Summary of:
A personal digital assistant application (MobilDent) for dental fieldwork data collection, information management and database handling

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Objective To develop a personal digital assistant (PDA) application for oral health assessment fieldwork, including back-office and database systems (MobilDent). **Design** System design, construction and implementation of PDA, back-office and database systems. **Methods** System requirements for MobilDent were collected, analysed and translated into system functions. User interfaces were implemented and system architecture was outlined. MobilDent was based on a platform with .NET (Microsoft) components, using an SQL Server 2005 (Microsoft) for data storage with Windows Mobile (Microsoft) operating system. The PDA devices were Dell Axim. **Results** System functions and user interfaces were specified for Mobil-Dent. User interfaces for PDA, back-office and database systems were based on .NET programming. The PDA user interface was based on Windows suitable to a PDA display, whereas the back-office interface was designed for a normal-sized computer screen. A synchronisation module (MS Active Sync, Microsoft) was used to enable download of field data from PDA to the database. **Conclusions** MobilDent is a feasible application for oral health assessment fieldwork, and the oral health assessment database may prove a valuable source for care planning, educational and research purposes. Further development of the MobilDent system will include wireless connectivity with download-on-demand technology.

EDITOR'S SUMMARY

Knowledge allows us to progress and develop ideas and actions based on answers to questions. Do people have caries? How many have carious cavities and of what size and extent? Do we need to provide a service to deal with this problem? How big should the service be? And so forth. The essential link in this process is the gathering of data and, relatively mundane as it may seem, the efficient recording, transmission and storing of it.

In dental practice we are coming rather late to the concept of learning lessons from patterns of disease, changes in behaviour and trends in treatment, all of which can be gleaned from careful recording and subsequent analysis of data. This is perhaps surprising given the oft quoted scientific basis of our craft and the increasingly emphasised evidence-base for our work. The esca-

lating use of practice software means that a large amount of recorded material now exists that previously resided in fractured and unconsolidated form as millions of paper-based records in thousands of filing cabinet drawers. Much more could be made of such a rich source of information and the continuing drive towards better services and improved value for money will almost certainly make greater use of this to inform health care advances and business choices at the levels of individual practices and larger organisations.

This paper specifically looks at the technology available to log data at a distance from the surgery or practice and details how it might be applied to current situations and be further developed for future uses. While acknowledging that this will not be of immediate use to all readers, the paper has a place in the literature in providing us pause for

thought that dentistry is changing in its service provision and will therefore require new solutions to consequent challenges. There will be ever greater expectations of us as a profession to be flexible and awareness of technological solutions to enable such developments can only be to our advantage.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 205 issue 9.

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IN BRIEF

- Describes the development and application of a novel PDA concept in dentistry, with a unique back-office system and dental health epidemiology database.
- The system interfaces are easy to translate to different languages and applications.
- The concept has unique applicability in areas with few dentists or dental hygienists, since large populations may be screened by relatively few dental professionals.

COMMENT

Personal digital assistants (PDAs) are increasingly used in all areas of human endeavour. However, as the authors of this paper comment, 'PDA applications for dental practice are scarce.' This may well be in part because, notwithstanding the growing numbers of corporate bodies providing dental care in the United Kingdom and some other European countries, in general it is delivered in privately owned practices where there are rarely more than five dentists and the total staff usually number less than 20. Most practices do not offer domiciliary care for their patients and use personal computers for practice administration and, in some cases, clinical support.

The advantages of the use of PDAs for recording and storing clinical information when working away from a clinic or practice, and for patient and practice administration, are clearly outlined in the discussion section of this paper. It appears that the use of PDAs has simplified and streamlined the provision of domiciliary dental examinations, patient records and administration in four Swedish counties and has delivered a number of benefits, including:

- Clear and comprehensive patient assessment records
- A database of clinical information for epidemiological research and on which to plan for the provision of and resources for the care of one section of the community
- Clear and concise instructions to patients and carers on oral hygiene and proposed treatment
- Improved likelihood of integrating oral healthcare with other aspects of medical and social care
- Improved scheduling of appointments for patients
- Simplified billing for services provided.

The authors explain that future developments for the system are likely to include the incorporation of continuously updated online evidence-based information for use by clinicians, by patients and by their carers, oral hygiene education for carers and nurses, and wireless conductivity to the database. They also claim that 'the system could easily be modified for applications outside the dental field, for example for bedside patient data registration at nursing homes or in hospitals.'

Sadly, the earlier parts of this paper that describe the technical aspects of the system are rich in computer jargon, which may deter some readers from reading through the paper to the discussion, where the most useful information for clinicians and administrators is to be found.

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AUTHOR QUESTIONS AND ANSWERS

1. Why did you undertake this research?

This study was initiated because we discovered an urgent need for a reliable and data secure system for patient data management in outreach dentistry. Previously, the administration involved in oral health assessments has been time- and effort-consuming. Only hand-written sheets or printed documents were available for the outreach dentistry fieldwork. Therefore, in order to secure the quality of the data and to shorten the time-span from diagnosis to provided treatment, our objective was to develop a PDA-based system suitable for oral health assessment fieldwork, including back-office administration and database systems, applicable in a world-wide context.

2. What would you like to do next in this area to follow on from this work?

It is of interest to apply and explore the global potential of the MobilDent system in developing countries. For example, collected data from epidemiological fieldwork may be used for prognostic purposes, and when dental clinician requirements and resource allocations within certain geographical areas are planned.

In this context it is important to remember that the MobilDent system could be easily modified for applications outside dental fieldwork, for example for bedside patient data registration at nursing homes or hospitals, or in epidemiological fieldwork. The future technological development of the MobilDent system will also include wireless connectivity to the database.