Chapter 7

VOICE MESSAGING USER INTERFACE

Harry E. Blanchard and Steven H. Lewis
AT&T Labs, Middletown, NJ, USA

Abstract: Voice mail is certainly one of the most common interactive voice response (IVR) applications in telephony. When we talk of designing these systems to be easy to use, there is much overlap with general IVR system design, but there are also significant special characteristics to voice mail systems. This chapter discusses designing voice mail systems for usability with particular emphasis on the special characteristics, demands, conventions and standards associated with voice mail. Touch-tone interfaces are still the norm in messaging, but this chapter also surveys continually emerging innovations: novel prompt and menu structures, automatic speech recognition, unified messaging, and multimedia mail.

Keywords: voice mail, voice messaging, unified messaging, universal mailbox, voice user interface dialogue design

1. INTRODUCTION

Voice messaging, or voice mail, is a computer application integrated with the voice telephone network that allows people to receive, send, and store recorded audio messages. From modest beginnings in the early 1980s as a replacement for answering machines in business environments, voice messaging has grown to become an essential business tool and an increasingly common consumer service. At the end of 1998, a good estimate of the popularity of voice messaging can be seen in the U.S. number of mailboxes, with about 60 million business “seats” with mailboxes, an additional 12 million or so residence lines with call answering mailboxes, and some 6 million or so mailboxes behind cell phones and pagers. Since 1998, there is no doubt that the number of mailboxes for cell phones and other mobile devices has grown significantly. Numbers for the rest of the
world are harder to come by, but the total international market for voice messaging has been estimated by some of the equipment makers as about as large as the U.S. market. Millions of calls each day are answered by voice messaging applications and retrieved by mailbox subscribers.

The typical voice messaging application is controlled by users entirely from a conventional touch-tone telephone. Thus, voice messaging applications fall into the class of Interactive Voice Response (IVR) services; most are touch-tone user interfaces. As many have noted, the touch-tone, or DTMF, user interface is impoverished, both in the user input, which is limited to the 12 keys on the standard touch-tone telephone, and in the system output, which places large processing demands on users because of its serial audio nature.

It is useful to think of voice messaging as services built from a set of messaging capabilities. These include:

1. **Call answering**: When the user doesn’t answer a phone call or is busy on another call, the voice mail system answers the call and can take a message. This function is parallel to the capability provided by a telephone answering machine, except that the voice mail system can take messages while the user is talking on their telephone and is able to provide the caller with various options (although some devices can also provide the former capability in conjunction with network features).

2. **Message retrieval and management**: As with answering machines, voice mail allows users to play messages left for them, and it allows them to store those messages and play them back later.

3. **Sending messages**: Voice mail systems can provide a functional analogue to e-mail that an answering machine cannot: the ability to record messages in the voice mail application and send them directly to other user’s mailboxes on the same or connected systems. Sending can be invoked by subscribers who originate messages or who reply or forward to messages they receive.

4. **Call delivery**: Another form of voice messaging intercepts calls in the network that are not answered or the line is busy and offers the caller a chance to record a message to be delivered later. The system then keeps trying the line and delivers the message to a person or an answering machine when the line becomes free.

5. **Bulletin boards**: In this form of voice messaging, mailboxes do not belong to individual subscribers but rather are used by many people to leave and retrieve semi-public messages. This form of voice messaging is not common in the U.S.