

# TECHNOLOGY

## INTEGRATION

*The why, the how, and the now.*

### A Subjective Overview of Digital Integration

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*Digital integration* is a topic about which I am very familiar. Although I have been writing about it since 1995, I am still asked to pen some brilliant thoughts on the subject. So, it surprises me that, over the last decade, we haven't seen a more dramatic increase in the incorporation of digital imaging—or technology in general—into dental practice.

As I pondered why, and how best to go about finding the answers to this question, my first thoughts took me back to my initial introduction to digital radiology. I was taking C3 (third level) at the Pankey Institute in 1991, where they had a TROPHY digital radiography system. It allowed us to take digital x-rays without film, view them immediately, and then print them out on thermal paper. This experience was as exciting for me as it must have been for Professor G.C. Roentgen in 1895, when he observed the transparent image of his hand that introduced the world to x-rays and the birth of radiology.

The first digital image I saw had significant limitations compared to the intraoral images we have come to expect in excellent dentistry. However, the birth of a new medium that could revolutionize our profession and improve diagnostic capacity was now within our grasp.

All professions and occupations have a group of individuals referred to as early adaptors or, as others prefer to call them, “the Bleeding Edge.” This group immediately sees the opportunities and advantages of a new paradigm and jumps right in, with very little thought to practicality, reliability, cost, or, as the rest of the world sees it, “common sense.” I, along with a few thousand of my close friends, fell into this category and dove right in.

Now, 13 years later, I am still amazed that less than 22% of our professional community embraces this technology. The risk for dentists today to integrate technology pales in comparison to the risk taken by those early adaptors. In the early days, there were no companies that could put it all together for us and support it. The dentists that successfully integrated practice management, digital radiology, charting, and intraoral cameras did so by working with multiple vendors and

having the patience and dedication to learn the hard way what worked and what did not. (A minor side note: the cost for computer technology in the early 1990s was extraordinarily higher than it is today, and for less powerful systems.)

So, I began to ponder the status of digital integration and decided that my reference point is very biased. If I was to present an overview, it would be helpful to have additional insights. Therefore, I queried a number of dentists I know, ranging from new dentists and non-users to old dinosaurs like myself who have been early adapters and educators. The responses were very interesting and strongly reflect the individuals' subjective experience with technology and why they are or are not integrating digital technology at this time. I also queried several software companies for a different perspective. Their responses are unedited in Table A.

#### #1. What do you see as the current road blocks to digital integration?

It was readily apparent that everyone acknowledged the presence of obstacles or road blocks, and three main issues came up consistently:

- Incompatibility of systems
- Cost
- Confusion

#### #2. What are or were your reservations about integrating digital technology into your practice?

A little more insight into the digital maze as it exists today was garnered from this question. Issues include:

- Image quality compared to film or analog technology
- Impact on current practice productivity during learning curve and beyond
- Staff reaction and capabilities
- Information Technology (IT), networking and operating systems, software upgrades, and compatibility with some of the proprietary imaging software
- Loss of data due to hardware malfunction
- Cost and return on investment (ROI)

#### #3. How much of what you read or see concerning integration do you feel is hype?

The range of responses was mostly negative. From those who are more knowledgeable and have extensive first-hand experience, the responses were much more critical and discriminating of the written word. Many marketing pieces are trusted very little, and the level of trust with speakers is dependent on the subjective relationship with that speaker. Most people, including dentists, have an invisible “hype” alarm that readily goes off when they receive incongruent information. Even if that information is valid, the source may not be credible if the communication is unclear.

#### #4. What would you have liked to have known before making a decision to integrate your office systems?

Interesting comments include:

- Who the most knowledgeable and articulate authority is
- Would have done it sooner had they known how it impacted their practice
- The ongoing costs of upgrades for hardware and software
- Backward and forward compatibility, data migration, or conversion capabilities
- Stability of vendor's service record, reliability, and upgradeability
- “Plug and Play” capacity of different applications
- Interoperability of different systems and established standards

#### #5. What questions would you want to ask the major practice management systems (PMS) vendors in order to make a better decision concerning what or which to go with?

- Can I transfer my data and images seamlessly into other software programs?
- What imaging systems do you integrate into your PMS, not bridge into?
- What are all the purchasing costs and ongoing costs of your system?
- Give me straight honest answers that can be backed up.

#### #6. If you have not taken the digital plunge, why?

- It does not add significant performance value.
- Cost is really high for a poor ROI.
- Digital radiology is a convenience, not a necessity.
- Have had significant problems with integrating hardware and software for my practice management program; expect greater problems integrating clinical applications.

#### #7. If you have taken the digital plunge, why?

- Better data and image management
- Easier back-up of data
- “Wow” factor for patients
- Radiation reduction
- Decreased pollution
- Love what technology does for my practice
- Time and effort saver
- Convenience
- Electronic communication

#### #8. Whom would you trust in advising you concerning purchasing or integrating technologies?

This question obviously has only one correct answer, and since I sent out the questionnaire, I got to fill in the blanks. There is no single source, and the practice philosophy, demographics, cash flow, staffing, etc., are so individual that the responses reflected the numerous differences that must be addressed. The common thread was to find an objective resource with a knowledgeable understanding of multiple vendors that could help identify the most compatible system based on the individual needs and desires of the purchasing dentist.

#### #9. What would you want to know more about to help you make a decision?

This question was somewhat ambiguous and redundant, but it did illicit several responses that are worth noting. The simple truth is that we want to make decisions clearly and simply, without weaving through a maze of information that cannot be readily verified or

**Table A: Practice Management Digital Integration Questions**

QUESTIONS:	COMPANIES' RESPONSES:			
	Patterson-EagleSoft	Dentrix	Mogo	Kodak Dental Systems
<b>1. How many in number and percentage of your current user base are using an integrated platform where they have workstations in the operatories?</b>	6,500 or 50% have both practice management and clinical software.	Our own research shows about 67% (15,000) of our current users have workstations in the operatories and are using clinical software in their operatories. This number is corroborated by CRA's research that shows 66% of our customers utilize the DENTRIX clinical charting features, twice as many as any of our customers. See CRA News February 2003. A significantly high number of doctors using our software in the operatories—relative to our competitors—indicates that software has pinpointed a user interface that is accepted by the user and works.	The MOGO program includes all features at no additional charge and a multi-user license allows unlimited workstations. Since we have no need to license clinical or imaging separately, we do not have a means of tracking exact numbers and percentages in this instance. Clients have the freedom and opportunity to use any feature of the program whenever they choose. We can estimate 20% of MOGO clients have computers in the operatories, but since a multi-user license has unlimited workstations, this is only an estimate.	Approximately 35% of our current user base of practice management and digital radiography customers have workstations in their operatories.
<b>2. How many in number and percentage are using digital radiology?</b>	5,000 or 38% have purchased digital radiography integration.	About 41% (9,500) use digital radiography. Of all the estimated total US practices that use digital radiography, Dentrix practices using radiography represent over 37% of this entire group. This data illustrates Dentrix's technical expertise in digital imaging.	Since MOGO has all-inclusive features and the imaging module is included at no additional charge, we do not have the means to know who is utilizing the digital radiology. The only known MOGO clients that are using digital radiology are the clients who call in for tips or "how to's" on digital radiology. Our estimate is that 10% of our clients are currently incorporating digital radiology, although this trend is increasing in numbers rapidly.	Approximately 17% of our customer base is using digital radiography.
<b>3. What training is provided, and what is the cost?</b>	Training is purchased per day. At least one day of clinical training is recommended at \$1,080 per day.	Typically, new customers will purchase up to 20 hours of in-practice training for \$2,000. Training quality is regulated by a certification process. Current customers purchasing the Dentrix imaging module or imaging equipment require less training, of course.	MOGO provides over 20 hours of multimedia training at no additional charge. This training program has been well-received by our clients. Other training methods are available but rarely needed. Modem or office training is available at approximately \$100 per hour.	One-day on-site training is provided to our digital radiography customers at a cost of \$1,495. Various training options, both on-site as well as live, online training are available. Prices range from \$995 to \$4,995 depending on the number of classes and office locations.
<b>4. What support is provided, and what is the cost?</b>	Customers of EagleSoft Service Club receive unlimited phone and email support, access to an online searchable knowledge base and annual software updates. Price for multi-user license with clinical is \$1,440 annually.	New customers receive 30 days of toll-free telephone support without charge. Thereafter, our customers can choose between two different plans: (1) Our Dentrix Classic Customer Service Plan provides toll-free telephone support, all upgrades for the DENTRIX practice management system, customer tips and tricks newsletter, and basic webpage for \$1,099 annually; (2) Our Dentrix One Source Customer Service Plan, at \$1,895 per year, provides all of the benefits of the Classic plan, but is a blanket of support for all of our products and services, not just the DENTRIX practice management system.	MOGO's philosophy is that from the software perspective, support should be all-inclusive. We encourage our clients to incorporate all of our advanced features into their practice. Annual support for multi-user license is \$990. There is never an extra charge for support on advanced features, such as clinical or imaging areas.	Technical support is provided by way of a 1-800 toll-free support line for our practice management customers. Support price is \$111 per month and includes all software upgrades and maintenance releases. Digital Radiography products are serviced by our Kodak Advantage Plan which provides for next day replacement of sensors at a price of \$49 per month for the first sensor and \$19 per month for each additional sensor.
<b>5. Do you have user's groups and other vehicles for office education?</b>	Yes. Patterson EagleSoft offers user groups and seminars both locally and at dental trade shows, as well as continuing training nationwide through our Practice Masters seminar series. In addition, offices can purchase additional days of refresher training.	Formal Dentrix user's groups are beginning to take shape all across the country. At the moment, they are only available in San Diego; a plan is being developed to roll the San Diego model out to the rest of the nation. Additionally, Dentrix offers training seminars in major metropolitan areas where staff can receive additional training and earn CE credits.	We offer several local and national user meetings to allow our users to participate in demonstrations and discussions with other users. The significant feedback MOGO receives from these meetings allows us to enrich the MOGO program and customer service. We also provide quarterly newsletters, along with current multimedia training, with every version update for no additional charge.	Kodak holds yearly Users' Meetings for its current customer base. These meetings provide a forum for existing customers to learn the latest techniques in using Kodak software to maximize the efficiencies of their dental practices. In 2005, we will hold two Users' Meetings which will allow customers to network with their peers, listen to industry speakers, learn the latest in digital technologies, and talk with Kodak developers and corporate personnel about Kodak products and services.
<b>6. Do you provide hardware, installation and hardware support?</b>	Yes. Patterson offers Patterson branded hardware that is both installed and supported by Patterson technical service. Customers using Patterson EagleSoft, integrated digital x-ray and Patterson hardware have one phone call for support.	Dentrix manages a certification program for experienced hardware integrators across the country. Nearly 200 Certified Integration Engineers (CIEs) have been trained and certified by Dentrix Dental Systems to have the knowledge and expertise to successfully install and integrate Dentrix products and services.	MOGO does not offer computer hardware but we do provide support via modem and phone. We also work with hardware technicians throughout the U.S. to efficiently support the MOGO program for the benefit of our clients.	Yes. We work with independent network solutions providers to provide installation services and network support.
<b>7. What is your vision for the optimal integration of your products and services for dentistry?</b>	The advantage of the Patterson technology solution is that customers using Patterson EagleSoft, integrated digital x-ray and Patterson hardware only have one phone number to call for support. There is no finger pointing among multiple companies over who should address the question. Also, all sales and support personnel are Patterson employees with a vested interest in seeing the dental practice grow and thrive. When practices choose Patterson as their technology provider, they are partnering with a market leader committed to their success.	Data should flow freely and automatically throughout the practice; whatever information is entered in the operatories should be accessible from anywhere in the office, and vice versa, without the use of bridges, links, or delayed by user input (e.g., export of data from one module and import into another). All of this functionality is supported by one company, providing the doctor with one-stop technical support. There is no finger pointing.	Dentists as well as staff should have the freedom of choice and participation with their dental practice management software. We design interfaces and provide them to our clients at no charge so that they may be more efficient. Our open-architecture design allows multiple digital radiology interfaces directly in our practice management program. The advanced MOGO Imaging System (MIS) provides the option to utilize direct digital photography and intraoral cameras with WDM Video Capture. The ultimate freedom for a dentist is to plug and play with any digital imaging, in any operatories, at any time. More choices create better communication between offices, patients and referring dentists. This allows for efficient office management while increasing their bottom line.	Kodak's vision is to maximize efficiencies in today's digital practices using a variety of products from within its growing practice management and digital products portfolio. Seamless integration of our practice management and digital solutions provide a simple and efficient way to access, view and share images right from our practice management desktops. Using the digital integration that Kodak products provide, dental practices can more easily realize the benefits and efficiencies of digital technologies in today's dental marketplace.
<b>8. What do you see as the current road blocks to digital integration?</b>	The biggest perceived road block is cost. In addition to the digital x-ray equipment, an office without computers in the operatories has to make a significant capital investment in computer equipment. The key word is investment; when implemented correctly, technology in the dental practice will pay for itself and will actually help the practice grow and become more profitable. In order to implement the technology in a profitable manner, the practice should create a digital plan outlining when and how different technologies will be incorporated. This plan should also include long-term planning for maintenance and planned replacement of components.	Education; a universal definition for the term 'integration' doesn't exist. What Dentrix Dental Systems terms as integrated is significantly different than that of other third-party software vendors. Dentrix terms integration as bi-directional flow of data between two different software modules; what most third-party software vendors call integration Dentrix calls a bridge, or a one-way flow of data. Doctors should understand that the efficiencies lost due to the use of a bridge are significant and prevent the doctor from utilizing their practice management software to improve efficiencies and increase productivity.	The biggest road block to digital integration is the proprietary architecture of many systems currently available, as this strangles freedom of choice. Why should your practice management software dictate which camera or DXR program you can use? Why should you be forced to purchase a "bridge" only to create a secondary database? A practice management program without an open-architecture design for digital imaging does not provide the dental professional with the freedom of choice to effectively manage their practice according to their needs.	A single source for all practice management and digital radiography solutions is viewed by some as a road block to digital integration. Kodak, however, offers a complete portfolio of practice management and digital solutions that integrate seamlessly together to create efficiencies in dental offices. Once people understand the ease by which digital integration can be obtained, more customers will make the migration to digital technologies.
<b>9. What would you want dentist to know about your company and its commitment to offer solutions for their integration needs?</b>	Patterson has made a long-term commitment to technology in the dental practice. We have built an unparalleled infrastructure to support our customers using Patterson technology. In addition, Patterson is the single source technology solution, providing all of a practice's technology needs from patient education to printers. One phone call, one company for all your technology needs.	More doctors use DENTRIX every day to integrate front and back office data than any other single competing system. Why? Because the software has more than 15 years of research and development into developing an intuitive, easy-to-use application that seamlessly integrates front and back office tasks. As the CRA report shows, DENTRIX doctors are actually using the clinical charting features because they're easy to use, which doesn't seem to be the case with other applications. Additionally, all of this wonderful functionality is backed by a technical support program that has been consistently rated number one by more than one independent survey year after year. Finally, as a Henry Schein company, doctors can invest in DENTRIX knowing the company will be one of their business partners for as long as they practice.	MOGO has been independently owned and operated by the original owner for over 20 years. Because we are client driven, freedom of choice is MOGO's philosophy. We offer our open-architecture design for imaging in this rapidly changing environment. Even within the same office there is freedom of choice, as we have several clients where one provider uses a certain DXR system in their operatories and their partner chose a different DXR system in their operatories. With MOGO's multiple imaging, you may plug and play using two different imaging platforms, whether it be intraoral, digital photography or radiology. We listen to our clients by implementing suggestions in our annual updates. MOGO is the Single Database Solution for every dental office.	Kodak has the complete portfolio of products—film, practice management, digital radiography, digital imaging, and e-services—to meet the growing needs of today's integrated digital practice. Wherever a customer falls on the digital adoption curve, only Kodak can help them to maximize their efficiencies, revenues, and patient satisfaction levels. Dentists have trusted Kodak with their dental needs for over 100 years, and we are poised to continue helping dental professionals as they migrate to the digital realm now and into the future.

supported. Dentists want simple answers to these questions:

- What do I need?
- How well does it work?
- How much does it cost?
- How long will it last?
- How do I fix it when it goes down?

People just want to know the facts and what they will get for what they spend—period. They would like the people lecturing on the subject to be knowledgeable, and I quote from one of the responses: “I want well-known technology experts to give me a simple, straightforward, turnkey, no-brainer system.”

### #10. Any other comments or concerns?

Some comments are worth printing in their entirety:

“I would like to see truth in advertising, rather than ignorance and a constant need for ‘Caveat Emptor.’ No use of theoretical specifications should be permitted; only outcomes from randomly selected devices should be used. There is a need for randomized clinical trials to determine diagnostic utility and outcomes of using the newer technologies. Such trials are woefully lacking. The ADA [American Dental Association] and similar bodies should more carefully monitor statement veracity during continuing education courses. Substance should be placed above entertainment value. There is much misinformation emanating from so-called experts. ‘Expert’ authority is known to provide only a very low level of evidence in comparison with controlled scientific evaluation.”

“If my new car ([which] cost way less than a pan and a handful of sensors) worked as marginally as the hardware, we would arrest the presidents of Toyota, Mercedes, etc!”

“If I were a new dentist or older dentist building a new office, I would probably go totally digital. My only concern would be compatibility with other systems (i.e., ability to exchange information).”

“The time is finally here!”

### CONCLUSION

Exploring this topic and writing this article has given me a new perspective on technology integration. Although I have very strong biases and could not even imagine going back to a non-digital dental environment, I did have to pause and rethink my position based on some of the observations.

The most clear and defining conclusion is that technology is not required for excellent clinical dentistry, and the fact that one uses all the latest and greatest “toys” for the delivery of dental services in no way automatically makes him or her an exceptional clinician. The other side of that coin is that if you are an excellent clinician and willing to learn the potential and limitations of new technologies and continue to implement them accordingly, you will become a better

clinician. Technology applications are additional tools that can be applied to solve problems, along with all the other tools we have picked up along the path of our clinical development.

The second observation that crystallized is that the *existing perspective* of the individual is key to making any change possible. If you firmly believe that the quality of a digital image is inferior to an analog or film image, changing your mind is virtually impossible until your perspective is open to challenge. The same is true for your ROI. If you believe you cannot afford to convert to digital, you are correct. Until your perspective is willing to be challenged, you will be unresponsive to any formula or number crunching demonstration. The converse is also true. If you believe that you can realize a positive ROI, you will be receptive to all sorts of formulas and number analysis until you find the one that fits with your philosophy. Then, implementing it becomes second nature to you.

The third observation that I came to better understand is that I, along with my fellow opinion leaders, are rarely accepted at face value, and rightfully so. Just because we have accepted a particular technology application, successfully integrated it into our practice and seen a significant ROI does not mean that someone who blindly accepts our arguments and recommendations and follows suit will receive the same benefits we did. We have to become better listeners, less dogmatic in our beliefs, and offer what we can as objectively as possible to facilitate the learning curve of others.

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