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Providing Explanations via the EQR Argument Scheme

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Abstract. This demo paper outlines the EQR argument scheme (AS) structure and deploys its instantiations to convey explanations using a chatbot.

Keywords. argument schemes, chatbot, explanations, decision-support systems

Devised as a pattern of **E**xplanation-**Q**uestion-**R**esponse interactions between agents, the EQR scheme draws from the *AS for Practical Reasoning* [1] and the *Expert Opinion* [2] schemes in order to formalise the consequences entailed by following the assertion of an expert opinion. A reference to such authority provides the rationale that justifies the conclusion of the argument, also leaving chances of inquiry for more detailed explanations.

EQR Scheme
Premise : In the current state R *Premise* : asserting α (from an expert E in a field F) *Premise* : will result in a new state S *Premise* : which will make proposition A true (alternatively, false) *Premise* : which will promote some value v
Conclusion : Following the opinion α should make proposition A true (false)

CONSULT[2] is a novel data-driven mobile decision support system (DSS) designed to help patients with chronic conditions self-manage their treatment plans [3]. Such a DSS can deliver to the user more exhaustive information and more detailed answers to follow-on questions by employing the EQR scheme through a chatbot.

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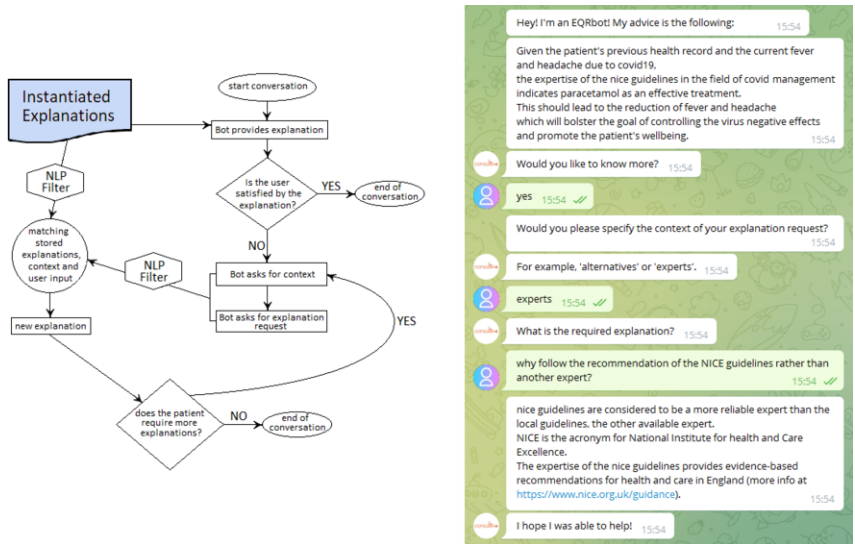

Figure 1. High-level operations (left), and example of explanations performed by the chatbot (right).

EQRbot. The interaction with the patient will be handled by the chatbot[3] which, after providing the initial explanation (i.e., an instantiation of the EQR scheme through the data collected by CONSULT), will ask the patient for feedback. If the user is satisfied, then the conversation will immediately end. Alternatively, the chatbot will demand a brief context along with the actual patient's request. By matching stored explanations, context and user input, the bot will output the additional solicited information (Figure 1, left). Observe that the double query prompted by the bot, along with a general NLP filter, ensures a significant reduction of misunderstandings when providing answers.

Example. Consider a patient suffering from fever and headache due to the Covid-19 virus. These facts, and the treatment recommended by the clinical guidelines of NICE-NG191[4], will be registered and encoded by the CONSULT system, eliciting the instantiation of the EQR scheme (the initial explanation) and of potential additional information (subsequent explanations) that will be conveyed by the EQRbot (Figure 1, right).

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