AGORA. Multilingual Multiplatform Architecture for the development of Natural Language Voice Services

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Abstract

The natural language spoken dialogue system AGORA has been developed using a Collaborative Dialogue model with Mixed Initiative and Computational Linguistic models and experiences. Thanks to these technologies, the system is highly flexible and it doesn’t need keywords or directed menus. In this demo you will see the multilingual ability and the proacticity possibilities of the system. You will also observe a multiservice system and a vocal platform with the last advances in data collection of expert subdialogues.

1 Introduction

The most important feature of any modern speech-system is the vast amount of information that must manage. The exponential growth of this amount of information has introduced new complexity to these systems.

We have developed a Customer Communication Speech System, AGORA, based on a natural spoken dialogue with four basic pillars:

- Proactivity.
- Recuperation and Management of dialogue mistakes.
- Learning Skill to structure and store different kinds of knowledge.
- Reusing Ability of expert subdialogue modules.

This technology enables people to communicate and obtain information in an intuitive way without the necessity of guided menus that request the user to know keywords or special terminology. The system is Collaborative with free interaction and not guided. Users can ask any question to the system, when and how they want to, using their own everyday words and phrases, just as if they were talking to another person.

AGORA it’s been used successfully in a wide range of information services in which customers have been able to communicate with a presential or remote machine monitored by this system.

Moreover AGORA has the possibility of incorporating new services since it’s a platform of association, composed by a Kernel and an increasing amount of modules or subdialogues.

Another important advantage of AGORA is its infrastructure that facilitates the fast generation of new services and applications. Therefore, it’s not a system that just works for certain services. In fact, it’s been used in a wide range of customer services like information services, Voice Portals, etc.

AGORA is also multilingual and so has the ability to keep dialogues in different languages. By changing only three configuration files, the system is able to “speak” in the selected language.

2 Main Features

Mixed Initiative: the system is able to understand and provide proper interpretation for all the user intentions, in whatever order they appear, and even if the focus of the dialogue has been changed by the user. This means that the user can request to do a task giving the necessary data to complete it in the order that he wants. If the system needs any other information from the user, it will ask him directly. If it’s not possible
to receive that information, the system will help
the user or it will tell him what he can do to
achieve his objective.

**Expert Subdialogues:** To improve robustness
against recognition errors in mass data obtainment
we provide different modules that require several
complex processes that have been isolated and
implemented with the strategies of Segmentation
of data structures and Generation of Echoes.

**Proactivity:** This feature allows the system to
take the initiative in certain moments of the
dialogue, making suggestions and giving the
requested information according to the tastes and
frequent uses of the user. Proactivity produces
changes in the strategies of dialogue control
depending on on-line measurements of certain
parameters.

**Multiservice System:** One important
advantage of AGORA is its infrastructure, which
facilitates the fast generation of new services and
applications. The association of these new ser-
dvices is done thanks to a dynamic context change
system that also allows the user to change the
topic of the conversation at any particular
moment of the dialogue as well as moving from
one service to another just by asking to do so in a
colloquial way. Therefore, the user doesn’t need
to use any menus or move back in the dialogue.
This context change ability leads to a free
dialogue between the user and the system.

**Multiplatform System:** Since AGORA is a
platform of association, we can integrate in it
other services done in different platforms (like
Voice-XML system) and vice versa. The
multiplatform is based upon a module (Watcher
Agent) that keeps the surveillance of the system
and controls in every moment the interrelation
and the dispatching of tasks among all the asso-
ciated services (see Figure 1).

**Multilingual Dynamic system:** AGORA has
being designed to be a multilingual SLDS and
initially it is able to hold dialogues in Spanish,
Catalan, as well as in Latin American Spanish.
Moreover the user can change the language at
any particular moment of the conversation. As
we allow a dynamic change of language during
the progress of any dialogue, our architecture
must deal with the dynamic activation and
deactivation of these resources for a particular
language.

![Diagram](Env_Gen_Ser_AGORA.png)

**FIGURE 1: Flow and Engine AGORA Portal**

**Demonstration of Portal “AGIL”**: In this
system we integrate several services with dif-
ferent levels of dialogue complexity that demand
different dialogue strategies. The particular ser-
dvices our Voice Portal include are the following:

- Information based services: Traffic, News and Meeting, Weather informs.
- Interactive voice access to a TV guide
- Personal-agenda: appointments.
- Voice access to electronic Mail: Voice mail operation.
- Recharge mobile or cash card.

Another important feature this demonstration
will point out is the **multilingual capability**
of our environment. All the interactions with the
Voice Portal can be done either in Spanish,
Catalan or Latin American Spanish. Moreover a
user can switch dynamically from one language
to another just saying expressions like “now I
prefer to speak in Catalan”. We will illustrate,
therefore, in a real application working on a
**mobile telephony platform**, this multilingual and
**multiservice** environment with **Proactivity**.