IDS 2011: The greatest show on earth

By Terry Whitty and Joseph Allbeury

Every second year in Cologne, Germany the biggest dental event on the planet takes place. No one ever prepares themselves fully for the magnitude of the International Dental Show, or simply IDS as it's known, as it makes every other trade show on the dental calendar look rather small. The statistics for IDS 2011, held in March just gone, are quite amazing - 1,950 Exhibitors from 58 countries; and over 115,000 visitors from 148 countries (according to the organizers - 185 of those were from Australia). The floor area is a staggering 145,000 square metres or to put that into perspective, roughly 14 times larger than the average ADX in Australia.

Besides a plethora of everyday lab equipment like casting machines, model trimmers, articulators, lab benches and the like, what everyone really comes to see is what's new. Everyone's looking for the next big thing; the next trend or tangent and IDS is renowned for delivering exactly that.

The number of intraoral scanning systems doubled at IDS. Above are shown the new cara Trios from Hereaus, a.tron3d and MyRay's id3. Sirona also launched CEREC AC Connect, a standalone digital impression taking system that cannot design or mill.

CAD/CAM dominates

From a dental technology perspective, CAD/CAM continues as a major focus. Systems of course can come and go very quickly - here one IDS gone the next - as dental variants of systems developed in other industries often fail to achieve critical mass in the sometimes fickle dental sector; whilst for others that have become "household names", IDS is the ideal stage to showcase their continued evolution to ensure future success.

Nobel Biocare's NobelProcera, Sirona's CEREC and inLab, Dentply Cercon, KaVo with Everest and soon the new Arctica, 3M ESPE's Lava, Straumann CARES, Zirkon Zahn, Amann Girrbach, Zfx and more were all displaying new additions and updates to their range of systems that have grown to dominate dental CAD/CAM.

The titans of industrialised manufacturing equipment like DMG, EOS and others, also displayed their full range of solutions, typically aimed at milling centres looking for high volume manufacture. Systems to mill from titanium, zirconia, lithium disilicate, wax, plastic, resin and more abounded - some truly innovative; others variations on existing themes.

Some milling centres from Europe even transported their production machines to the show to continue business as usual from the exhibition floor to give new and existing customers some real world insight.

Intraoral scanning

As a subset of the ever-expanding CAD/ CAM umbrella, digital impressions captured by intraoral scanners continue to generate great interest despite limited commercialization of these systems. The idea here is that rather than taking a traditional impression and either scanning the impression or scanning the model poured up from the impression ready for digital design, a scanner is instead inserted into the patient's mouth to create a digital 3D model - faster and more accurately than traditional methods. This impression can then be used as the entrée to the CAD/CAM process.

Sirona celebrated its 25th anniversary of "inventing" intraoral scanning last year as part of the CEREC CAD/CAM system and at IDS, they entered the broader digital impression-taking market with a scan-only version of the system designed to capture greater market share.

Whilst CEREC "proper" offers a complete CAD/CAM system that starts with the digital impression and concludes with a restoration milled "chairside", the new CEREC AC

Connect, announced in the March/April edition of *eLABORATE* and on display for the first time at IDS, is designed as a standalone intraoral scanner. Now priced at A$29,995, CEREC AC Connect allows dentists to take digital impressions and transmit them to the lab of their choice. Labs can download the CAD design software for free, then mill it on their own inLAB system or send it to the infiniDent milling centre in Sydney (aka Stoneglass Industries). Sirona has also upgraded its MC XL milling unit to mill models from the digital impressions, thus completing the final requirements for a lab in the digital dentistry model (see story on page 28).

Apart from CEREC that has been around in excess of 25 years and is now in its 5th generation, new systems incorporating intraoral scanning have only trickled onto the market in the last few years. Prior to IDS, they could be counted on the fingers of one hand; and whilst IDS 2011 was expected to see an avalanche of this technology released, post-show not all the fingers of the second hand are yet required to summarise this segment of the market.

Apart from CEREC, Cadent's iTero system, recently acquired by Invisalign and distributed in Australia by core3dcentres and elsewhere in partnership with Straumann, was next to appear and has been operating successfully for several years; D4D's E4D dentist and laboratory systems distributed by Henry Schein have been around in the US, Australia, New Zealand and South Africa for some 4 years and are gradually being released in other markets worldwide. 3M ESPE's Lava COS (Chairside Oral Scanner), first shown at IDS 2009, is yet to be released in Australia.

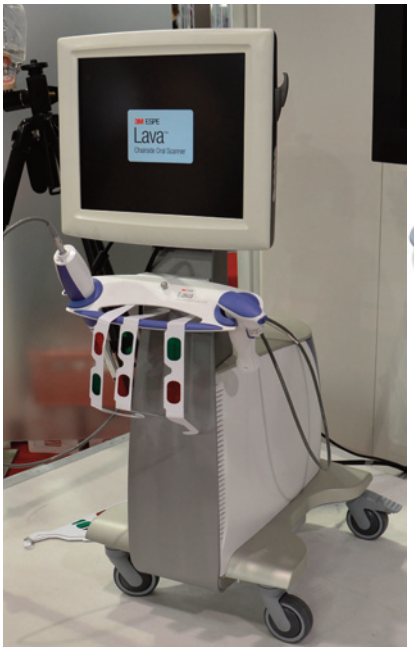
As far as new systems go, the highest profile entry to the intraoral scanning sector at IDS 2011 was 3Shape's Trios system that has been developed with cooperative funding from several high profile manufacturers who will each sell the system under their own brand. First cab off the rank will be Heraeus who will commence selling the "cara Trios" in the third quarter of 2011. Planmeca also shares in this technology and showed the system under the "PlanScan" brand. 3Shape itself will also add the Trios to its stable of scanners for direct sale at some point in the future.

MyRay, the imaging arm of powerhouse Italian dental manufacturer, Cefla, which owns brands including Anthos, Castellini, Stern Weber, Victor, Mocom, NewTom and Elca, launched their iD3 intraoral scanner at IDS. Similar looking scanners to this suggesting a common parent manufacturer included the Cyrtina Intra-Oral Scanner; the IntraScan from German CAD/CAM system ZfX, which has a milling centre in Lane Cove, Sydney; the IODIS intraoral scanner available from both intellidenta and Clon3d; and also a version from Biodenta.

The finally entrant to the intraoral scanning market (that we could find) was a.tron3d which again connects to the USB port of your computer.

Launch dates for several of these systems were non-specific and some were clearly still in varying stages of development.

Overall, the concept of a dental laboratory receiving an intraoral scan from a dentist rather than an impression or stone model is still in its infancy. Moving forward however, based on new products launched at IDS and the level of interest in this paradigm that promises much, this is likely to change as the use of this technology gains momentum.



3M ESPE's Lava COS chairside oral scanner and Cadent's iTero, distributed by Straumann in Europe were again shown at IDS while the Cyrtina Intra-Oral Scanner appeared as a new player with a design very similar to the iD3 and others.

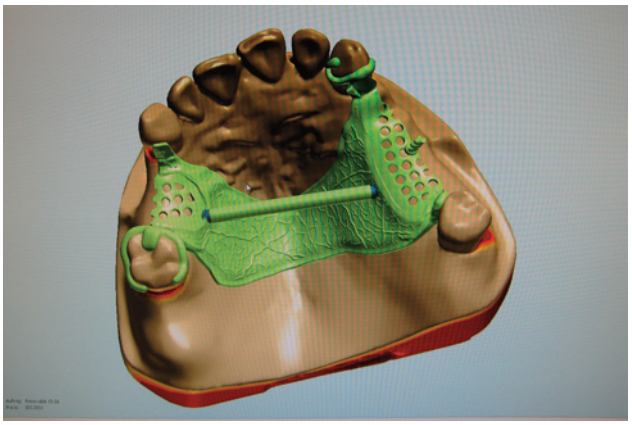
Model making

The one aspect of the CAD/CAM cycle that is still struggling to keep pace, however, is the production of models from these digital scans. Whilst CEREC and E4D have skirted this issue by removing the technician from the manufacture of restorations (so no model is required), any intraoral scanning system that incorporates the dental laboratory into the manufacturing chain - including the new CEREC AC Connect - requires that a model be made at some point for use on the bench.

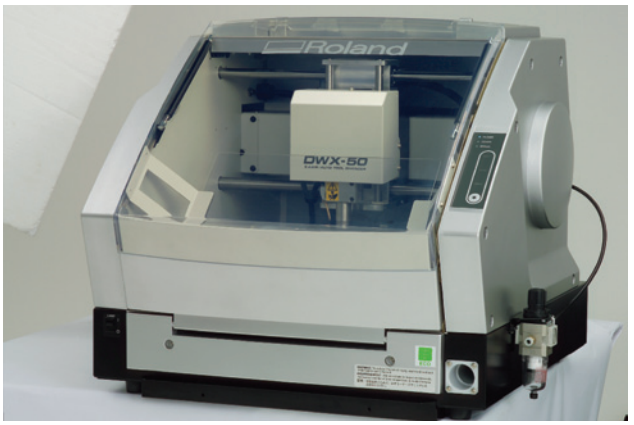
Whilst many systems exist to reconstitute working models from digital scans utilizing milling, stereolithography, 3D printing and other technologies, ensuring a high level of precision at a commercially viable price point has been the challenge. Technicians know the cost of pouring up a stone model and hence a digitally recreated model must ultimately be in this ballpark to compete.

3D Printing

The production of working models from 3D images is one application of 3D printing technology which has largely come from the rapid prototyping industries where objects designed on computer are reconstituted in a physical form as a pre-



Partial denture software from 3Shape. The virtual framework is printed in wax before being cast in cobalt chrome.



A Roland benchtop 5-axis mill with tool changing coming to Australia for under A$30,000 (plus software and scanner).

cursor to full scale production. In simplistic terms from a dental perspective, a model created from a digital intraoral scan can be "printed" as a 3-dimensional object and used in lieu of a stone model on the bench.

A further application of this technology is to print objects out of resin for casting, such as copings or frameworks for partial dentures or bridges. The SensAble system used by in Australia by Pearl and Proslab is one example of this.

Companies like 3D Systems, Envisiontec and Objet are all vying for market share in the sector and the winner on accessible products has to be Objet as they are making the desktop 3D printer more affordable and more accurate. Two years ago 3D printing would have been out of reach of most labs but is now becoming a viable part of the manufacturing cycle for many as costs have come down considerably. Milling centres are also increasingly adding this type of service to expand their ranges.

Laser sintering

Selective laser melting - sometimes called laser sintering - is an "additive" manufacturing technology also showing great promise in dental. The process uses a high powered lasers to fuse fine metal powder together layer by layer direct from CAD data to create functional metal parts. After each layer, a powder recoater system deposits a fresh layer of powder in thicknesses ranging from 20 to 100 microns. These systems use commercially available gas atomised metallic powders to produce fully dense metal parts in materials including Titanium, Stainless Steel, Cobalt Chrome and Tool Steel.

In dentistry, SLM technology will, for example, create metal copings as a replacement for cast copings for use in PFM crowns, bridges, etc. Core3dcentres and new player, Formero Pty Ltd, are already offering this technology to laboratories in the Australian market.

The "open" concept

The first CAD/CAM systems available in dentistry were out of necessity, a "closed" environment. A single supplier provided you with a scanner (whether intraoral or model) as a means to digitize the oral environment, design software to design your restorations and then a means to manufacture what you'd designed. This was a bit like buying an Apple Macintosh - Apple supplied the hardware and the software and it was pretty much guaranteed to work. The "open" "PC" concept, on the other hand, combined lots of hardware (the computer, processor, video cards, hard drives, etc) from a disparate group of suppliers and then left it up to the operating system (typically DOS or Windows) to try and get all of that to work in harmony, often with dubious reliability. A closed Mac system was more expensive but more productive; "open" PCs were cheaper to buy upfront but without considerable hardcore knowledge, often required an "IT guy" or whole department on speed dial to maintain constant productivity.

Dental CAD/CAM started closed because the original systems - namely Procera and soon after CEREC - created it from scratch. And apart from having to develop a workable concept from scratch, there was also zero market demand for dental CAD/CAM and so that needed to be created too (good job guys!).

Three decades and 200 systems later, CAD/CAM is the norm in most contemporary laboratories and "open" is the buzz word on everyone's lips!

At IDS, you can easily assemble your own CAD/CAM system with a multitude of vendors offering a range of scanners to create a digital model, software for design around that digital model, software for manufacturing the restorations created and hardware to subsequently create what you have designed in a slew of materials - and all of those components could be from different suppliers!

Complete systems

In the world of dental CAD/CAM, there are closed systems and there are open systems and there is a range of hardware, software and materials suppliers who will provide you with anything you believe you need which is all, technically, "open". Overwhelmingly, however, the vendors selling "systems" are looking to supply their customers with "complete" systems, regardless of whether that involves using open or closed componentry. And while trying to be "open" has been a novel distraction, laboratories serious about profiting from investments in CAD/CAM are quickly realising that whether open, closed or "selectively open" (as most systems have started to become), these systems must be robust, reliable, versatile and adaptable to changing conditions in the market.

Every option for CAD/CAM dentistry in 2011 was ripe for the picking at IDS this year. And whether old, new, borrowed or blue, the systems that cater to the complete needs of their clients - from scanning, design and production in a variety of materials and a variety of products - are the ones likely to be here again in 2013 when the greatest show comes around again.

For more info, see www.ids-cologne.de