



KAP Based PICO-Compliant Query Construction

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Abstract— In recent years, the volume of biomedical research literature has grown exponentially which posed challenges for the clinical practitioners in terms of “well-built” question preparation and search query generation. The key objective is to facilitate the process of automatically constructing a “well-built” question in order to save preventable time.

Keywords—PICO; Query; Mapping Model; KAP; MAP.

I. INTRODUCTION

In healthcare domain while practicing evidence-base medicine, formulating a well-built question becomes a necessity. It poses several challenges such as how to formulate the question? From where to populate the contents for the question? Formulating a question in PICO format simplifies the next steps of searching from online literature. Theoretically, it is an appealing form to make an appropriate question for searching, however, the big hurdle is to provide the adequate contents for different parts of PICO. Doing manually, it become time consuming for the busy clinical practitioners. At the same time, it is hard for a non-expert practitioners to comprehend the real meaning of each part without having a deep understanding of the domain concepts with respect to PICO. In order to make the question construction easier for a user, we need an automatic mechanism for content filling in PICO template.

II. METHODS

We propose a generic model called (Knowledge Alignment to PICO (KAP) that provides two-level mappings: structure- and concepts-level mappings.

A. Structure-level mappings

The proposed KAP model provides structure mapping guidelines of a clinical decision support system (CDSS) knowledge to map with PICO. KAP model is independent of any specific knowledge representation formalism thus provides the flexibility to be used for different knowledge representations. In order to realize the KAP model, we propose specialized mapping models such as MAP (MLM Alignment to PICO), GLAP (GLIF Alignment to PICO), PRAP (Production Rule Alignment to PICO), and others. The specialized models map the slots of a particular knowledge representation scheme physically.

B. Concepts-level mappings

At concept level mappings, the concepts are matched with available standard terminologies such as SNOMED CT and

UMLS. Once a concept is matched, it is further confirmed whether the matched concept belongs to any specified part of PICO or not. For a correct matched concept, it is determined whether it has numeric value or descriptive. Concepts having numeric values are given comparatively less importance due to their impact on the hit ratio in information retrieval. Finally, the salient concepts are concatenated to construct the final PICO-compliant query.

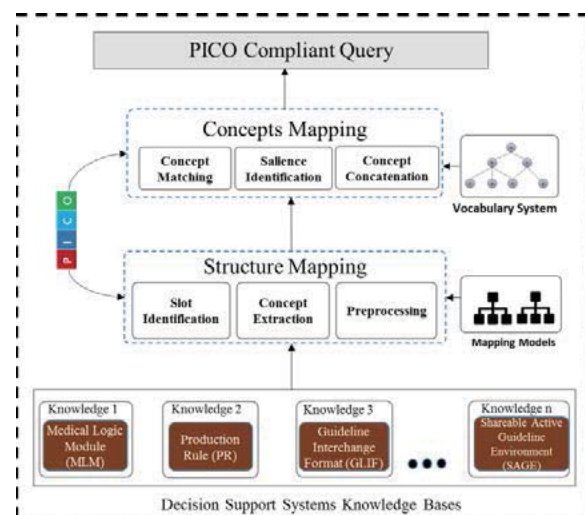


Figure 1: PICO-compliant query construction with Knowledge Alignment to PICO (KAP) model

III. CONCLUSION

In this work, we introduced the concept of automatically constructing a PICO-compliant query from diverse sources of knowledge representation. We used two level mappings: structure- and concepts-level. This work opens future research venues such as validation and verification for a fully automated query in order to make it more target oriented.

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