Chapter 16
Automated Telephone Services in Dentist Appointment Management

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ABSTRACT
Reservation of health care service appointments has traditionally been performed through telephone. This takes a lot of time and resources at both ends of the transaction, and can be error-prone. Especially dentist appointments are standard as compared to many other health service provision activities, and are thus a natural candidate for rationalization through modern information technology. Appointments can of course be made through the Internet, but using phones, especially mobile phones, adds flexibility to the performing of the transaction. In this article we take a look how the middle-sized Finnish city of Lahti has taken a comprehensive approach to develop new innovative services in dentist appointment management.

INTRODUCTION
Dentist health services are very transaction intensive. As related to the actual care-taking activity, transactional activities such as reserving, cancelling and rescheduling activities consume a lot of the patient and staff time, as compared to many other fields of health-care. Visiting a dentist is maybe the most routine and frequent healthcare activity most healthy people in the working age perform. All this has made dentist appointment scheduling a good candidate for automation and re-engineering efforts through telephone-based innovations. This article reports on two systems that have been implemented in the City of Lahti, a 100 000 inhabitant city in Finland, to take care of dentist appointment management activities.

DOI: 10.4018/978-1-60566-733-1.ch016
RELATED TECHNOLOGIES

Appointment scheduling for dental care can be seen as a call center. The efficient handling of the large masses of calls and other contacts would be impossible without good computer-telephony integration. Next we shortly discuss these two concepts that form the cornerstones for the applications in Lahti.

Call Center Management

A call center is an organizational department responsible for handling customer service issues by telephone and other channels (Laudon and Laudon 2006, 97). The British Call Center Association defines a call center as follows (Call Center Association 1999): “a physical or virtual operation within an organization in which a managed group of people spend most of their time doing business by telephone, usually working in a computer-automated setting.” The Pennsylvanian administrative office for public safety radio services has the following definition for a call center (Public Safety Radio Services 2008): “A call center is a central place where customer and other telephone calls are handled by an organization, usually with some amount of computer automation. Typically, a call center has the ability to handle a considerable volume of calls at the same time, to screen calls and forward them to someone qualified to handle them, and to log calls.”

Call center operations are divided to inbound and outbound activities. As the name says, inbound call centers handle incoming phone calls. Typical inbound call centres are help desks. Outbound call centers themselves take the contact, often for example in marketing purposes. Performing surveys and other type of research over the telephone is also a typical task.

Stolz (2004) defines a call centre as follows: “an organisation or a unit, located at a geographical distance from its customers and/or principals, that handles inbound or outbound calls in order to answer questions from customers or clients or in order to gather information for a certain activity. Communication with customers includes the use of telephones as well as modern communication media, such as e-mail and chat. Further, call centre activities can be performed either in-house, which refers to services that are provided internally within an organisation, or outsourced, which means that the call centre attends to other organisation’s tasks.”

The academic and professional discussion on call centers is concentrating very much on working methods in call centers, and on the viability of call centers as working places. A dominant conclusion seems to be that badly managed call centers can be frustrating working places. Thus, automatic speech recognition might be a very good idea, in order to free workforce from boring routine tasks often available in call centers. However, the adoption and acceptance of call centers and especially computerized speech recognition by customers seems to be very scarcely studied in academic literature.

Computer-Telephony Integration

Computer-Telephony Integration (CTI) refers to systems that enable a computer to act as a call center, accepting incoming calls and routing them to the appropriate device or person. These systems can handle a variety of incoming and outgoing communications, including phone calls, faxes, and Internet messages (Public Safety Radio Services 2008).

Call centers are supported by computer-telephony integration, which is integrated and works together with the following technologies too, among others (Yarberry 2000):

- Automatic call distribution (ACD)
- Interactive voice processing
- Workflow
- Predictive dialers
- Image processing