

Designing the Interactive society: naturally speaking

A recent issue of HBR described the development of a software service for poor farmers in India. In order to speed up the process, the research team utilised a Wizard of Oz user interface instead of writing thousands of lines of code that would take months to develop. But what is this “Wizard of Oz” and what has it to do with software development? This article will describe the methodology with a view to informing managers and disseminating the process more widely.

The increased deployment of self-service technology (SST) in business to customer (B2C) transactions is being driven by the diffusion of information and communications technology (ICT). This is coupled with the demand to move from high-cost manual transactions to low-cost automated self-service in enterprises and the public service. These services are becoming increasingly critical for enterprises challenged with providing e-commerce solutions and building relationships in a world where customer and vendor do not meet face-to-face. Among SST interfaces, the use of speech is regarded as ideal because it is the most natural, flexible, efficient and economic form of human-machine communication. However creating conversational automated agents with responsibility for service levels and maintaining customer relationships is a complex challenge. Providing speech enabled services requires capability in speech communication technologies, applications programming and professional services while being cognisant of the environment of customer psychology and culture.

According to recent Gartner reports, speech recognition has move from the land of “hype” to being well on its way to mainstream adoption. Speech solution providers are citing high profile implementations including a UK bank which is handling millions of calls per week and a US healthcare service with two million customers that has patients and physicians using its speech enabled appointment facility. Figure 1 shows a generalized topology of a speech-enabled system.

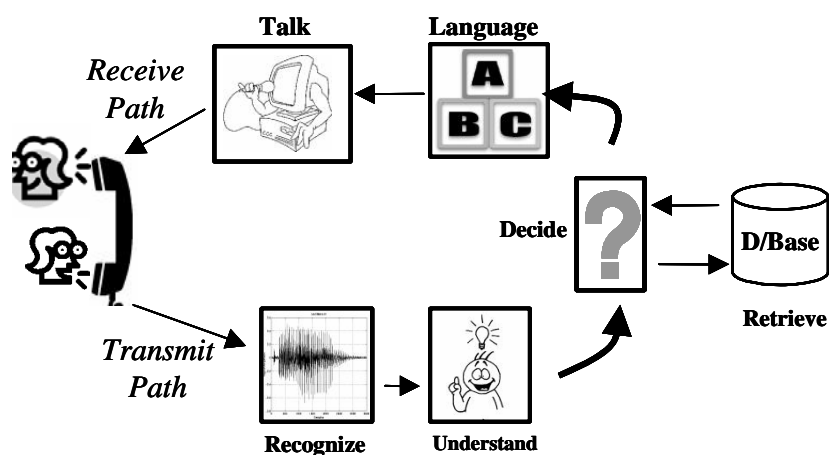


Figure 1: Speech enabled business topology

A number of test methods are used to tune a speech-enabled system: these include usability testing at various stages of the development process, focus groups, and piloting the service in a population of “friendly” users. One technique developed to simulate human-computer dialogue systems is called a Wizard-of-Oz (WOZ) experiment where a hidden human operator replaces the automated agent in order to experimentally investigate the usability of the system before being deployed in the field. The Wizard-of-Oz is also known as a PNAMBIC (**P**ay **N**o **A**ttention to the **M**an **B**eh**I**nd the **C**urtain) system where the human operator (the wizard) is disguised behind some interface software and the caller thinks that they are interacting with an automated application. The concept originated from the 1899 book by Frank Baum and the 1939 MGM film where Dorothy, the Tinman, the Lion and the Scarecrow follow the yellow brick road to Oz in order to make their requests to the awesome Wizard. In the end, the awe-inspiring ruler of Oz turns out to be just a simulation controlled by a very ordinary human . In WOZ experiments, the function of the Wizard is played by a human but the user believes it is a computer. Figure 2 shows the typical architecture of a WOZ experiment designed to simulate a speech recognition application.

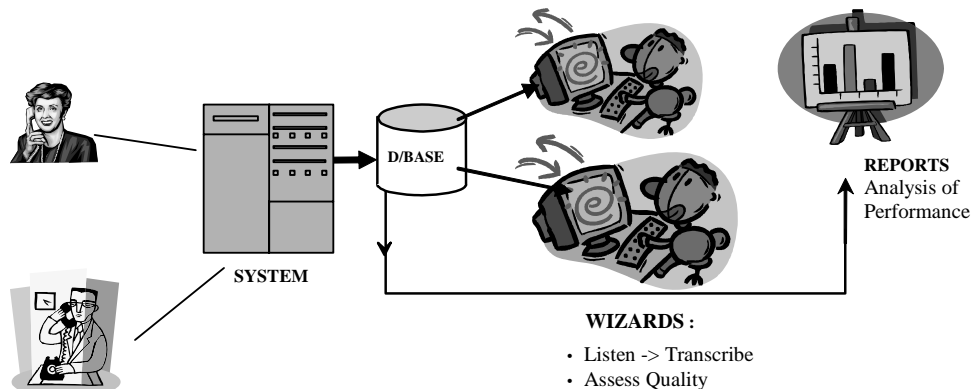


Figure 2: typical WOZ architecture

A number of research projects aimed at applying the methodology to other areas have been undertaken. These include: applying WOZ to the development of a learning interface agent in order to make the system more natural, intelligent and even emotional; the development of a robotic interface that is capable of simulating a number of different social behaviours; and the collection of data in the complex domain of tutorial dialogues between university students and a mathematical tutoring system.

Business analysts are predicting the continued rapid growth in automated ICT applications and deployment of SST. These services bring together leading edge technologies, the psychology of human-machine interaction, business processes and the management of customer contacts. The resilience of the solution is critical in an environment where customer relationship management (CRM) is being entrusted to a computer application and network. The focus on end-user driven development is posing questions on how to overcome traditional barriers between the user and the developer and how to assess interactive technology using a human reference standard. However

challenges include language and cultural localisation, costs effective implementation, accessibility and ethical considerations of using people in usability testing.

The increasing demand for resilient automated e-business and the associated capability to integrate end-user psychology with technology calls for the wider examination of WOZ techniques. B2C self-service applications of the future will, like the Tinman, need to have a heart. It is hoped that this article will have at least done something to widen the yellow brick road.