

Management Systems: The Glue that Holds a Practice Together

+ Claudio M. Levato | DDS

It is interesting to look back at the amazing rate of transformation in dental technology over the past several decades. When the author began practicing upon graduating from dental school in 1976, the virtually continuous rate of change that would occur with new technologies and applications¹ was unimaginable. Back then, dentists completely depended on the written word and paper charts to document their professional services. Accounting and billing systems were primarily a pegboard system with carbon paper.

Computers were first used in dentistry in the late 1960s as an accounts receivable solution.² By the 1980s practice management software programs evolved that helped dental practices tackle most of the administrative, billing, and scheduling applications. Clinical charting and the incorporation of imaging applications soon followed, which was the beginning of the digital patient record.

In 1998, the American Dental Association (ADA) developed guidelines for clinical systems that include the acquisition, storage, retrieval, presentation, and communication of computerized patient information.³ In 1999, the ADA Board of Trustees approved the ADA Standards Committee Operating Procedures. The ADA Standards Committee (SC) has two divisions: SCDP (Standards Committee Dental Products) and SCDI (Standards Committee Dental Informatics). The SCDI currently has four subcommittees with 18 working groups, consisting of voluntary members of industry, academia, and private practice working together to develop consensus standards. All documents developed by the ADA SCs are eligible to become approved American National Standards or registered as ANSI Technical Reports. In 2001, ANSI/ADA

Specification No. 1000 was approved as an American National Standard; it provides a blueprint for the logical architecture of health information systems at the data level. This is a voluntary standard and as such does not truly mirror what is available in the actual market.

While it has been difficult to gather actual hard data on the number of dental practice management systems in use over the past several decades, Dr. Gordon J. Christensen's *CRA Newsletter*, later named *Clinicians Report* (www.cliniciansreport.org), has conducted four surveys on practice management software programs.⁴⁻⁷ These surveys illustrate the consolidation of programs and the shift from DOS to Windows programs. The typical client/server systems that dominate the market today are controlled primarily by three large publicly traded corporations: Dentrix® and Easy Dental® from Henry Schein, Inc. (www.henryschein.com); Eaglesoft from Patterson Dental (www.eaglesoft.net); and Softdent and Practiceworks from Carestream Health (www.carestream-dental.com) (formerly Eastman Kodak Company's Health Group), an independent subsidiary of Onex Corporation. In 2008 these three corporations accounted for 82% of the desktops⁷ (Figure 1).

TYPES OF DENTAL SOFTWARE

There are many types of dental software. As early as 1986 Zimmerman⁸ categorized types of computer software, depending on their task: administration and management of patients' documentation; electronic archives of the documentation; telecommunication; computer-aided education; computerizing instruments; dental office software for clinical decision-making.

In 2003, a classification given by Kirshner⁹ proposed three main categories:

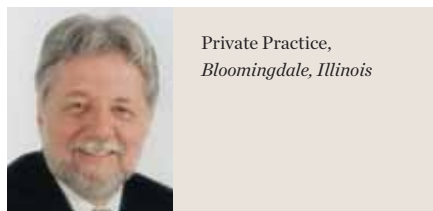
administrative, clinical, and Internet, with specific applications falling under one of these categories. It is important to realize that all classification of dental software is relative, since there is such great variability in the focus and tasks of the individual products. In the author's opinion, dentistry will continue to see an explosion of software applications to address just about anything that a clinician may come across in practice. The challenge becomes one of integration and support.

The Internet has become an integral part of dental software, just as it has in almost every industry. Virtually all of the existing practice management programs have integrated web-based applications that significantly improve the function and flexibility of the system. In today's reality, office-based and web-based applications are needed for optimization of this technology. A hybrid solution of both configurations with an eventual migration towards a complete web-based solution is the most probable outcome in the not-too-distant future.

Currently, the wide range of dental management software can be encompassed in five categories:

- > ***In-office client/server hardware with single practice management software, with seamless integration of clinical applications and integrated web-based applications.*** Eaglesoft and Dentrix are examples of this configuration. Dentists can purchase the software and all the hardware components, including computer hardware, imaging products, installation, training, support, and web-based back-up solution, from a single source. One-source solutions are possible because the parent companies of these programs are the two largest full-service dental companies in the industry.
- > ***In-office client/server hardware with***

Claudio M. Levato, DDS



practice management software, connecting to clinical applications with a bridge or name-grabbing software; may also have some integrated web-based solutions. This may be the most common solution in current practice. Many dentists have perhaps already purchased practice management software and digital radiology sensors from different sources, which can be connected with a bridge. This level of integration can vary significantly and is dependent on both vendors accommodating future upgrades of their software so that the bridging of the data continues without interruption.

➤ *Web-based practice management software that can be accessed by any Internet connection.* This relatively newer format is generating significant interest because it is typically a subscription-based service that eliminates the need for servers, in-office upgrades, and back-ups. These systems are not as robust as the more established in-office client/server systems but are capable of handling the required practice management features. An example of this technology is

Curve Dental (www.curvedental.com), which recently released its image management solution that allows dentists to capture x-rays using almost any sensor. When the office captures a radiographic image, it is saved directly to the system's "cloud" storage. Once saved to the cloud the image is then pushed back to the local computer where it can be viewed, manipulated, or printed.

➤ *Value-added software applications that utilize existing data within a dentist's practice management system to enhance the performance of the practice using web-based technology.* There are many third-party software companies that additionally mine the data from a clinician's existing practice management system to automate processes or push data to the clinician's staff for task optimization. An example is Lighthouse 360 (Lighthouse Practice Management Group, www.lpmg360.com), which automates the recall or recall system of a dental practice by confirming appointments by text, e-mail, or postcard based on a patient's preference. The system also provides doctors up-to-date demographic information on new patients, appointment book access via the Internet, e-mail surveys and newsletters, and many other features. Another example of a specific function is ActionRun (ActionRun, Inc., www.actionrun.com), which focuses on a practice's inactive

patients using a system of letters to reactivate them.

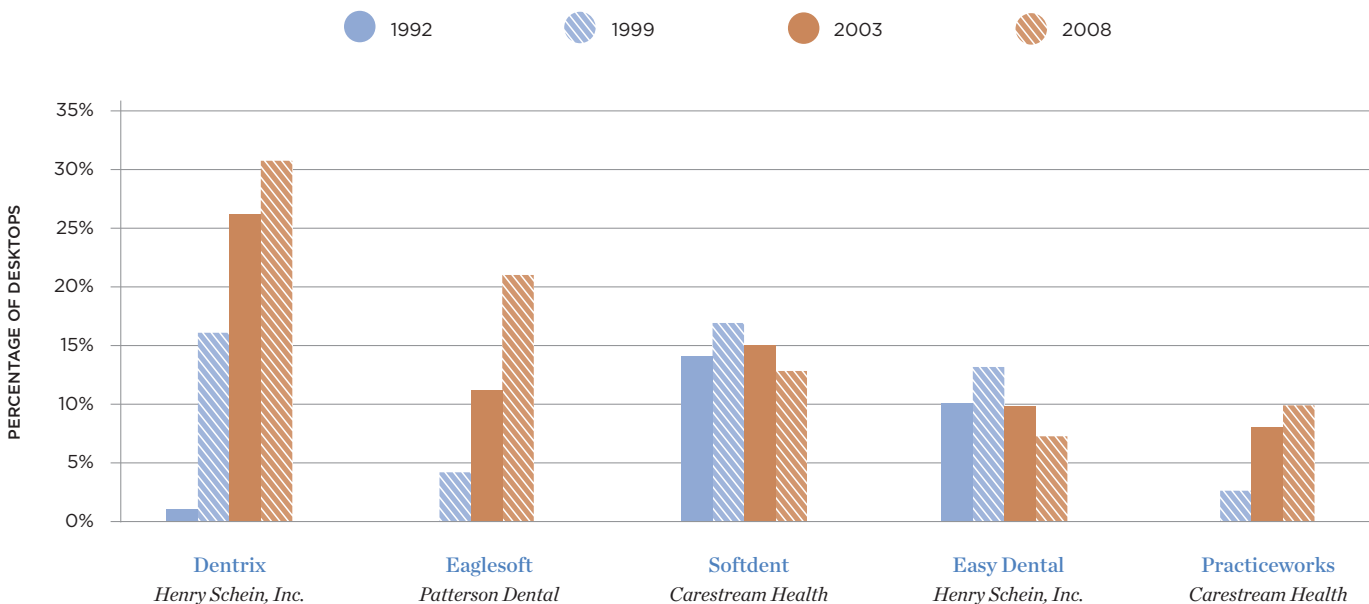
➤ *Independent task-specific software applications, ie, patient education, consultative and treatment planning, 3-dimensional (3-D) image management and transfer, etc.* In addition to practice management software systems, many independent task-specific systems are available. These programs are usually purchased individually for very specific applications. For instance, CAESY[®] and Guru[™] are the patient education programs for Eaglesoft and Dentrix, respectively. They can be purchased as stand-alone patient education systems regardless of which practice management program a dentist uses.

APPLICATIONS AND BENEFITS

Dental practice management software is the glue that holds a practice's functions together. The vast majority of dentists are using computers in their office for basic administrative and bookkeeping applications, with many incorporating electronic claims for dental reimbursement. In this sense the hybrid component of both office-based and web-based applications is needed, even in practices that have not incorporated clinical workstations. The ultimate goal should be a complete digital patient record that can seamlessly integrate all the clinical and administrative functions with a fully

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Fig 1. CRA/Clinicians Report Practice Management Software Survey Results⁷



relational database that can be queried for data analysis.

While all of this is possible today, it is not easily accomplished because many dentists have purchased hardware and software applications that are not fully integrated into a single source. This lends itself to separate databases that cannot always be bridged together. Since there are so many dentists at different levels of integration and no universally accepted integrative standard, the industry is left with many different solutions that are incomplete.

While ANSI/ADA Specification No. 1000 addresses the standardization of software and its components, it may seem as though software companies are ignoring this specification, because interoperability among systems is such a monumental challenge. The ANSI/ADA Specification No. 1000-2010, released last year, is the second version of this standard. The original standard was never very well deployed, enforced, nor adopted. It focuses primarily on architecture for the structure and content of electronic health records and is actually relatively specific about what and how data should be stored. However, most practice management software companies have already deployed a model that is similar to yet different from this standard, and to migrate fully to the standard would be a major undertaking.

It has always been the author's bias that an open architecture for the digital patient record would be the best solution, but this has not been realized in the current environment. Also, there are fundamental economic challenges with an open system. In the capitalized world, it takes time, energy, and money to create intellectual property, and that investment requires a return. It is philosophically incongruent for most businesses to share the results of their research and development, thus a third party is needed to push for change in a neutral environment that respects the investments and challenges of all parties.

Even within the same practice management software program, it has been difficult to develop an intuitive, easy-to-use clinical patient record. A recent study¹⁰ at the University of Pittsburgh evaluated four major dental software programs for usability and accuracy and found that there are significant difficulties for novice users,

which raises concerns about the quality of documentation in clinical practice. The study underscores the importance of ongoing staff training to maximize the benefits of a practice's particular system.

INTEGRATION INTO THE PRACTICE

Integrating any software application into a dental practice is highly dependent on what the practice already has and what it wants to accomplish. A practice's first step should be to clarify its goals regarding needs and desires and compare this with its existing software solution. Since most practices are only using a small percentage of the applications in their existing program, it would be prudent to check with the current vendor to see if its latest version would meet the practice's expectations. If so, upgrading the practice management program and purchasing some staff training may be the best solution. Changing practice management software systems can typically be traumatic and requires data conversion and training. This will disrupt an office's normal routine, and the decision to make the change should be done only after serious consideration.

Before purchasing, some basic considerations include:

- For first-time dental practices just starting out, a web-based practice management solution is recommended because "cloud" applications provide greater flexibility and reduced initial costs.
- For offices that are already paperless and are utilizing a major portion of their practice management program, the web-based practice management solution may not replace all their applications and, therefore, may be inadequate.
- If ongoing hardware and networking challenges have been primary frustrations, the complete web-based solution will address these issues and may be worth exploring.

CONCLUSION

In general, dentists have limited business training and education; they've invested heavily in developing clinical skills and are predominantly focused on delivering healthcare. Technology is an excellent tool to bridge the business-patient gap, offering proven systems to support dentists' ability

to serve their patients well. With the ever-encroaching federal mandates in healthcare and the drive towards a digital patient record, dentists need a partner in protecting their practice data and for complying with government regulations. This is the role of a practice management system, thus dentists must think long-term and make sound, careful decisions along the way.

Dental practices should master the current program they already have purchased. While dentists do not need to be the in-office expert on the software, they should invest in staff training so that the office becomes competent in all the features already available. Dentists should start thinking more in terms of information technology (IT) that will perpetually require updating and training rather than just owning a computer system. A new discipline called "dental and medical informatics" is the study of computer science as it relates to healthcare; this will become much more than a recordkeeping modality. Rather, it will become more of an artificial intelligence system to help dentists improve the quality of care by implementing best practices as determined by objective data.

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