Large Language Models and the Elicitation of Tacit Knowledge

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1. Background

- **Tacit knowledge** — implicit expertise gained from personal experience[1], is crucial yet elusive, often remaining unspoken and undocumented. Its elicitation is vital for continuous learning and decision-making in various professional fields.

- Traditional methods of eliciting tacit knowledge, such as interviews and direct observations[2], are time-consuming and often fail to capture the depth and nuance of such knowledge.

- **Large Language Models (LLMs)**, with their advanced capabilities in **Natural Language Processing (NLP)**, are well suited for knowledge elicitation.

2. Research Questions

Main Question:
- **How can LLMs be leveraged for tacit knowledge elicitation?**

Sub-Questions:
1. What characteristics of LLMs make them suitable for eliciting tacit knowledge?
2. How do methodologies utilizing LLMs for tacit knowledge elicitation compare with traditional methods?
3. What are the ethical considerations of using LLMs for tacit knowledge elicitation?

3. Methodology

- **Literature Review Process :** Adopting the **PRISMA** workflow, focusing on the intersection of LLMs and tacit knowledge.

- **Search Strategy:** Keywords related to **'Large Language Models'**, **'tacit knowledge'**, and **'knowledge elicitation'** were employed in various combinations to ensure comprehensive coverage.

4. Results

Key Findings:
- LLMs have demonstrated exceptional capability in interpreting complex language patterns and contextual cues that are crucial for extracting tacit knowledge.

- By engaging users in more interactive dialogues, LLMs facilitate a deeper exploration of subject matter expertise[4].

- LLMs can be integrated with **Knowledge Graphs (KGs)** to enhance the accuracy and relevancy of the knowledge being elicited[3].

- LLMs can analyze live data streams to provide tacit knowledge-based guidance.

- However, LLMs may face limitations in bias and representativeness of training data.

- LLMs can raise ethical concerns, including privacy issues and the potential for misuse of sensitive information.

5. Conclusion

- LLMs hold significant potential for enhancing the elicitation of tacit knowledge. Their advanced ability to process natural language allows them to capture nuanced information that traditional methods might miss.

- While technologies can enhance knowledge elicitation, they must be implemented with strict adherence to ethical standards and ensure privacy as well as the integrity of the knowledge captured.

6. Limitations

- Majority of literature originates from technologically advanced regions.

- The selection of literature primarily focused on recent studies published in English.

- Not all studies explain their full methodological frameworks.

7. References

[1]: Michael Polanyi. The tacit dimension. In *Knowledge in organisations*, pages 135–146. Routledge, 2009.
[2]: Nancy J Cooke. Varieties of knowledge elicitation techniques. *International journal of human-computer studies*, 41(6):801–849, 1994.
[3]: Enzo Fenoglio et al. Tacit knowledge elicitation process for industry 4.0. *Discover Artificial Intelligence*, 2(1):6, 2022.
[4]: Samuel Kernan Freire et al. Tacit knowledge elicitation for shop-floor workers with an intelligent assistant. In *Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*, pages 1–7, 2023.