

Context-aware Dialogue Management Framework for Healthcare

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Abstract—A revolutionized wave of intelligent assistants has emerged in daily life of human over the recent years, therefore huge progress has been witnessed for development of healthcare assistants having the capability to communicate with users. This paper proposes Context-aware Dialogue Management (CADM) framework using speech based interaction with Healthcare systems such as CDSS.

I. BACKGROUND

Healthcare systems such as Clinical Decision support systems (CDSS) plays significant role in promoting healthcare and wellness in patient care. Introducing dialogue-based feature can improve personal healthcare by providing users to interact with systems. Researchers are more focused, with how to make robots for more engaging to people [1] using different methods for identifying the physical contexts. Intents identified during dialogue are closely related to context, which includes not only external environmental contexts like time, weather, location, etc. but also personal contexts. The relationship between context and intent is complicated, which exhibits complex co-occurring and sequential correlation [2]. In [3] authors have highlighted the importance, “*intentions in context is an essential human activity during conversation*”. Similar likelihood will also be considered as important as for any robot if its functionality is required in any social domains.

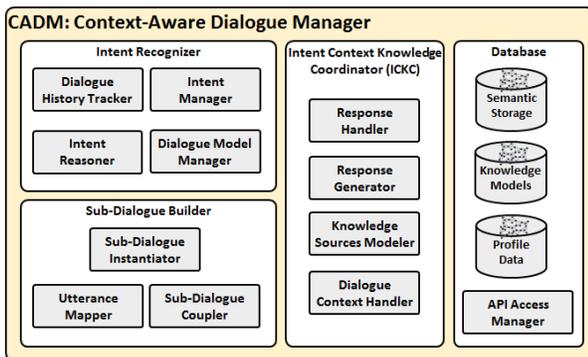


Figure 1 Context-aware Dialogue Management Framework

II. CADM: CONTEXT-AWARE DIALOGUE MANAGER

We propose CADM framework based on Joint Directors of Laboratories (JDL) fusion model taking care for all aspects of *information fusion* processes as mentioned in Fig. 1. This framework focuses on the domain of dialogue-based systems, where users communicate with system through speech/text.

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We designed this framework for Intelligent Medical assistant (IMA) which facilitates users to interact using conversation for healthcare issues, diagnosis, recommendations etc. CADM comprises of *sub-dialogue builder* responsible for conversion of conversational entities obtained from *language processor* into ontological form, *Intent Recognizer* determines conversational intents, and *intent-context knowledge coordinator* for generating intent-context fused responses in IMA and coordinates with *knowledge sources* for appropriate response generation as mentioned in Fig. 2. CADM considers intent identification and context determination as per Level-3 and Level-4 respectively in JDL Model.

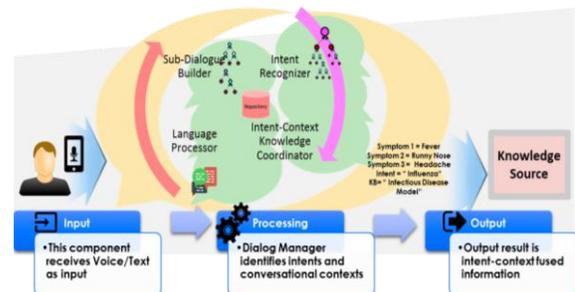


Figure 2 Dialogue Management Process Workflow

III. CONCLUSION AND FUTURE WORK

The proposed CADM framework provides conversational intent-content fusioning for effective response generation. As a future work, we aim to implement this framework for interaction with healthcare domains. Furthermore, we plan to evaluate IMA for performance, efficiency and facilitation to users.

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