Capturing Healthcare Expert's Knowledge Digitally: A Scoping Review of Current Approaches

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Abstract : Mitigating organisational knowledge loss presents challenges for knowledge managers. Expert knowledge is embodied in people and captured in 'routines, processes, practices and norms' as well as in the paper system. These knowledge stores have limitations in so far as they make knowledge diffusion beyond geography or over time difficult. However, technology could present a potential solution by facilitating the capture and management of expert knowledge in a codified and sharable format. Before it can be digitised, however, the knowledge of healthcare experts must be captured. Methods: As a first step in a larger project on this topic, a scoping review was conducted to identify how expert healthcare knowledge is captured digitally. The aim of the review was to identify current healthcare knowledge capture practices, identify gaps in the literature, and justify future research. The review followed a scoping review framework. From an initial 3,430 papers retrieved, 22 were deemed relevant and included in the review. Findings: Two broad approaches –direct and indirect- with themes and subthemes emerged. 'Direct' describes a process whereby knowledge is taken directly from subject experts. The themes identified were: 'Researcher mediated capture' and 'Digital mediated capture'. The latter was further distilled into two sub-themes: 'Captured in specified purpose platforms (SPP)' and 'Captured in a virtual community of practice (vCoP)'. 'Indirect' processes rely on extracting new knowledge using artificial intelligence techniques from previously captured data. Using this approach, the theme 'Generated using artificial intelligence methods' was identified. Although presented as distinct themes, some papers retrieved discuss combining more than one approach to capture knowledge. While no approach emerged as superior, two points arose from the literature. Firstly, human input was evident across themes, even with indirect approaches. Secondly, a range of challenges common among approaches was highlighted. These were (i) 'Capturing an expert's knowledge'- Difficulties surrounding capturing an expert's knowledge related to identifying the 'expert' say from the very experienced and how to capture their tacit or difficult to articulate knowledge. (ii) 'Confirming quality of knowledge'- Once captured, challenges noted surrounded how to validate knowledge captured and, therefore, quality. (iii) 'Continual knowledge capture'- Once knowledge is captured, validated, and used in a system; however, the process is not complete. Healthcare is a knowledge-rich environment with new evidence emerging frequently. As such, knowledge needs to be reviewed, updated, or removed (redundancy) as appropriate. Although some methods were proposed to address this, such as plausible reasoning or case-based reasoning, conclusions could not be drawn from the papers retrieved. It was, therefore, highlighted as an area for future research. Conclusion: The results described two broad approaches – direct and indirect. Three themes were identified: 'Researcher mediated capture (Direct)'; 'Digital mediated capture (Direct)' and 'Generated using artificial intelligence methods (Indirect)'. While no single approach was deemed superior, common challenges noted among approaches were: 'capturing an expert's knowledge', 'confirming quality of knowledge', and 'continual knowledge capture'. However, continual knowledge capture was not fully explored in the papers retrieved and was highlighted as an important area for future research.

Keywords : expert knowledge, healthcare, knowledge capture and knowledge management

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