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A study on extracting Cause-Effect relations and these application for Why-question answering

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From the early of the study about machine learning, natural language processing is one of the main majors focusing that all the researchers want to focus on. Not only to understand more of human language and culture, but it is also to help improve the computer's understanding and comments and requests from human. Since the 1960s, scientists have been interested in developing a question answering system to help people find knowledge as well as questions that need to be addressed. Most successfully, two early question answering systems during this time period were BASEBALL [1] and LUNAR [2]. Both question answering systems were very successful in their own domain. And thanks to these advancements, we can now rely on the computer to get answers for variety kinds of questions. The question answering system is split into two types of domain system: opening and closing. The Automatic Response Generating System focuses primarily on factual questions such as who, what, when, where, and when. The reasons behind that is these answers can be extracted directly from the answer passages based on the relevant main words.

Why question answering task is mostly ignored because of the techniques that applied for factoid questions are not suitable, and the frequency of why-question is normally lower than the others. There are a variety of earlier methods suggested for improving the efficiency of answering questions such as concentrating on the causality of linked terms. In the other hand, it also has downside when the answer passage is not clear about the connection and the answer passages are scratched widely in the data. In this study, I concentrate mainly on two pathways: the use of a new embedding method that is useful for keyword or search expansion, semantic search and information retrieval for learning causality from

annotated data. After that, and maybe more important, it perfects the causal relations between the cause-and-effect pieces, which can benefit greatly from downstream models like LSTM [3] or CNN's [4] or BM25[5], sentence BERT [6] which require numerical inputs to provide us with a good idea for answering the model questions.

Keywords: Deep Learning, Question Answering, cause-effect relations, why-question answering, news articles