INTRODUCING ADAPTABILITY TO NATURAL - LANGUAGE SYSTEMS THROUGH USER MODELING

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DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Vasana Jayachamaree Wijesooriya Date

The above candidate has carried out research for the Masters Dissertation under my supervision.

....

Project Supervisor: Dr. Daya Chinthana Wimalasuriya Date

Abstract

A primary way of improving spoken dialogue technology towards incorporating more natural human-computer interaction is by making the systems user-adaptive, which indicates the ability of dialogue systems to conduct user-tailored interaction. Such an adaptation of the system to an individual user can be achieved by building a system's model of the user and exploiting this model to provide responses customized for the individual user. In this case, the system will adapt its part of the dialogue interaction according to the user's goals, plans and beliefs inferred by its user model enabling communication with the user in a manner more convenient for addressing his/ her requirements. Also, the system is required to change its user model dynamically, in order to reflect the specific characteristics of the particular user. The prototype system has been built as an attempt at exploring how dialogue systems can be made user adaptive through the above concept of building and exploiting dynamic models of users.

The system specifically demonstrates how this technology can be harnessed to cater for large-scale business domains such as insurance and banking industries where the call centers can make use of such a system to attend the typically overwhelming amounts of customer queries, saving hugely the employee time and effort.

Keywords: Spoken Dialogue Systems, Natural Language Processing, Dynamic User Modeling, User Adaptation

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DEFINITIONS, ACRONYMS AND ABBREVIATIONS

List of abbreviations

Abbreviation	Description
BN	Bayesian Network
DM	Data Management
HCI	Human Computer Interaction
IVR	Interactive Voice Response
NLG	Natural Language Generation
NLU	Natural Language Understanding
SDS	Spoken Dialogue System

List of definitions

Term	Definition
discourse context	(Dynamically changing) scope of the linguistic content and linguistic forms within a conversation(Courtesy: Wikipedia)
dialogue history	The set of preceding dialogs in a conversation
anaphora	Use of an expression of which the interpretation depends upon another (former) expression in context(Courtesy: Wikipedia)
ellipsis	Intentional omission of a word, sentence, or whole section from an utterance without altering its original meaning(Courtesy: Wikipedia)