A SYSTEM FOR TELE SERVICE DELIVERY IN REHABILITATION DEDICATED FOR DISABLED USERS AND THEIR CARERS USING DE-4208 RESORT INTERFACE

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Abstract: **The experiences and results of the DE-4208 RESORT project (1998-2001) which has developed a state of the art prototype system for tele service delivery for Rehabilitation Technology (RT) products are described. The RESORT approach provides innovative facilities for delivering tele-support to disabled users of PC based RT including their care persons in order to reduce existing barriers in daily usage and service of RT. For single switch (scanning) users RESORT ensures synchronisation also over narrow bandwidth network channels. The scaleable user interface is described and the remote service interface is explained which can be used by already existing other RT software products. Thus they can benefit from tele help functionality provided by the PC-based RESORT system. RESORT stands for Remote Service of Rehabilitation Technology.**
Keywords: **tele help, tele rehabilitation, service delivery, assistive technology, AAC**

Introduction

An increasing number of disabled people is using Rehabilitation Technology (RT) systems which help them to live more independent and self-determined lives. Installation of an RT system is the starting point of a process of continuously tailoring the system to the ever changing needs of the individual user. In many cases the care persons (teachers, therapists, family members) are the key agents in this process. Often a lack of experience in using and configuring RT systems causes a resulting lack of adaptation and frequently the total abandonment of Rehabilitation Technology. The actual use of RT systems is much lower than the real need. Currently support is a complicated and expensive procedure due to high travel efforts and to frequent hands-on involvement of professional support personnel. The RESORT tele help system aims to overcome this situation by providing means for tele help and remote service functionality dedicated to disabled persons and their carers [1].

Materials and Methods

The tele help prototype system developed by the EU's DE-4208 RESORT (*Remote Service of Rehabilitation Technology*) consortium provides the following functionality: (a) RCI (Remote Control Interface) for "real time synchronisation" of two RT systems, one with the disabled user and one at the location of the service provider (b) easy-to-use scaleable User Interface (c) real time communication and interaction: audio and video (d) database access (e) file transfer (f) synchronisation of file systems (g) text communication (h) security. It offers three different modes of operation: (1) hands free communication between user and service provider with optional video link; (2) student-teacher mode for real time synchronisation of RT systems which is important for single switch users over links with narrow bandwidth; (3) tele-service-mode for technical maintenance.

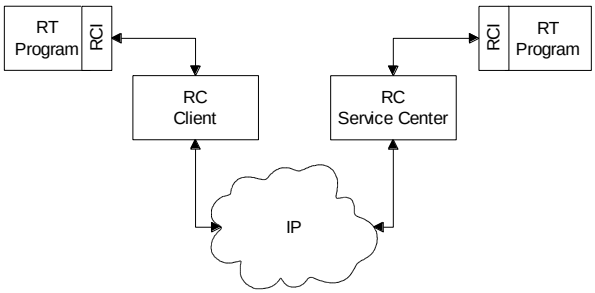

Figure 1: Remote Control Interface (RCI) between RT software application and RESORT Controller (RC) software running on client and on Service Centre side

Figure 2: RESORT Client during a Tele-Service session

The RESORT system exploits existing technologies for tasks like video / audio transmission according to

H.323 specification and desktop/application sharing according to ITU T.120. The user interface of the RESORT controller can be tailored according to the needs of the users. The RCI (Remote Control Interface) and the RESORT protocol allow synchronisation in real time. This is possible as only small data messages are transferred instead of changed screen contents. This method dramatically reduces the required bandwidth [2] and enables the RESORT system to provide real time monitoring of single switch users.

Figure 3: Viennese non-speaking head stick using person working with an RT system called AUTONOMY [3] which is remotely supported via RESORT

Results

In order to test and demonstrate the benefits two existing RT systems [3], [4] have been equipped with RESORT interfaces. Results from real life tests have shown that the system was usable by disabled people and their primary carers. Furthermore, both primary and secondary carers consider the system a viable tool for the delivery of support for users of RT systems. When demonstrated to care service providers, they were particularly interested in the potential for rapid access to engineering and technical support. They also saw great potential for online conferences involving a group of different care providers involved with an individual client. It was recognized that RESORT would cause operational changes in the care services.

Discussion

Additionally to the RESORT prototype software, the RESORT protocol and API (Application Programme Interface) have been developed and documented [5]. This allows other manufacturers to integrate the RESORT API in their products in order to strengthen their position in the market. RESORT not only aims at technical service delivery but also at pedagogic and therapeutic support via the telematic channel. In order to ensure ongoing research and development a RESORT Interest Group (RIG) was set up. It provides a framework for disabled users, care persons, manufacturers, service providers and researchers to continue the engagement in the area of remote service provision.

Table 1: Tele Service Sessions over 64 kbps ISDN link

#	Date	Duration [Minutes]	Successful	Problems	System Version
1	24.10.01	48	yes	none	0.5.1.2
2	12.12.01	9	yes	none	0.5.1.2
3	12.12.01	11	yes	none	0.5.1.2
4	18.03.02	5	yes	none	0.5.3.10
5	03.05.02	13	yes	none	0.5.4.15

Conclusions

An evaluation version of the RESORT software package is available on RIG home page [5]. Tele support and remote service delivery are emerging fields with many encouraging aspects and possibilities [6], [7], [8] which will improve significantly the quality of life of disabled persons.

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