: Interviews are suitable when in-depth, nuanced knowledge is required, and when experts are readily available and willing to participate. They are often used in the early stages of knowledge acquisition.

Real-Life Scenario: Legal Case Preparation and Witness Interviews.
In the legal field, attorneys conduct witness interviews to gather context-specific information about a case. This method is suitable when in-depth knowledge about an event or situation is required, and when witnesses are available and willing to

participate. Witness interviews are often used in the early stages of legal case preparation (Tompkins et al., 2020).

2. **Documentation Analysis.**

Documentation analysis involves reviewing and extracting information from existing written materials.	
Advantages	Disadvantages
• Allows for the review and extraction of existing written materials. • Can capture historical knowledge and serve as a reference. • Cost-effective and less intrusive compared to interviews.	• May not capture tacit knowledge or recent developments. • Relies on the availability of relevant documentation. • Limited to the quality and comprehensiveness of the documents.

Scenario: Documentation analysis is suitable when a substantial body of written information exists, and you want to extract knowledge without direct expert involvement.

Real-Life Scenario: Historical Research and Archival Document Analysis
In historical research, historians analyse archived documents, letters, and manuscripts to extract knowledge about past events and eras. This method is suitable when there is a substantial body of written historical materials, and researchers aim to extract knowledge without direct expert involvement. It is commonly used to study and gain insights into historical events and periods (Mohr & Ventresca, 2002).

3. **Questionnaires.**

Questionnaires are structured tools for collecting information from a group of respondents.	
Advantages	Disadvantages
• Can be administered to a large number of experts or participants. • Structured format allows for standardised data collection. • Can collect quantitative data for analysis.	• Limited to the questions asked, potentially missing important details. • May not capture nuances or context-specific knowledge. • Response quality can vary based on the expertise of the respondents.

Scenario: Questionnaires are suitable when you need to gather data from a broad group of experts or when quantitative analysis is essential.

Real-Life Scenario: Customer Feedback Surveys
In the business world, companies often use customer feedback surveys to gather insights from a broad customer base. This method is suitable when businesses need to collect feedback from a large number of customers and quantitative analysis is essential for understanding customer satisfaction and preferences. Customer feedback surveys provide structured data that can be quantitatively analysed (Qualtrics, 2023).

4. **Formal Techniques.**

Formal techniques provide a structured framework for representing knowledge, often used in well-defined domains.	
Advantages	Disadvantages
● Provide a structured framework for knowledge representation. ● Can ensure consistency and reliability in knowledge extraction. ● Suitable for domains with well-defined rules and procedures.	● May not capture tacit or heuristic knowledge effectively. ● Requires expertise in applying formal methods. ● Can be rigid and less adaptable to changing contexts.

Scenario: Formal techniques are suitable for domains with clearly defined rules and procedures, where structured representation is critical.

Real-Life Scenario: Financial Risk Assessment Models

In the financial industry, formal techniques are employed to develop structured risk assessment models. This method is suitable for domains with clearly defined rules and procedures, such as financial risk assessment. These models provide a structured framework for representing and analysing financial data, ensuring consistency and reliability in assessing potential risks. While they are effective for quantitative risk analysis, they may not capture more nuanced, tacit financial insights (CFI, 2023).

5. **Observation Analysis.**

Observation analysis entails direct observation of experts in their work context to capture real-time, context-specific knowledge.	
Advantages	Disadvantages
• Allows for direct observation of experts in their work context. • Can capture real-time, context-specific knowledge. • Useful for understanding how experts perform tasks.	• May be intrusive and require expert consent. • Limited to what is observable and may miss mental processes. • Time-consuming and resource-intensive.

Scenario: Observation analysis is suitable when you need to understand how experts work in their natural environment and capture context-specific knowledge.

Real-Life Scenario: User Experience (UX) Testing
In the field of user experience (UX) design, researchers conduct user testing sessions to observe how individuals interact with websites or software interfaces. This method is suitable when there is a need to understand how users engage with digital products in their natural environment. UX testing involves direct observation of users as they navigate interfaces, providing real-time, context-specific insights into usability and user behaviour. However, it can be time-consuming and may require the consent of participants, as well as careful analysis of observable user actions (Interaction Design Foundation, 2023).

In real-world scenarios, a blend of these methods is frequently employed, depending on the particular demands of the knowledge acquisition endeavour. The selection of the method should be in harmony with the type of knowledge sought, the accessibility of experts, and the available resources.

References:

CFI (2023) Financial Risk Management Process. Available from: https://corporatefinanceinstitute.com/resources/career-map/sell-side/risk-management/financial-risk-management-process/ [Accessed 20 September 2023].

Interaction Design Foundation (2023) User Research. Available from: https://www.interaction-design.org/literature/topics/user-research [Accessed 20 September 2023].

Mohr, J. & Ventresca, M. (2002) *Archival Research Methods*. 10.1002/9781405164061.ch35.

Qualtrics (2023) Customer experience insights: How to gather and use feedback. Available from: https://www.qualtrics.com/experience-management/customer/customer-insights/ [Accessed 20 September 2023].

Solanki, A. (2019) *An Introduction to Knowledge Engineering*.

Tompkins, A., Avergun J., & Duncan R. (2020) Witness Interviews in Internal Investigations: The US Perspective. Available from: https://globalinvestigationsreview.com/guide/the-practitioners-guide-global-investigations/2020/article/witness-interviews-in-internal-investigations-the-us-perspective [Accessed 20 September 2023].