PLANMECA CUSTOMER MAGAZINE 2011

plan world

Digital perfection

Unique 3D combination for open CAD/CAM

planworld

Planmeca customer magazine

Please contact us by email at
editor@planmeca.com

Editor-in-Chief
Heidi Pekkala, tel. +358 20 7795 580
heidi.pekkala@planmeca.com

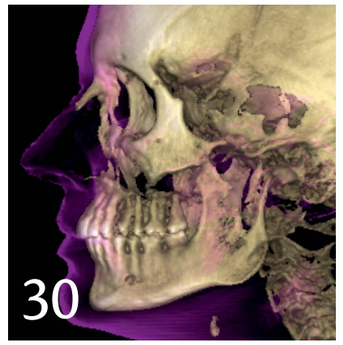
Editors
Tiina Lehtinen
Leena Aaltonen

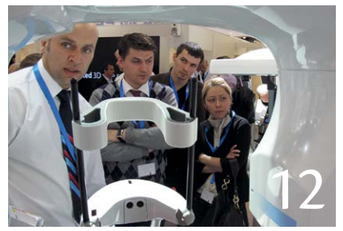
Lay-out
Perttu Sironen

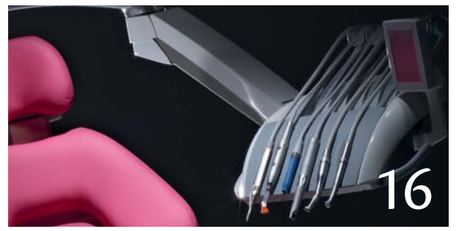
Publisher
Planmeca Oy
Asentajankatu 6
00880 Helsinki, Finland
tel. +358 20 7795 500
editor@planmeca.com
www.planmeca.com

Imprint
Libris Oy, Helsinki, Finland

Cover image
IDS 2011, Planmeca Oy's stand







CONTENTS

Digital perfection

New digital era of dentistry is here

HEIKKI KYÖSTILÄ
PRESIDENT

The biggest international event in our field, the biannual International Dental Show (IDS) is a significant showcase for all manufacturers. Since 1971, we have presented our innovations at the IDS following our mission of leading the way in the dental technology.

Planmeca's innovativeness was proved again at IDS 2011 in Cologne, Germany this spring. We introduced novelties in all product categories: dental units, dental imaging, and sophisticated diagnostic software. Our strong emphasis on product development was noted widely. Honouring our 40th anniversary, we launched a unique Digital perfection concept. Thus, Planmeca set new standards with world's first dental unit integrated intraoral scanner for open connectivity to various CAD/CAM systems.

We believe the best way to design cutting-edge products that really meet the needs of our customers is to listen to our customers closely. Observing and learning from their workflow helps us also understand the significance of the smallest details that can make a world of difference for the user. Our business is making the work of the dental team safer, easier, and more ergonomic. The whole workflow from tailored dental units that are seamlessly connected to various imaging units all the way to the satisfied customer – patient and dentist – is our passion.

In this new PlanWorld magazine we would like to bring you highlights of our product innovations. Also, the history of our product development as well as our mission and philosophy are introduced to you, our valued customers.

Explore the dentistry in new dimensions with Planmeca!

P.S. Planmeca will soon open new production facilities in Helsinki, Finland. With new production premises we can more effectively respond to the increased demand.

PLANMECA NEWS

Digital perfection – revolutionary integration of three 3-dimensional data

The innovative combination of intraoral surface data, 3D X-ray data and facial soft tissue image delivers clear benefits for different specialists. Integrating surgical planning and prosthetic planning, the 3D digital model helps defining the ideal position of implant. Furthermore, the implant planning data can be used in crown design.

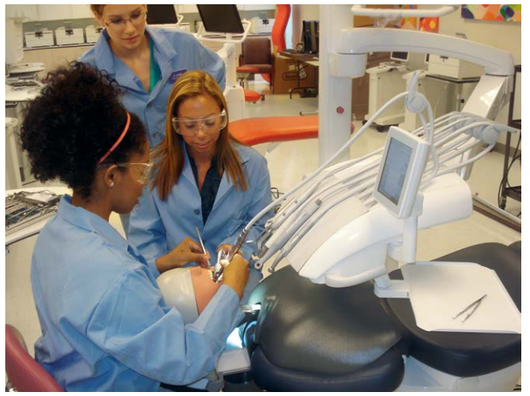
The 3D X-ray data alone contains accurate information about the bone structure. Now with the combined data, periodontal tissues can be evaluated in relation to bone. For Orthodontic treatment no gypsum models are no longer necessary, and the treatment follow up can be done using radiation free Planmeca ProFace images.

"The perfect combination of digital intraoral scan, CBVT and 3D facial photo exhibits our firm commitment to open CAD/CAM technology and best practices in dentistry. Planmeca strives for improving the end-user productivity by making the work flow at the specialist clinic as efficient and streamlined as possible," explains **Mr Tuomas Lokki,** Vice President of Marketing and Sales at Planmeca Oy.

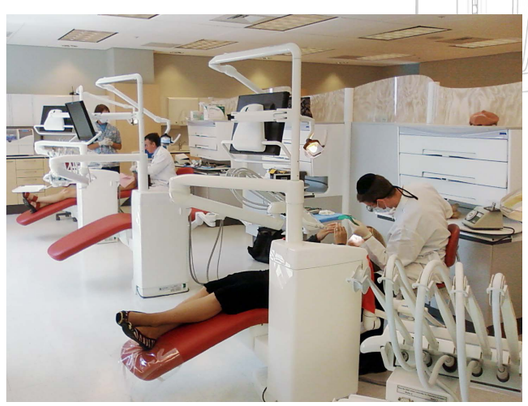
Read about the IDS highlighs on page 12.

COPY **GARY HACK** IMAGES **GARY HACK**

NEW TEACHING CONCEPTS IN DENTAL UNIVERSITIES



Room D (Dream Room): a Senior Dental Student training two pre-clinical students on the proper use of the Planmeca Sovereign chair in preparation for their upcoming experience in Cecil County.



Room D (Dream Room) with clinical students performing CAD/CAM restorations on patients.

The world's first school of dentistry, the University of Maryland Dental School, was founded in Baltimore, Maryland, on March 6, 1840. Today, the Dental School remains a pioneer and is leading dentistry into the future.

"Our students represent a link, a conduit to the future, due to the school's innovations in teaching digital dentistry," explains **Gary D. Hack,** DDS, director of clinical simulation. Dr. Hack believes it is essential that dental students learn new treatment modalities to stay current, and that they continually keep abreast of the latest innovations and knowledge.

"I believe that the University of Maryland Dental School is one of the most high-tech, digitally-advanced dental schools in the world," says Dr. Hack. Many technological innovations have been implemented by **Dean Christians S. Stohler,** DMD, DrMedDent, since the new Dental School building was completed six years ago.

Dr. Stohler's vision is to teach students to use both existing techniques and cutting-edge technology. For example, all of the dental chairs and preclinical simulation units (over 500) are wired for monitoring from anywhere in the building. Instructors can monitor each student, each procedure and even each instrument that is being used. Every dental chair also sends e-mail warnings of impending malfunctions.

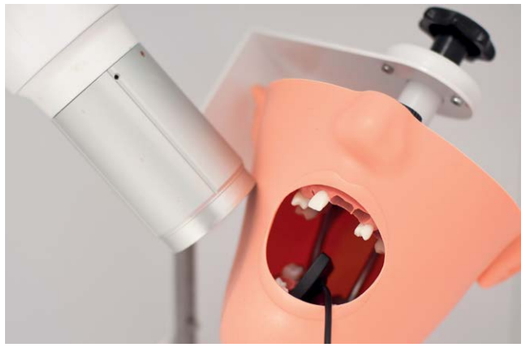
Room C (Clinical Simulation): year 1 dental students performing operative procedures on a simulated patient.

The Dental School is a widely-recognized leader in teaching computer-aided technologies for the design, analysis and production of dental restorations. The dental CAD/CAM system (computer-aided design and computer-aided manufacturing) designs, analyzes and mills tooth crowns. The entire procedure, from tooth preparation to delivery, can be accomplished in an hour.

This year, all 130 second-year dental students will have hands-on experience with chair-side CAD/CAM. They will acquire digital impressions, design their restorations on the computer and send this digital information to a milling machine.

The University of Maryland Dental School is the only dental school in the U.S. that exclusively uses digital radiography in its preclinical simulation programs. This allows students to seamlessly transition to working with live patients, since dental clinics also utilize digital radiography.

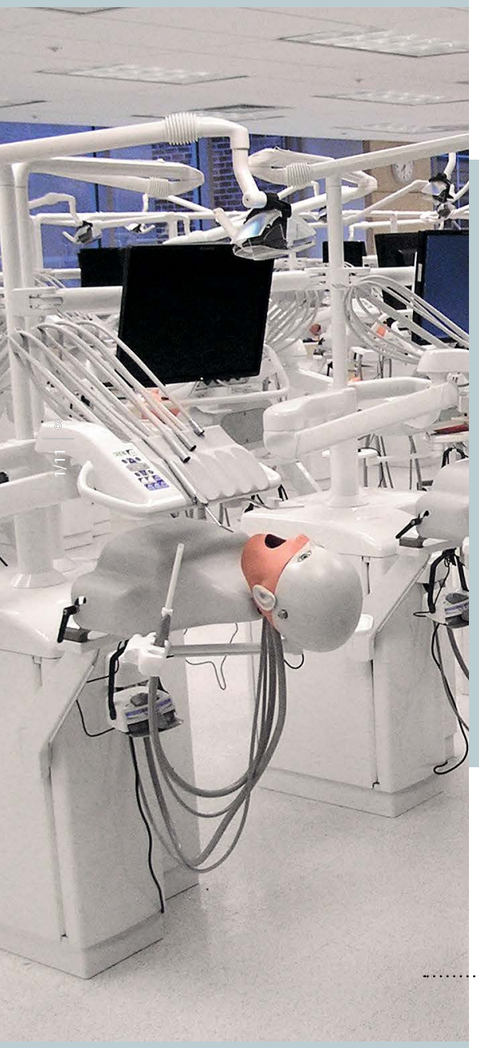
In September, 2006, the University of Maryland Dental School moved into its state-of-the-art building, which was designed with the most advanced dental technologies available. The facility features digital dental units, electric hand pieces, digital radiography, intra-oral cameras, rotary endodontics, implant simulation, virtual dental school environments, haptic technologies, CAD/CAM, virtual keyboards, virtual patients, electronic patient records and remote



Example of simulated "patient" being readied for a radiograph of a tooth having root canal therapy during the year 2 Endodontic Course.

Student working in room C (Clinical Simulation).

Room C (Clinical Simulation) ready for year 2 Fixed Prosthodontic Course.



learning capabilities. "The school has cooperated with the industry to push the envelope," says Dr. Hack. "Now we can provide high-technique technologies to better prepare our students for 21st-century dentistry, and to create a seamless transition for the students from the preclinical experience to the patient clinic."

World's first virtual dental school

Last year, the school also launched the world's first virtual dental school. Students log onto the virtual dental school to experience different aspects of dentistry, including lessons in dental hygiene best practices, infection control and skull anatomy. The software allows students to control a figure of themselves, called an avatar, by mouse and keyboard.

The school also opened a high-tech clinic in Perryville last year to help meet the dire need for better oral health care in that region. Dean Stohler envisioned the clinic as a way to ensure all local residents in rural areas would have access to the best care. The students, faculty and patients at the University of Maryland Dental School, Perryville, benefit from a fully-integrated system of electronic patient records. The records system is also a teaching tool and a functional model that is expected to be applied to the entire school in the near future. Moreover, the clinic utilizes 26 Planmeca Sovereign units, which are high-tech, digital dental units with incredible capabilities. "It is amazing to see the facility in Perryville today, and the dental students love their experience there", states Dr. Hack.

Simulation facility

The school's Simulation Facility is another example of high-tech teaching tools. The facility consists of four individual rooms.

The Ancillary Lab is a traditional plaster lab where students learn to work with plaster and stone models. The room was intentionally designed to be small, as students will eventually perform all the procedures digitally.

The Bench Simulation Room consists of 90 bench simulators and one teaching station with a ceiling-mounted microscope. This room is used for basic procedures that require a counter top, such as waxing or denture fabrication.

The Clinical Simulation Room is comprised of 80 advanced simulators and a teaching station. This room emulates the clinical environment and is used for advanced dental training, including Operative Dentistry and Endodontics courses.

The Dream Room consists of eight patient-ready digital dental units (one Planmeca Sovereign unit and seven Planmeca Compact units). This room is used to teach cutting-edge technologies, such as CAD/CAM and haptic devices.

> *The clinic utilizes 26 Planmeca Sovereign dental units*

CV

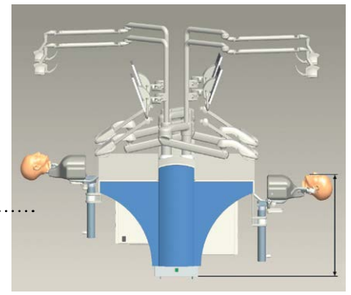
Dr. Gary D. Hack is the Director of Clinical Simulation at the University of Maryland Dental School, which is under the auspices of the Office of the Dean. Dr. Hack is also an associate professor in the Department of Endodontics, Prosthodontics and Operative Dentistry.

He has been a faculty member at the dental school for the past 25 years, and has been instrumental in helping to make the school a leader in cutting-edge technology.

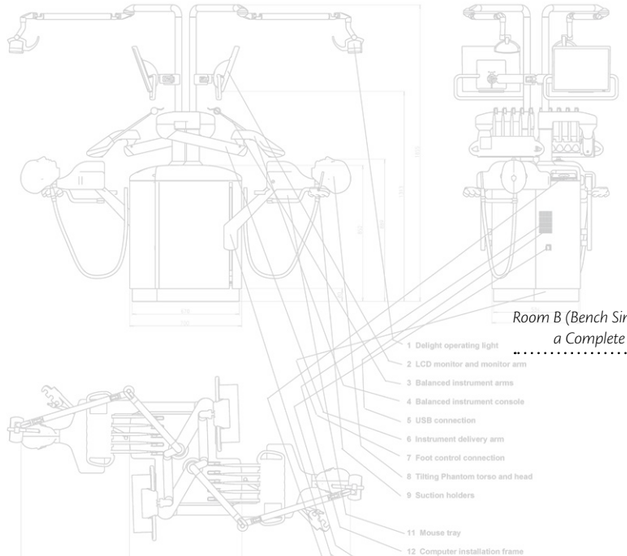
In addition to his activities with the schoolís Simulation Facility, Dr. Hack instructs dental students in several disciplines.

He is a prolific researcher and is a co-developer of NovaMin, which was recently purchased for $135 million by SmithKlineBeecham.

Room C (Clinical Simulation) before start of year1 Operative Course.



Mock-up of Simulation Room B during planning stage.



Room B (Bench Simulation) during a Complete Denture Course.

COPY TIINA LEHTINEN IMAGE HANNA MÄKINEN AND JAN FRÖJDMAN

IDS 2011 – New horizons ahead

Planmeca's stand, presenting the new visual identity with bright, playful colours, was very noticeable and stood out in the IDS. A wide variety of products and novelties were presented at the stand, and therefore, lots of visitors came by to get acquainted with the new product releases.

Planmeca had a 442-square-meter stand in hall 11.1.

Hot new products in all product categories

Planmeca introduced an unparalleled variety of new products in the IDS – one or more in every product category. The Planmeca Compact i dental unit is equipped with a new, easy-to-use touch panel that offers great usability and enhances workflow.

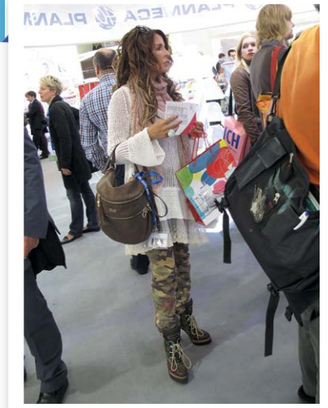
The Planmeca Romexis dental software got a new mobile application: Planmeca iRomexis, the first native Apple iPhone and iPad dental application that has integrated 2D and 3D image viewer with true hardware accelerated 3D surface rendering.

Also, the Planmeca ProMax 3D product family got two new additions: Planmeca ProMax 3D Mid and Planmeca ProMax 3D ProFace.

The new Planmeca PlanScan intraoral scanner makes the old-fashioned way of impression taking obsolete. An accurate 3D surface data is acquired through fast, spray-free process. Also, this ready-for-design data can be combined with other 3D data, such as a 3D photo acquired from Planmeca ProMax 3D ProFace system and the CBVT data from Planmeca's 3D imaging units.

The combined data makes preoperative planning and treatment easier, faster and more accurate – bringing enhanced results for a variety of specialists. This revolutionary concept is Digital perfection.

Biggest IDS ever in 2011: 115,000 visitors from 148 countries and 1,956 exhibitors from 58 countries.



Planmeca PlanScan is an intraoral 3D scanner that is based on open CAD/CAM technology.

Digital perfection for efficient workflow

In honour of Planmeca's 40th anniversary, a new Digital perfection integration concept was launched at the IDS 2011. Planmeca's modern, comprehensive, fully integrated 3D imaging system is designed for specialists in the dentistry and facial field to support the diagnosis and treatment of patients. Planmeca combines the 3D data from an intraoral scanner with a CBVT image from a Planmeca ProMax X-ray unit, and a 3D facial photo acquired from Planmeca ProMax 3D ProFace. This unique 3D combination provides clinical experts with a superior starting point for planning and implementing procedures.

The visitors could have their 3D face photo taken by the Planmeca ProMax 3D ProFace device.

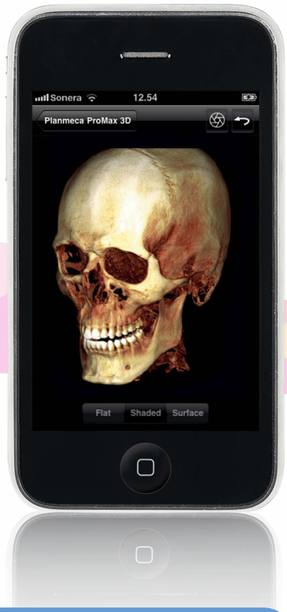
The IDS is a long-standing tradition for Planmeca Oy.
We presented dental products already in the 1971 IDS. See page 22.

New product releases

This year Planmeca brought to IDS five new products – one in each product category

The underlying theme is digital perfection in the whole workflow. The new intraoral scanner completes the digital process: combining the surface data from Planmeca PlanScan intraoral scanner with Planmeca Promax 3D CBVT X-ray data and the 3D facial photo acquired from Planmeca Promax 3D ProFace gives the specialists unforeseen advantage in operation preplanning. Knowing the patient's anatomy to the greatest detail makes surgeries faster and safer.

Share images to mobile devices and clinical partners using Planmeca iRomexis



Planmeca iRomexis is a mobile image viewing application for Apple iPhone and iPad devices. This advanced 2D and 3D image viewing application is designed to let users of Planmeca X-ray units utilise their investment to unprecedented extent. The Planmeca iRomexis application allows accessing images from anywhere in the world using Wi-Fi or 3G networks.

Planmeca is first to introduce a free native Apple iPhone and iPad application with integrated 2D and 3D image viewer with true 3D surface model rendering and capability to access images over 3G networks. All images acquired with Planmeca X-ray units, including Planmeca Promax 3D volumes and ProFace 3D photo face scans, can be viewed, enhanced and studied. Also, operating status of clinic's Planmeca Sovereign and Planmeca Compact i dental units can be monitored in real-time.

"Planmeca provides the most advanced tools – 3D imaging units and software – for acquisition and sharing of images and information for the benefit of patients."

"This concept opens future possibilities in communication and sharing of medical information between Planmeca's customer clinics, while taking into consideration HIPAA and other patient safety requirements," explains **Ms Helianna Puhlin-Nurminen,** Vice President of Digital Imaging and Applications Division at Planmeca Oy.

Planmeca Online service to complement mobile services

Images from Planmeca Romexis software can easily be sent through Planmeca Online account to Planmeca iRomexis device users anywhere in the world. The account-holder will be automatically notified on their Apple device when new images are available for viewing. The images can then be downloaded to the mobile device.

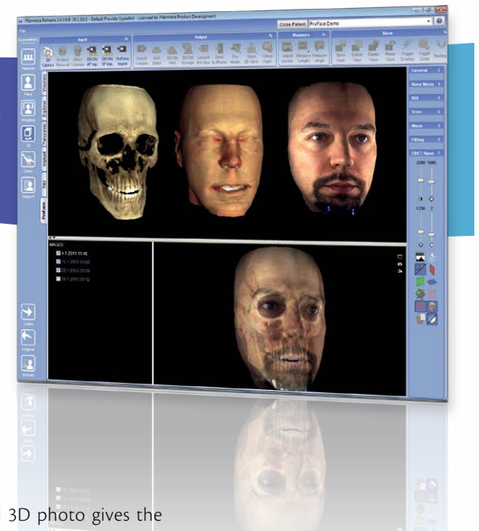
The new Planmeca Online is a free secure service that allows image-sharing between clinics that use Planmeca Romexis. E.g. a radiology centre can automatically deliver images straight to its customer clinic.

The free Planmeca Online account ensures secure delivery of images into the user's device when using the Planmeca iRomexis over a public internet connection. Please visit http://online.planmeca.com for more info.

Planmeca iRomexis is based on the acknowledged Planmeca Romexis desktop software suite. It supports both MS Windows and Apple MacOS and includes processing of all dental imaging modalities: intraoral, panoramic, cephalometric, 3D imaging, 3D photo, 3D intraoral scans, as well as photos and intraoral video imaging. Planmeca iRomexis is now available for use with all new and existing installations.

Planmeca iRomexis and Planmeca Online service are compatible with Planmeca Romexis version 2.6.R or newer.

Safer and faster facial surgeries with Planmeca ProMax 3D ProFace



Planmeca ProMax 3D ProFace system is an integrated 3D face scan system that can be added to any Planmeca CBVT imaging unit. This true 3D application is designed to fulfil the most diverse diagnostic needs of today's maxillofacial and dental professionals.

Planmeca ProMax 3D ProFace unit is an integrated 3D unit producing a realistic 3D face photo in addition to traditional digital maxillofacial radiography. One single scan generates both a 3D photo and a CBVT volume. Alternatively, the 3D photo can be acquired separately in a completely radiation-free process: the lasers scan the facial geometry and the digital cameras capture the colour texture of the face.

The patient's facial 3D photo gives the medical or dental professional opportunity to plan operations and document the follow-up images. The 3D photo visualises soft tissue in relation to dentin and facial bones, providing an effective follow-up tool for maxillofacial operations. Careful preoperative planning, where the medical professional can study the facial anatomy thoroughly using Planmeca Romexis software, facilitates a detailed operation and enhances the aesthetic results.

"This new product clearly demonstrates Planmeca's groundbreaking R&D in imaging. We provide the most advanced tools for visualising patient anatomy making treatment planning and follow-up for orthodontic, maxillofacial and aesthetic surgeries more precise, faster and safer," explains **Ms Helianna Puhlin-Nurminen**, Vice President of Digital Imaging and Applications Division at Planmeca Oy.

Planmeca ProMax 3D Mid: an optimal volume size for every 3D imaging application

Both Planmeca ProMax 3D Mid and Planmeca ProMax 3D ProFace are based on the acknowledged Planmeca ProMax platform which makes future upgrades extremely simple.

The existing products in Planmeca's 3D concept are Planmeca ProMax 3D s, ideal for applications where a smaller field of view is sufficient, Planmeca ProMax 3D for general 3D applications with a field size covering the mandible and maxilla, and Planmeca ProMax 3D Max including variety of field sizes from single tooth to whole maxillofacial area.

The Planmeca ProMax 3D ProFace feature is available for:
Planmeca ProMax3 s, Planmeca ProMax 3D, Planmeca ProMax 3D Mid and soon also for Planmeca ProMax 3D Max.

The new Planmeca ProMax 3D Mid provides an extended selection of 3D volume sizes combined with traditional 2D panoramic and cephalometric imaging.

The product offers an optimal volume size for every specialist application requiring 3D imaging. The volume sizes range from 34 x 42 mm to 16 x 16 cm. This wide selection of volume sizes allows optimising the imaging area according to specific diagnostic task – always complying with the best practices of dentistry and the ALARA (as low as reasonably achievable) principle to minimise radiation.

The Planmeca ProMax 3D Mid also offers new kind of panoramic imaging. The standard panoramic imaging program is optimised to expose only the teeth area reducing patient dose. Optionally, the temporomandibular joints can be imaged with a program in which the TMJ imaging angles can be adjusted like in regular TMJ programs. "The Planmeca ProMax 3D Mid demonstrates our best practices in imaging. It provides the most advanced visualisation of patient anatomies for a variety of diagnostics needs – never compromising the important principle of minimising the radiation dose when feasible," explains **Mr Auvo Asikainen,** Vice President of X-ray Division at Planmeca Oy.

Planmeca Compact i Touch dental unit

Fully integrated touch panel for excellent usability and workflow

The new generation Planmeca Compact i dental unit has an integrated 4.3 inch touch panel. The dynamic user interface adapts to the selected instrument and displays all relevant functionalities at a touch of the fingertip. The touch panel technology provides the opportunity to fully enjoy the benefits of a digital dental unit in the daily clinical work.

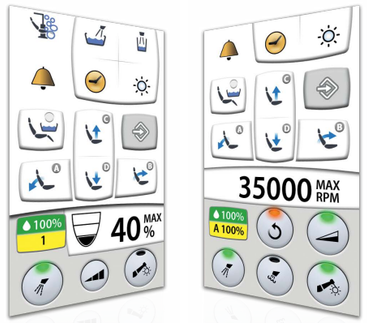
The intuitive use of dental unit and enhanced infection control are the main design outcomes of the new streamlined user interface. The clear symbols and text in the large touch panel makes using the dental unit simple.

Key advantages of the new touch panel interface are the improved features for instrument use. The real-time user interface guides the user with clear symbols and text during instrument use. All necessary adjustments are made effortlessly on one screen.

The Planmeca Compact i Touch provides optimal support for individual user preferences and intelligent presets in clinical patient treatment.

Infection control is further improved with clearer infection control features: the user is guided by simple notifications to perform the dental unit cleaning cycles. Moreover, the touch panel is integrated in the new and durable aluminum cast console, which provides the best possible lifespan and resistance. The powder-painted epoxy surface is easy to keep clean and tolerates disinfection liquids. The new, smooth lined design also has open handles offering the possibility to use sleeves if preferred.

"Planmeca continues to be committed to user-oriented, functional product development and design combined with the latest technology."

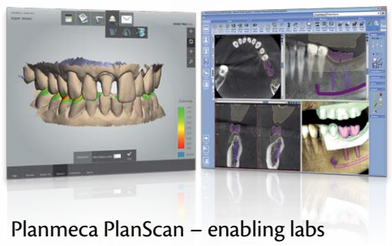


"Our mission is to help the dentists work in a modern dental office where ergonomics, hygiene and functionality are paramount," explains **Mr Tuomas Lokki,** Vice President of Sales and Marketing at Planmeca Oy.

Full digital intraoral scanning solution

World's first dental unit integrated intraoral scanner Planmeca PlanScan

Planmeca PlanScan intraoral scanner is designed to bring measurable benefits for patients, dentists and laboratories: The innovative combination of intraoral surface data, 3D X-ray data and facial soft tissue image delivers clear benefits for different specialists.



Making the treatment process faster and more accurate

Planmeca PlanScan intraoral scanner allows the dentists to capture the complete intraoral situation and save it as a highly accurate 3D digital model. This model is instantly ready to use for design.

Patient satisfaction soars – due to less chair time, reduced retakes, faster treatment completion, better fits and an overall improved chair-side experience.

Planmeca PlanScan intraoral scanner is fully integrated to dental unit, which enhances ergonomics and all-digital workflow.

Planmeca PlanScan is also available as Cart delivery when preferred.

Planmeca PlanScan – enabling labs to tighten relationships with dentists

Labs can strengthen their professional ties with their dentist clients by offering new digital services that include receiving the dentist's Planmeca PlanScan scanner data directly. They will be effectively helping dentists' transition into digital impression taking while enabling them to enjoy the full range of indications and high quality results that come with professional dental technician expertise. The lab will also experience workflow benefits – more accurate case input and shorter turnaround times because restoration design work can start immediately without creation of a physical model.

Planmeca ProMax 3D

Unique product family

Perfect sizes for all needs

3D X-ray • 3D photo • panoramic • cephalometric

Perfect combination with Romexis software

Digital perfection

More information **www.planmeca.com**

PLANMECA 40 1971 - 2011

COPY LEENA AALTONEN IMAGE PLANMECA OY

What lies behind the design award success?

Planmeca has received several design awards over the recent years for its dental and X-ray units for their excellent ergonomics and clean, approachable, inviting design. But what is the secret behind the design award success?

Planmeca's industrial design manager Mr **Kari Malmén** considers the design awards as the result and a recognition for long-term committed work and successful cooperation for the whole Planmeca crew. "The design concept requires a lot of time to stew and develop. The cycle of products is quite infrequent and launching of a new product will take several years. There is no shortcut to happiness but a lot of determined work is required", Malmén says.

Exceptional among its peers, Planmeca has since the beginning hired its own designers as permanent employees. Thus, the company undoubtedly has deeper knowledge in the design than those using consultants. According to Malmén the designers are an integral part of the product development.

The comprehensive design perspective is extremely important. An outsider designer would not be capable of considering and absorbing all the different issues which have to be solved during the design process.

"Teaching a person our ways – what the most essential things to us are and what we want the end result to look like – would also require intensive training," he describes emphasising the importance of using in-house designers.

Another advantage of in-house designers is that they are responsible of the final execution of the product. This way they can make necessary changes even at a relatively late stage in case something goes wrong. This allows the designers to make improvements and polish the product until the last moment.

"With outside designers the final responsibility of the product is more or less left to the customer. The outside consultants might not even be in the country any longer when the product is launched. We have a different way of seeing the projects through," says Mr **Tero Pihlajamäki,** user interface designer.

Mr **Jouko Nykänen,** Director of Export Sales, considers the awards as important milestones and acknowledgements for Planmeca. For sales and marketing team, the awards give added confidence and pride for the products.

The awards also support strongly the company's principle that every aspect or feature of the product should carry a true benefit for the users, making their life and work safer, easier and more efficient.

"In a way, the design awards are also sort of quality certificates, confirming that the comprehensive set of features and technology, as well as the vision behind the product, has something profoundly unique and beneficial," he summarises.

fenniaprize 09
good design grows global
HONORARY MENTION

The design awards Planmeca has received over the recent years:

Red dot design award 2009, Germany
Planmeca ProOne, Planmeca Sovereign

Fennia Prize 2009, Honorary mention, Finland
Planmeca ProOne, Planmeca Sovereign

if product design award 2008, Germany
Planmeca ProOne

if design award china 2007, Top Selection, China
Planmeca Sovereign

if design award china 2007, Honourable Mention, China
Planmeca ProOne

COPY TIINA LEHTINEN IMAGES PLANMECA OY

World Design Capital Helsinki 2012

Interior of the Temple Square Church in the center of the Helsinki City, Finland

"Helsinki orientates strongly to the future as the design capital and aims at making design an integral factor in developing the citizens' living conditions, in international interaction and economic progress."

The International Council of Societies of Industrial Design (ICSID) designated Helsinki as the World Design Capital for the year 2012. A total of 46 cities from 27 countries applied for the 2012 nomination. The first World Design Capital was Turin (Torino) of Italy in 2008. World Design Capital 2010 was the South Korean capital Seoul.

www.wdc2012helsinki.fi

Design is deep-rooted in the urban lifestyle of Helsinki. Design is manifest in the everyday lives of citizens in many ways, ranging from home furniture and items that represent old Finnish design traditions to modern urban solutions in the city and contemporary interior design.

Helsinki takes a broad perspective in design that – in city planning, architecture, industrial design and service design – plays an integral role in the development of Helsinki, city services and consumer products.

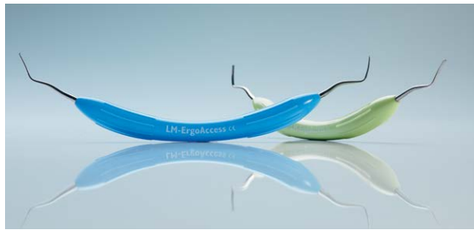
Open Helsinki – Embedded Design

The overriding theme of Helsinki's World Design Capital year and events is design embedded in people's lives. Helsinki approaches design from a broad perspective, and design underlies all processes that bring about social, economic and cultural improvement. Embedded design in Helsinki brings together human needs, aesthetic qualities and functionality.

Design embedded in everyday life in Helsinki ties design to innovation from the very beginning. Design brings the user perspective to processes where solutions to citizens' needs are sought. This approach ensures that the solutions are suited for everyday life and appropriate for users. Thus design helps to render new innovations, technologies and systems sustainable.

WORLD DESIGN CAPITAL HELSINKI 2012

Helsinki's World Design Capital year 2012 will comprise a wide range of events and projects related to design and its manifestations. In 2012 Helsinki will also celebrate the 200th anniversary of becoming the capital of Finland.

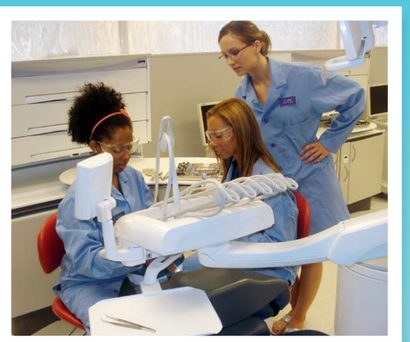


Interior of the Planmeca Head Office, Finland

CUSTOMISATION DELIVERS THE DENTAL UNIT OF YOUR DREAMS

Why settle for the standard? The users of dental units are all different. Also, customer size and comfortability, as well as clinical work flows and ergonomics are individually unique. This is exactly why the Planmeca Sovereign dental unit indulges its users with exceptional modularity – the freedom of extensively configuring the features and options of the unit to meet their individual preferences.

Some dental clinics work two-handed, some four-handed. Moreover, the user preferences for positioning of the instrumentation vary. Ergonomics, while essential to all, are crucial for extraordinary users – dentists and assistants – who are, for example, left-handed. The designers of Planmeca Sovereign dental unit studied a variety of users and work-flows – as a result, the unit can be fully customised.



When the patient comfort counts

Case: Dr Davis, Makassar Dental Care, Jakarta, Indonesia

One of the crucial points at the clinic of Dr. Davis is the patient comfort. The combination of a motorised backrest and a motorised headrest allows for optimal patient positioning effortlessly, without compromises. Therefore, the selection of motorised backrest and motorised headrest was very logical for the Makassar Dental Care clinic.

The chair is equipped with chair swivel to allow the patient feel appreciated and equal.

"This unique feature enables optimal patient entry and exit positions as well as a comfortable consultation position. Also the ease of workflow – moving from entry/exit to treatment and cleaning positions – was emphasised" explains **Mr Sami Puhlin,** Area Export Manager for Indonesia.

> *The Planmeca Sovereign configuration in the Makassar Dental Care clinic:*
> *side delivery and hanging tube instruments, motorised base swivel, motorised chair swivel, motorised backrest and headrest, motorised bowl, assistant element with 3 positions.*

Different work-flows – different configuration

Case: UMB Dental School Perryville (Cecil County), USA

"The chair configuration was carefully chosen to meet the needs of Perryville. The bowl was eliminated for reasons of infection control and ergonomics," explains **Dr Gary Hack,** the Director of Simulation in the UMB. "At Perryville, the assistant element is provided from behind the patient on the dental cabinet. Thus, it may be adjusted to be positioned for the assistant and dentist."

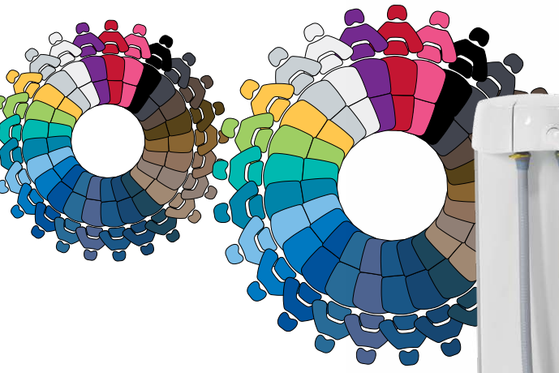
"In the US, four-handed dentistry is taught differently than in Europe. For example, in Europe the dentist and assistant face each other in a knees-to-knees position at the head of the chair", explains **Mr Bob Pienkowski** of Planmeca, Inc. "In the US, however, the dentist sits in a knees-to-hips position in relation to the assistant. This always places the assistant facing the rear cabinet. As the instrumentation is placed in front of the assistant, the access to the instrumentation is directly within the assistant's line of sight and reach."

> *The Planmeca Sovereign configuration in UMB Dental School Perryville:*
> *balanced arms, motorised base swivel, motorised chair swivel, motorised backrest and headrest, no bowl, no assistant element.*

COPY TIINA LEHTINEN AND PÄIVI HYYTIÄINEN IMAGES PLANMECA OY

"The all in one as an underlying company philosophy remains at focus. However, the symbol is not necessarily visible in all materials."

Päivi Hyytiäinen, AD,
Planmeca Oy,
Advertising Department



"The visual identity is not the only one getting new colour. The whole new selection of delicious upholstery colours is also available for our dental units."

Planmeca's new, refreshed visual identity

"More colour – more fun!"

The new era – new face. The new, refreshed Planmeca look greeted the IDS attendants.

The previous visual identity was created four years ago, and the main atmosphere has been cool, distant, clean, and light-coloured with identifiable Planmeca faces on all material.

"Every four years we tend to renew the overall visual identity. This time, we wanted to do something different: more distinguishable, more fun, more colourful."

Behind the new look is Ms Päivi Hyytiäinen who works at the advertising department of Planmeca HQ as an AD, Art Director.

"Also, we wanted to be more human – a bit easier to approach. However, the clear message of high technology and precision needed to be delivered at the same time," explains **Ms Päivi Hyytiäinen.**

The new look was first tested at the *Highlights in imaging* tour last spring. The process got the green light. "A lot of people from different functions of Planmeca gave their input and views refining the form and colour scenery further," Hyytiäinen says.

Message behind colours and form

The new look uses boldly playful colours, not forgetting the nature of the dental field. Without being highly "clinical and distant", the look continues to convey the idea of hygiene, safety, and technology. As the products are state-of-the-art, the new colours bring out the fine design and glimmering smooth surfaces.

Also, the form of the colourful surfaces and colours are at symphony.

"The flexible use of form and colour also reflects our innovativeness, adaptability, and modularity."

Solution-oriented thinking

The other part of the new visual identity is the whole new solution-oriented way to construct brochures – and the Planmeca website as well. The first spread of each brochure is a snapshot of what we can offer. The newly redesigned website also starts with the question "What do you want to do?"

"This way, the customer does not need to know the products before they can find the details. Instead, they can approach us through their needs."

"While the colours are used to differentiate us from the competition, they also are used to mark our product offering", Hyytiäinen explains. Thus, for example, our specialist flyers can be distinguished by colour. Also, the line of brochures can easily be extended for new products.

Strong support from the management

From the beginning, the bold new style was received well by the management. It was also welcomed by the IDS audience.

"Several IDS visitors came to me saying that the new look is refreshing, even beautiful – and we definitely stood out", states **Mr Heikki Kyöstilä.**

The www.planmeca.com website was redesigned this spring. By the end of the year, all the language versions of the Planmeca website will also be converted into the new look.

Highlights of Planmeca's product development history

40 years of better ergonomics, high technology and design

COPY SARI MYLLYRINNE IMAGES PLANMECA OY'S ARCHIVE

1971 - 2011 40

Planmeca Oy, a health care technology company established in 1971, is one of the success stories of Finnish business. Its input into product development and innovation is unrivalled. Today, it is quite rare for a Finnish company to have domestic private ownership and keep its industrial production in Finland. Over the past 40 years, the company has become the world's largest family business in its field.

This is the Planmeca story.

Planmeca Oy started as a small-scale business importing dental equipment and manufacturing instrument cabinets and dental stools.

Some lucky coincidences in the operating environment played a part in Planmeca's success story. During the company's early years, the universities of Oulu and Kuopio established their institutes of dentistry. In those days, it was common to favour domestic suppliers in an attempt to promote the growth of Finnish industry. For Planmeca, this worked well, providing a framework for R&D investment.

Planmeca's very first dental unit was launched in New York in 1979. The new business was also noted in Finland. The PM 2000 dental unit was the first step towards enabling configuration, as one of the first units to use cassette technology in instruments. Each instrument was built as a separate piece that could be easily installed in the instrument console in the desired order. Instruments could also be added later or removed for maintenance. The launch of the unit brought success in the highly competitive import market. The success of the first unit helped to win investment for product development and contributed to the purchase of the first industrial premises.

Microprocessor control enabled adjustability

Planmeca was one of the first to launch several new concepts. Planmeca's concepts differed from its competitors' products and others started to copy them. Planmeca's product development led to the world's first microprocessor controlled dental chair in 1983, together with a dental unit and panoramic X-ray unit in 1986.

The use of microprocessor technology and integrated control at an early stage was a sound strategic decision. Microprocessor control was the pivotal factor in the sale of 10,000 patient chairs to the United States in 1984.

The microprocessor control equipped the dental units with all the necessary functionality. For the first time dentists were able to program the exit and working positions, for example, in a smarter and more versatile way than with analog technology. Thanks to software control, these patient chairs had fewer mechanical parts and were more reliable and less expensive than older products. They were also smaller in size.

The mechanics of these chairs were designed from scratch, aiming for more advanced manufacturing techniques. One outcome was that the aluminum frame was designed as both a supporting and a visible surface. The chair was firm with a thin backrest making the treatment considerably more ergonomic. The chair, with its rotating armrests, was also more elegant than other contemporary chairs.

The PM 2002 CC dental unit was launched in 1986, and was ahead of its time in many ways. It was the first entirely microprocessor controlled dental unit and it also introduced features that competitors' units did not have, including an automated suction tube cleaning system. At the time, the PM 2002 CC was the most advanced dental unit using cassette technology, but it was not problem-free. Thus, the unit was replaced by the PM 2002 EC which was partly a stripped-down version of the original control system.

In 1995, Planmeca launched yet another innovation, a dental unit with an integrated patient chair. It was a solution to improving hygiene as it used a new instrument console principle: no seams between the instrument cassettes. The unit's functions were controlled by only four printed circuit boards, which enabled the creation of a small and simple, but intelligent device.

Panoramic X-ray unit with a new principle

One factor behind Planmeca's fruitful and pioneering product development has been the fact that it has not been hidebound by tradition. The small, young product development team deliberately set out to question the principles of older equipment and utilise modern technologies. This approach has become Planmeca's own tradition and the company is renowned as a developer of unconventional products.

The successful patient chair project in the 1980s was followed by a further triumph for Planmeca – the development of the panoramic X-ray unit. Planmeca's approach and microprocessor control challenged the mechanical model of traditional film-based narrow beam volumetric tomography.

Planmeca realised that the movement of a beam and film cassette should be separated with the aid of microprocessor control. The programming was independent of the mechanics, which led to new exposure programmes and significantly affected the appearance of the unit. With its aluminum frame, the unit was the smallest and lightest on the market. The new structure and exposure procedure made it easier to position the patient making the procedure also more pleasant. Unlike competitors' products, a patient could be positioned in Planmeca's unit even while sitting in a wheelchair. The structure soon became the norm in the field.

These elements created the world's most widely sold panoramic X-ray unit and the concept has been extensively copied. The success of this device confirmed the view that Planmeca product development had backed the right technologies.

The age of digital imaging and software

The time was ripe for digital imaging in the mid-1990s. Planmeca's product development team was prepared to introduce digital imaging to dentists even earlier, but it was not considered commercially profitable back then.

Digital imaging improved radiation hygiene. At the same time, darkrooms, film development chemicals and archiving become redundant. Planmeca saw digital imaging as something more than just the digital form of an image. The real benefits would not be achieved, however, until the digital reconstruction could be processed with a programme after capturing the image. Planmeca was one of the first companies to introduce digital imaging in a panoramic X-ray unit. The Planmeca Dimaxis imaging software was launched in 1997.

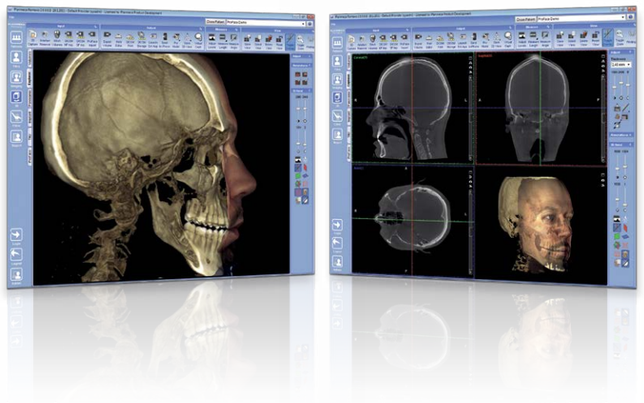
Planmeca's product range offered equipment for both the treatment of patients and imaging. The challenge for product development was to create software that would marry together all these aspects so that those working with patients by the patient chair had access to all the necessary information via one user interface. In 1999, this idea was turned into an all-in-one entity.

The new dimension of imaging

Planmeca continues to challenge traditional views and find new solutions – even with its own product development.

One pivotal moment was the launch of single biggest product development project, the Planmeca ProMax, in 2001. It remains the most versatile imaging unit in the market.

Based on the strong market-orientation towards digital imaging and the innovative minds of the product development team, the company developed a robot arm (SCARA) for the Planmeca ProMax. The robot arm



makes the device a flexible base that can also support new applications. A large number of unique exposure programmes were introduced, such as tomography and transtomography. In less than ten years, the unit has been heralded as the lead product of the new generation of units.

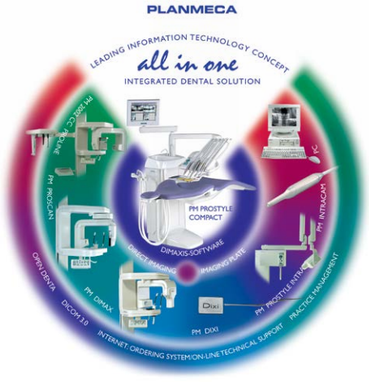
Responding to the needs of its customers, Planmeca added the 3D imaging to the functional base as a new imaging modality. With this solution, Planmeca became once again the first in the field to introduce a device combining panoramic and 3D imaging as well as cephalometry and tomography. The product has proved to be a commercially successful solution that competitors have copied.

Planmeca, reformer of the dentistry teaching environment

Planmeca's own product development is still constantly creating new product concepts and global solutions to support the work of dentistry professionals. As early as the end of the 1990s, Planmeca realised that it should combine all devices in the dental unit, controlled through one user interface, to create a more efficient and ergonomic working environment for dentists.

The All-in-One concept was initially created for small dental offices. However, the original idea underwent several developmental steps to reach the current state where Planmeca's concept is the most comprehensive solution and the only one that can equally well serve large university clinics, for example. Planmeca's most significant projects in the 21st century have been large orders for devices by the world's leading institutes of dentistry, worth up to tens of millions of euros.

Planmeca has developed a device and software solution for educational purposes, networking dental units and thus enabling central management and control of equipment. This also supports the work of the dentist in training in a treatment learning situation. Several universities around the world use Planmeca's equipment in teaching.



Awarded design

Since the company's early years, Planmeca's owner and managing director **Heikki Kyöstilä** has had strong views about the appearance and design of its products. The products had to be small and slender, yet robust and distinguishable from competitors' products. This design-orientation had far-reaching consequences. The design of Planmeca's products is respected in the field. Over the years Planmeca's products have also received several awards in international design competitions.

Planmeca's differentiated design is not a coincidence, but the result of deliberate development.

The foundations for the company's later success were laid at the turn of the 1980s by a group of young, open-minded specialists who believed in a new way of manufacturing dental units, and in the use of information technology. Planmeca's technological solutions and new manufacturing methods made slender structures possible. It also created a recognizable design. The small, sleek products became Planmeca's trademark.

In 1987 Planmeca employed its first designer – quite early considering the company's size at the time. The company keeps the design and planning in-house because devices planned at different times have to follow the same timeless Planmeca design.

While Planmeca's competitors have outsourced their operations, Planmeca aims to keep production in-house. The products are mainly manufactured in Herttoniemi, Helsinki, and Planmeca is currently the largest employer in eastern Helsinki.

The keys to success

Planmeca's R&D continuously draws on dental professionals' views as well as technological innovations. The foundation for its success has been the private ownership that have enabled long-term planning. This way, the company has been able to change plans on a tight schedule when needed.

Planmeca's R&D has developed in many aspects. Creating the first internationally successful panoramic X-ray unit showed determination and courage. The same innovation-oriented approach applies to Planmeca's subsidiary, Planmed, which produces mammography devices and, orthopedic imaging equipment.

Honouring Planmeca's 40th anniversary, the company launched a new Digital Perfection integration concept which supports the existing all-in-one model. Planmeca introduced a comprehensive and fully integrated 3D imaging system to specialists in the dentistry and facial field which supports the diagnosis and treatment of patients. Planmeca is the first company to combine 3D data from a 3D intraoral scanner with a CBVT image from a Planmeca ProMax X-ray units and a 3D facial photograph from Planmeca ProMax 3D ProFace system, providing clinical experts a superior starting point for planning and implementing procedures. Planmeca's commitment to open CAD/CAM technology also enables a new kind of business as a subcontractor for dentists and dental laboratories as well as a manufacturer of implants for facial surgery.

Planmeca has been among the first companies to introduce a range of devices to the field, often in a different way to most of its competitors. The combination of technology, ergonomics and design has enabled the company to go far.

The new addition to the Planmeca campus is designed by architect Juha Larkas.

Planmeca enlarges its premises

The project for the new addition of Planmeca production facilities reaches soon its goal. The new premises are located within a walking distance from the Planmeca headquarters in eastern Helsinki suburb of Herttoniemi, Finland. After completing the new 118,000 square feet annex building the company occupies total of 475,000 square feet.

This summer the new facility is opened:

- The ground floor will be occupied by our technologically advanced metal workshop as well as the powder painting department. In addition, the ground level has robot-operated warehouse space for these functions.
- Production of Planmeca's top-quality dental units will be situated in the second floor of the new building.
- The third floor will be dedicated to our subsidiary in medical imaging equipment, Planmed. Both Planmed offices and production will move into the new building. Thus, Planmed's high-quality mammography units as well as the 3D imaging device for extremities, Planmed Verity, will be produced there.

Planmeca's President **Heikki Kyöstilä** is satisfied with the project.

"Planning the building started only in April last year, and despite the extremely rough winter conditions, the construction stayed in schedule."

"With new production premises we can more effectively respond to the increased demand and at the same time improve the reliability of deliveries."

Planmeca's unique dental education concept takes over South East Asia

Planmeca has signed a delivery agreement with the International Islamic University Malaysia (IIUM). In co-operation with its local distributor Amedix sdn. Bhd Planmeca supplies the IIUM with 173 Planmeca Compact i and one Planmeca Sovereign dental units, three Planmeca ProMax 3D imaging systems, and 7 digital Planmeca Intra and Planmeca ProSensor intraoral imaging systems.

In the IIUM's case Planmeca's system e.g. notifies about unit maintenance routines and offers centralised suction system and amalgam separators. The software platform enables remote consultation between the students and the faculty.

Although treatment tradition in the area favours hanging tube instrument delivery IIUM chose Planmeca dental units with over-the-patient delivery contributing to ergonomics and hygienic work environment.

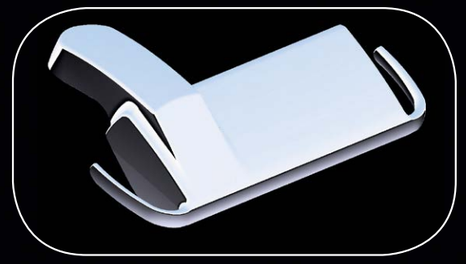
"In the Asian market, the competitive assets of Planmeca's dental equipment are superior design and simplicity of use, both promoting efficient workflow. We are happy that young professionals become predominant users of the latest technology and familiar with the Planmeca's product philosophy in the early stage of their profession. These university deliveries are a fundamental part of our business", says **Mr Tuomas Lokki.**

The agreement with IIUM is one of the first university deliveries in South East Asia. Planmeca's local distributor Amedix has years of experience of large delivery projects and is strongly present in the area supporting Malaysian dental professionals. The installations have already begun.

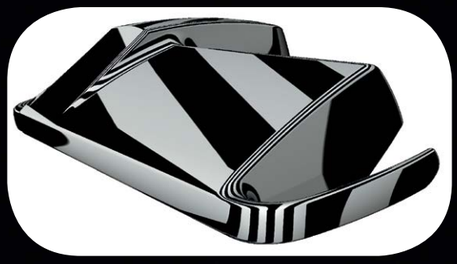
International Islamic University Malaysia website:
www.iium.edu.my

New Planmeca Compact i instrument console design

– art, science or both?



Surfaces flow seamlessly when elements meet



Reflections travel smoothly

The new instrument console is built of extremely durable powder-coated aluminium that has proved to withstand wear and all disinfectants best and for longest. To provide a better viewing angle, the GUI is tilted up from the console surface – but not too much to avoid it from blocking the view between dentist and assistant. The integrated, seamless and hygienic aluminium handles are now open from the back to enable easier grip from all directions.

COPY LEENA AALTONEN IMAGES TIMO SILVONEN

At early stages, when features, manufacturing technologies and the product concept are still being discussed, the most efficient way to study design options is sketching by hand.

Planmeca has created a new graphical user interface (GUI) platform for its renowed Planmeca Compact i unit, based on touch screen technology. With all-new GUI hardware, the Planmeca Compact i instrument console was redesigned. At the same time many improvement proposals of dental professionals could be fulfilled. The designers tell how the console was created.

New GUI platform

"The future of user interfaces lies in adaptability. Freeing ourselves from physical buttons lets us develop and expand the user interface endlessly," state Planmeca's industrial designers.

"We wanted to keep the working method of the new touch panel close to the previous one so that the introduction of the new console would be easy without requiring an extra learning period from existing users."

"With the new touch panel, in any given situation, only the required functions can be presented to the user. By monitoring the work flow of dentists and hygienists the layout of the icons could be organised according to their functions. The icons for active instruments, for example, will appear at the bottom of the control panel as close to the user as possible. While instruments lie at rest, their icons are not shown to prevent them from stealing attention from more important actions. However, if another function needs to be used while an instrument is activated, it can be brought back on screen with a simple swipe on the touch screen."

Another important improvement is the timer that, in addition to the memory slot, shows also its preset time. The instructive help and error messages introduced in the previous Planmeca Compact i model were included, as well as an extensive number of additional languages.

Aesthetics

Beauty is a science that is thousands of years old. The industrial designers at Planmeca know what people consider to be beautiful because they know why. The proportions, the "aerodynamic" look of a console and the poise of a dental unit and so on, they are never born by accident.

The main visual elements of all Planmeca Compact units must communicate to dental professionals that they are looking at an efficient, hygienic and ergonomic dental unit and assure the patients of being treated with modern, safe and reliable equipment.

High demands on hygiene dictate the simplicity in appearance of our products. There are neither any upward-facing seams nor complicated ornaments.

"Exported to all continents, finishing of our products with culture-bound decorative motifs would not be an option anyway. Since our products will be used for decades, their styling must stand the test of time. As we are constantly developing new tools for dental units, the designers must know how the styling of Planmeca Compact units will evolve in the next decades," the designers remind.

Overseeing the manufacturing quality, finishing, painting and assembly are crucial phases in designers' work. "For example the colour of the unit surface can never be defined as "white"or "gray" or something else equally vague. Repeating the exact colours accurately in different materials and paints is not at all easy. This is why we have defined accurate, light wavelengths based NCS-colours to all unit parts plus tolerances for colours. We can scientifically measure exactly whether or not the colour of the new manufactured parts corresponds accurately enough to the defined colour."

The Planmeca industrial design principles:

- Efficient workflow
- Healthy medical team
- Relaxed patient
- Long lasting aesthetic

During mechanical design, computer renderings are used for presentations and discussions.

What makes something look either "right" or "wrong"?

"With modern 3D CAD, we can make sure that all surfaces continue seamlessly, for example, in the area where the handles meet the main console body. By using techniques pioneered in car styling, we can also control all reflections and highlights; the way the highlights travel across surfaces while one walks around the console or how reflections from surroundings "bend" on the surfaces."

These are especially crucial to the looks of the ever glossy Planmeca units. The human eye is very sensitive to gloss and reflection: it is easily noticed if this work is not done properly.

From idea to a finished Planmeca unit

Integrating all relevant parties throughout the product design process ensures a beautiful, functional product that is efficient to manufacture and easy to service.

"Our in-house research, technology and industrial design share the facilities with product development, procurement and production staff, as well as with marketing, sales and management department. This provides a seamless pipeline all the way from early market studies to a finished product."

"It's kind of a feel good thing. We have the best equipment out there. So the soldiers are treated very, very well. I'm excited about that. It makes me feel good that we have some small part in bettering the soldiers."

Michelle L. Bottino, RHS,
Planmeca, Inc., US Government/Direct Sales.

ON THE FRONT LINES

United States military uses Planmeca x-ray equipment all over the world to help diagnose, treat dental situations. Standardised software and dental equipment save in training and maintenance costs. More importantly, it allows the military to provide seamless and high quality, fast dental care anywhere.

The last thing anyone wants is to have one of their soldiers in combat be distracted by a dental emergency, or to be unavailable to serve due to dental problems. Diagnosing soldiers' oral health can take excessive time – not to mention searching for misplaced paper records.

Planmeca ProMax is the x-ray equipment of choice for the entire Department of Defense (DOD). Planmeca provides dental x-ray equipment to US military bases all across the country and around the world.

Digital records

Today, every dental clinic in the United States Army and Air Force has gone digital and uses Planmeca ProMax x-ray equipment. "The digital transition was a must in terms of helping track records for all the service men and women, especially since they are regularly changing locations", says Planmeca's **Michelle L. Bottino.**

"The Army for example has one database for all of their soldiers' dental records. No matter what base the guy or gal goes to, the record will be there. Earlier, as many as 30 % of paper records were misplaced every year".

Bottino gets to experience the gratitude expressed by those thankful to get their hands on a Planmeca ProMax system that can help them do their job and better care for the service men and women.

"I went to the big military conference, AMSUS, and people come up to me, saying, 'Hey, you just rolled out our equipment and it's great to have.' It's a really uplifting feeling." tells Bottino, who is engaged to a soldier.

Efficiency

The speed in which the Planmeca systems produce high-quality images is critical in regards to getting soldiers deployed in a timely basis. With the Planmeca ProMax x-ray system, users can do a standard panoramic x-ray for an overall health of the patient, and the system also allows for extraoral bitewing images.

"Cavities can cause that emergency situation to pop up in the next 12 months," Bottino said of the importance of quickly and accurately diagnosing soldiers before they are sent out.

"They can do two images in about a minute as opposed to about 20 minutes in the old way. It's a huge time-savings."

"The Planmeca ProMax x-ray unit can do extraoral bitewing images and with those you can diagnose caries. That's huge," Bottino said.

With the help of this technology, the military clinics can quickly diagnose and classify the soldiers based on their dental health.

"The deployable soldiers are in a classification that says they're not likely to have any kind of dental emergency in the next 12 months."

Standard training

Another plus to having just one x-ray choice throughout the DOD is that once you are trained to work with and maintain the Planmeca ProMax system, you will be prepared to do so regardless of where the government deploys you.

"The equipment support team is trained on the same equipment," Bottino said.

The same goes for the x-ray technicians. "Since we put the same x-ray in every single dental clinic in the country, there's less training involved."

"Navy ordered a piece of equipment for an undisclosed overseas location," she said. "One of the techs was flown in to be taught how to install and maintain the equipment."

Photo: Courtesy of the US Army

Lower radiation dose and environmental benefits

Retired Air Force dentist Dr. **Dennis D. Stuckey** backs up the importance of electronic record keeping and the speed of digital x-ray units. But he also points out another big plus — reduced radiation exposure.

"The Air Force clinics are 100% digital capable which allows our providers to acquire and view high quality images quickly with less radiation exposure to our patients," said Colonel (Dr.) Stuckey.

Additionally, switching from film to digital allows the military to do away with chemicals involved in processing. This saves time and money - and less chemicals translates into a healthier world for all of us.

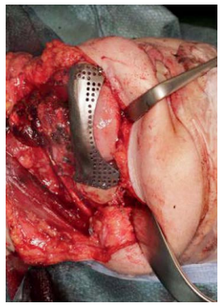
"It's really all about improving the quality of care for our Soldiers, Sailors, Marines and Airman. This project allows us to provide seamless and high quality dental care anywhere."

First published in dentalproductsreport.com, March 15, 2010 by Stan Goff, Executive Editor, Dental Products Report

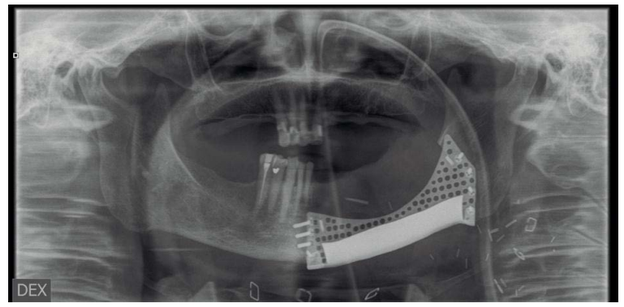
COPY RISTO KONTIO AND JUKKA KANERVA IMAGES HELSINKI UNIVERSITY HOSPITAL

Outstanding results with Planmeca's patient-specific titanium implants and autoclavable guides

Pre-surgery situation



Implant fits perfectly



Post-operative CT

A 81 year old female patient was referred to Helsinki University Hospital, Dept. of Oral and Maxillofacial Surgery. Her main complaint was a growing pain in the left side of her lower jaw. She had suffered from pain for two to three months. Her general health was not good.

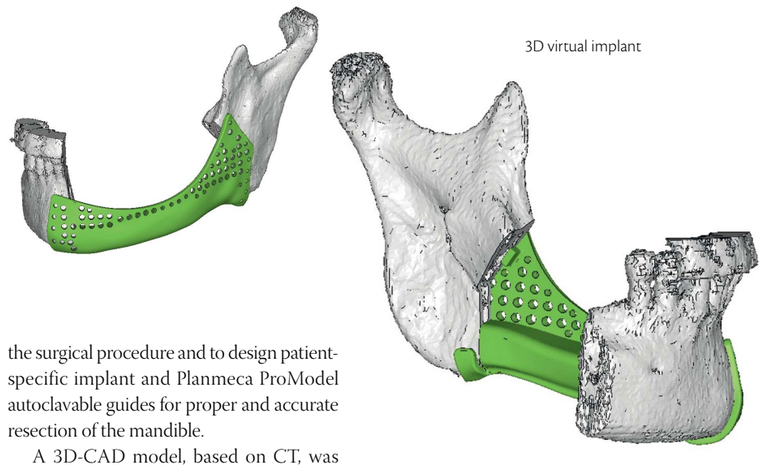
During the clinical examination, a large tumour was observed in the left mandibular gingiva. A partially edentulous upper and lower jaw was observed and the remaining teeth in the lower jaw were from first premolar left to first premolar right. The sensation of left lower lip was normal, indicating no injury of mandible and / or mental nerve.

CT examination revealed a 2 cm x 3 cm tumour tissue, which was invading tooth bearing process of the left mandible. No signs of metastatic lymph nodes were detected. A tissue sample was taken showing the tumour to be a moderately differentiated squamous cell carcinoma.

The decision of operative treatment to remove the malignant tumour was made. Due to invasion to mandible, en bloc mandible resection was mandatory. Because of the inferior general health of the patient any composite flap reconstruction was not possible. The conclusion was that mandible defect should be reconstructed using patient-specific titanium reconstruction plate. The length of operation also had to be minimized because of the poor general health of the patient.

Preoperative 3D planning

The virtual operation was carried out using Planmeca ProModel and individual 3D-CAD technique in order to plan and test the surgical procedure and to design patient-specific implant and Planmeca ProModel autoclavable guides for proper and accurate resection of the mandible.



3D virtual implant

A 3D-CAD model, based on CT, was created in Planmeca. Free margins of 1.5 cm were measured and marked onto the 3D model. Using CAD the resection lines were drawn and virtual bone resection was carried out. The second step was to create autoclavable guides to be able to conduct the clinical resection procedure exactly in the similar manner as the virtual operation.

Finally, the individually-contoured reconstruction plate was designed in Planmeca. Because of t he one-off nature, the patient-specific reconstruction plate does not need to resemble standard reconstruction plates.

The primary CT was taken on 30 August and the operation was performed 4 weeks later. Meanwhile, a biopsy was taken, patient's general health thoroughly investigated, and surgery and anaesthesia plans concluded.

Also, the Planmeca ProModel guides and patient-specific reconstruction plate were prepared.

Operation time reduced

During the operation no difficulties were encountered. Using the extraoral approach the mandible was resected and the tumour removed. The guides were used to guide the resection through exactly in the similar manner as the virtual CAD surgery. Neither tracheostomy nor neck dissection was necessary. The Planmeca ProModel patient-specific reconstruction plate fitted perfectly into the resection area. Finally the soft tissue defect was covered from the intraoral side using microvascular radial fore arm flap.

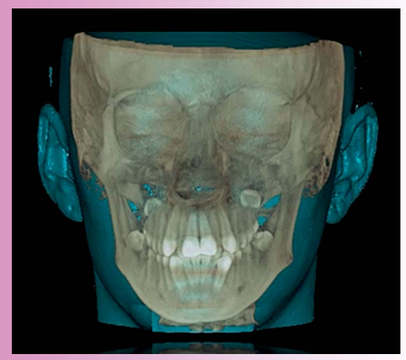
"The operation lasted only 4 hours 30 minutes, because of the exact plan and preoperatively manufactured implants," said surgeon **Risto Kontio** of Helsinki University Hospital.

Patient stayed in the intensive care unit for one day and was discharged from the hospital on the 14th postoperative day.

REFERENCES

Facial skeleton on a desktop

> *Suddenly patients, referrers, and other non-surgical doctors, could understand what I was talking about. Everyone just "got it".*



"In February 2010, **Mr Jouko Nykänen** and **Mr Kare Hanttu** from Planmeca Oy, came to my office in Newcastle, Australia. Though I didn't know it at the time, their visit was to become a personally momentous, life changing event.

In October 2010, I had the pleasure of coming to Helsinki. It's quite a long trip; even when you are flying business class. When Jouko and Kare had come to Newcastle, I had no idea that they had travelled so far. Likewise, I really had no idea about what they were installing for me, the amount of effort that came about in developing what they had installed, or the size of the background team or the institution that was involved in developing their device.

In fact, I really had no idea what I would need their machine for. There was not another one for 15,000 km in any global direction. My colleagues had bought what I thought were similar CBCT machines from Sirona, Morita, Imtec, Gendex, Vatec and Kodak. There was no great enthusiasm from my colleagues as such. All of a bit of an oh-hum, and expensive kind of feel to the whole CBCT industry. I

> *I like "the best". I already knew their other products were "the best". So I gave their machine a good old Aussie go.*

was only buying this machine because the local supplier here in Australia (Henry Schein Halas), and eventually also Jouko, had made such a good argument for it and they seemed such nice guys. And, of course, I had bought Planmeca hardware before.

About me

Maybe I should have started as first here. I have been a little remiss in making personal introductions. Let me cut back a few steps.

I work as a facial reconstruction surgeon in Newcastle. Along a journey of around 20 years of professional training, I've studied in Australia, New Zealand and Singapore, and last year I got an honorary fellowship from the Royal College of Surgeons of England: A small honour. I'm also a Surgeon Lieutenant Commander with the Royal Australian Navy reserves. I have four kids, quite a few staff, all young women who make me look good, and a large wholly-referrer based private practice. I am 42 years old.

My day job consists of rebuilding faces, and jaws, cutting things out, and putting most things back in. Some people think of people like me as glorified over-qualified dentists. Sure I cut out teeth, but usually with other bits of facial anatomy as well.

People try to sell me stuff, thinking that I could probably use it more than a dentist down the road — and selling me a ConeBeam was like selling me a Cooper Mini, when really I was used to Aston Martins; meaning high end radiology services like MRI's, PET scanners, and 64 slice spiral CT scanners. I had thought little of Planmeca's ProMax 3D Max. Just another CBCT, a poor cousin to what I already had access to down the CT road.

In January 2010, I really thought I knew it all. In February, however, what I had in front of me was a machine about which I knew only how to press the "On" button and a promise from Jouko that it did amazing things.

Jouko was too polite to tell me; he is an overwhelmingly polite guy. He's really nice, and very patient. If he was an Aussie, or even worse a Kiwi, he would have been up front, and told me the truth about myself: that I really didn't know everything.

Exploring the device

I was familiar with the 5x5 cm volume, using 100 µm unbinned voxels, useful for local tooth-centric pathology, such as for fine hairline cracks in teeth, or for pre-endodontic canal assessment. Well, that's useful for a general dentist and provides spectacular imaging, but I experimented further.

> *On that next day, after Planmeca had installed my machine and Jouko was on a 26-hour-journey back home to Helsinki, a whole new universe of understanding hit me like a sledge hammer, fairly and squarely, right in the middle of my well developed forehead.*

There were the slightly bigger volumes, 8 x 8 cm and then also 15 x 15 cm. They looked good, with variations between 100 µm to 600 µm voxels. There were spectacular ways of viewing things.

The biggest volume was a massive 34 x 34 cm, at 400 µm resolution, and I took a picture of my own head with it. Interesting, I thought, how such a huge brain was in such a little head.

But a little later in the day, I discovered the 17 x 34 cm volume.

You see I am a facial skeletal surgeon. I love the facial skeleton, for it contains teeth, sinuses, eye sockets, cheek bones, mandibles, maxillas, nostrils and turbinates, and the whole combination of this and that, in whatever strange relationship or pathological deformation. This is the stuff of true-blue maxillofacial skeletal surgeons.

And I had the whole bloody thing on a desktop, infinitely detailed, in different colours, different surface treatments, Hounsfield arbitrated, and with infinite combinations of planar stacks. All of a sudden I could see things, and rotate them, and dissect them out, and the patient was in the next room. Or even better, if they were sitting in the room with me, they could see it all too, in an abstract and unreal, but still very real, representation of themselves.

I could in 5 minutes disseminate 20 years of surgical training and experience, and transplant that into any brain, any intelligence, any person. Suddenly patients, and referrers, and other non-surgical doctors, could understand what I was talking about. Everyone just "got it".

And every patient since have pretty much had this volume scan.

Overnight, this little machine with 18-second scans, sitting in a non-descript little room, all quiet and nice, and hospital white beautiful – completely, wholly, dramatically, revolutionarily – changed my practice.

A whole new world of possibility

I know what you're saying. Maybe I could have felt the same way if I had bought a different machine, or had a different, but similar software programme. Maybe all CBCT machines are the same, and I just don't know it.

But you know what? I do know it. I researched everything that was out there before I bought this machine, and frankly, the CBCT that is out there is uninteresting, and a poor second cousin to real spiral CT.

But this is different! The ProMax 3D Max is very different. I have shown it to my friends who have their own version of a large volume CBCT, and they are jealous.

I had the first Down-Under, and now there are three, and there are more being installed. Now I don't feel so unique, but that's what happens with technology like this: it gets out there, and the word spreads.

More amazing, though, is this thing just keeps getting better. When I came to Helsinki to meet with the R&D team lead by **Ms Helianna Puhlin,** and the software team genius **Henri Veisterä,** I was lead into a journey of their ongoing work which enthralled and amazed me.

Their new Planmeca ProFace, with 3D digital capture of facial contours in real colours and with real hair is set to revolutionize dentistry, cephalometry, and orthognathics like you wouldn't believe.

New surface treatment programmes, four-dimensional viewing, enhanced virtual-implant design platforms, biomodel production, and customized facial implants; all this is on the horizon too.

This thing has changed my professional life, and it is the new face of maxillofacial surgery for the 21st Century. It eclipses what is around in the current market place, and all of it fits into a small little room, in this small practice, on the very edge of the Pacific Ocean; near the very antipodes of Helsinki.

Thanks Jouko, and Helianna, and Henri, and of course **Mr Heikki Kyöstilä** who is the owner of this fantastic Finnish company.

You all provided me the greatest gift in allowing me to buy your beautiful machine."

Dr Paul Lloyd G. Coceancig
MB ChB BDSHons MDSOMS FDSRCS ad eundem England FRACDSOMS
Consultant Facial Reconstruction Surgeon
Surgeon Lieutenant Commander,
Royal Australian Navy (R)

REFERENCES

A first class workspace

Do you want a workspace that offers you opportunities that no other unit can? Then look no further than the Planmeca Sovereign for unbeaten flexibility and comfort.

The chair is more comfortable than any other. The backrest and headrest can be adjusted electronically so they fit the patient perfectly. The chair itself can turn through 270 degrees so that it's always facing the patient as he/she enters the treatment room, no matter how your clinic is furnished.

All instruments are controlled by software that's simple to set up to suit your way of working. The graphical display means it's no trouble at all – and you retain an overview. That's real usability.

The entire suction unit can be bent right around the chair so that it's only the work of an instant to change from right-handed to left-handed users. And, of course, the unit comes with all the latest hygienic refinements including a water treatment facility, suction cleaning system etc.

If you're considering a new unit, and you want something that's a class apart, why not arrange a demonstration of the Planmeca Sovereign?

"Flexibility was the watchword when we chose new units. We chose to invest in eight Planmeca Sovereign units for our clinic because of the sheer number of ways they can be adjusted to suit the needs of the individual user and patient."

"Another key parameter was patient comfort, and our patients' reactions have been very positive. Planmeca Sovereign fully meets our flexibility and comfort requirements."

Dentist Kim Berthelsen, Ribe Tandklinik

Units

- Symmetrical functions for both right and left-handed users
- The suction tube cleaning system
- Heat and noise are a thing of the past with wthe SingLED operation light
- Automatic headrest adjustment
- Wireless foot control
- Graphical multi-user interface

DESIGN MATTERS

Planmeca's industrial designers give form to dental and X-ray units, taking care of ergonomics, usability, and hygiene – and wrapping it all up into an easily serviceable, aesthetic package. And most of all they create a pleasant user experience. Acting as users' representatives the designers goal is to determine the user needs and wishes, and to figure out how to apply them in the design.

From left:
Tero Pihlajamäki, Usability Specialist
Kari Malmén, Industrial Design Manager
Timo Silvonen, Industrial Designer

COPY LEENA AALTONEN IMAGE PERTTU SIRONEN

Ergonomics for everyone

Today, the need for ergonomics is steadily growing. The European Society of Dental Ergonomics (ESDE) states that 50 to 75 percent of dentists suffer from back, neck, and shoulder pain even when at rest. Approximately two thirds of the students will not finish the dental school healthy.

An ergonomic dental unit might require bigger investment, but Planmeca's industrial design manager **Mr Kari Malmén** claims it is definitely worth it. If you need to retire early for disability caused by compromised ergonomics, it can end up costing more.

"Also, if the x-ray unit cannot be adjusted high enough, tall patients might not be able to stand still during the x-ray compromising image quality", says **Mr Tero Pihlajamäki,** Usability Specialist at Planmeca.

Ergonomics is the number one mission of the Planmeca industrial designers. With products exported to nearly hundred different countries, the designers face the challenge of making the equipment to work for all types of users. "For example, if the delivery arm is situated too far, it would be difficult for a very short person to reach the necessary instruments when working in the 12 o'clock position," states **Mr Timo Silvonen,** Industrial Designer at Planmeca.

Invisible usability = good usability

Pihlajamäki summarises usability: "Usability is good when the user does not have to think about it."

Tero Pihlajamäki has visited several practices and followed the work of dentists and their assistants to learn how they actually work. This helps in designing solutions that really benefit the users.

Over the years usability has become more and more important and the users have become to expect it. "The dental unit needs to adapt to the dentist's way of working, not the other way round", Pihlajamäki says.

With good usability design user's actions can be predicted. With Planmeca Sovereign for example the capability to adapt to different users and their way of working was achieved by creating extremely flexible software that allows easy configurations, additions and upgrades.

By using presets the user can change the way the unit behaves with a push of a button. "The user will intuitively use the interface as it was meant to be used", Pihlajamäki tells.

"No" to decorations, "Yes" to high-end hygiene

Successful hygiene control dictates ergonomic, decoration free design of the units. According to Malmén nothing is done for purely aesthetic reasons: there cannot be holes or cavities that are difficult to clean and the surfaces must be easy to wipe.

Daily repeated cleaning cycles demand special materials. The designers experiment with different materials and compounds to find the most resistant and most compatible materials.

"It is a genuine product development paradise – we never get bored!" Silvonen says.

Sharp servicing

Quick-to-open covers and accessible electronics significantly increases the efficiency of servicing. One may think that easy servicing is not that big of a design deal since it is not performed very often. "A technician may service the same unit only once a month but actually that same technician goes from one clinic to another servicing many units every week, even every day", Pihlajamäki explains.

Clinics that receive dozens of patients every day and use the units in shifts, greatly benefit from efficient servicing as elevated operating rate will also elevate service frequency. "In the end it is the dentist who pays the bill. Ideally the technician acts as a "silent salesman" passing the word on easily serviceable units," Pihlajamäki says.

Lasting and appealing aesthetics

As the units are further developed, increasing complexity of electronics and cabling is challenging for the aesthetics. The designers have to figure out how to fit everything in while maintaining easily approachable and appealing design which affects both patients and the image of the practice. "Aesthetics certainly play a role in patient comfort. Patient is more likely return to the same practice later on when treated with high-quality patient-friendly unit", says Silvonen

The life cycle of Planmeca products is very long and, therefore, everything has to be made right the first time: unlike the designers in companies with relatively short product life cycles, the designers at Planmeca do not get a chance to correct errors in the next release half a year later.

The products of the global company have to please the universal aesthetic eye. Unlike car manufacturers, for example, Planmeca cannot release new, super-trendy models, or models targeted European and Asian models, every year.

"Our products have to appeal to a very versatile group of people and maintain their charm for at least 20 years," Silvonen says.

See also the article on the new user interface for Planmeca Compact i on page 26.

FROM REQUIREMENT SPECIFICATIONS TO WORKING UNIT

"Since the very first project meeting until when it is time to print the brochures and beyond, the designers work in tight cooperation with many professionals, including mechanical, electronics and software designers as well as purchase and production departments.

Process starts by defining the product requirements. Based on the perception of how the user would use the unit, requirement specifications are drafted together with product development. Using these specifications as the basis, some ideas are sketched and then evaluated. The mechanics department will then determine the necessary measures and dimensions and how the device will be composed.

The user interface is created as part of the design project, and it is developed and tested in co-operation with mechanics and electronics department as well as with end-users. When the actual mechanics and electronics design begins, our role is to act as messengers between different product divisions so that everything advances according to the original design idea."

Planmeca donates top-level dental devices to the dental clinic in Japan tsunami region

Planmeca Oy announces its donation of a Planmeca Compact i dental unit along with a Planmeca ProMax 3D s imaging unit to temporary dental clinic that is being set up by the Japanese government and Japan Dental Association in the tsunami region.

"We found out that there are temporary dental clinics to be established in Tohoku region with the support of Japanese government. We would like to do our share in contributing to the rebuilding efforts of this tsunami-ridden region. With these dental devices modern, high-quality dental care is available for people in the crisis area," says Mr. Heikki Kyöstilä, the president of Planmeca Oy.

The design of the Planmeca Compact i dental unit has been strongly steered by the importance of ergonomics and uncompromised safety of the dental team as well as highest level of hygiene. There are over 25 000 Planmeca Compact i dental unit installations and users around the world.

The Planmeca ProMax 3D s digital imaging unit is designed to obtain complete information on patient anatomy in the minutest detail. The unit complies with a multitude of diagnostic requirements: those of endodontics, periodontics, orthodontics, implantology, dental and maxillofacial surgery, and TMJ analysis. Planmeca ProMax 3D s unit is ideal for imaging with a smaller field of view: the imaging size is optimal for e.g. single implant and wisdom tooth cases, as well as for implant surgery and orthodontic treatment.

The announcement of this donation was made in cooperation with Planmeca's distributor in Japan, the GC Corporation. The temporary dental clinic is expected to be set up in Tohoku region in June.

CSA MEMBERSHIP FOR PLANMECA

Planmeca was granted Chinese Stomatological Association (CSA) membership in dental equipment category on the first of December 2010.

Planmeca's worldwide leading brand, the company's status as a major dental supplier in Chinese market, and its long term support for CSA were the criteria for granting membership. Planmeca and Sirona are the only foreign members in the dental equipment category that also includes two Chinese companies.

Chinese Stomatological Association is an independent academic organization consisting of scientific and technological personnel in the field of Stomatology. Established in 1951, it was formerly known as Stomatological Society of the Chinese Medical Association.

Instead of sending out Season's Greetings 2010, Planmeca donated a Planmeca ProMax 3D device to a global charity, Mercy Ships. The 3D X-ray system will be installed onboard the Africa Mercy. This way also the poor will have access to fast, low-radiation and high-quality diagnostics.

Mercy Ships

Mercy Ships has operated a fleet of hospital ships in developing nations since 1978, providing free surgery and medical and dental care. As part of its holistic approach to health care Mercy Ships also works actively in community projects.

Dental and Oral Diseases in Developing Nations

Dental help is almost non-existent in much of West Africa. The most common oral diseases are dental cavities and periodontal (gum) disease. Mercy Ships aims to prevent and reduce the effects of a lack of oral health care by providing dental treatment and dental hygiene education and training. Mercy Ships conducts free mobile dental clinics, providing relief from infected or rotting teeth, performing extractions and inserting fillings.

Since 1978, Mercy Ships has treated over 95,800 dental patients with more than 228,100 dental procedures performed.

Photo: Mercy Ships

Africa Mercy

- Length 152 m
- Breadth 23.7 m
- Gross Tonnage 16,572
- Built 1980 Elsinore, Denmark
- Crew Capacity 474
- Main Engines 4 B&W (3120 kW each)
- Draft 6.0 m

The Africa Mercy hospital covers approximately 1,200 square metres. It has a total of 78 patient beds. Annual medical capacity is approximately 7,000 surgical procedures onboard.

- In 1978, Don Stephens purchased the first hospital ship, the Anastasis.
- In 2007 the Africa Mercy, largest of the four hospital ships and world's largest non-governmental hospital ship, was launched.
- Funding is provided primarily through private donations.
- Since 1978, Mercy Ships has had more than 2.2 million direct beneficiaries and has provided services in developing nations valued at more than $808 million.
- Mercy Ships has over 1,200 volunteer career staff and crew from over 40 nations and over 2,000 short-term volunteers annually.

Albania • Algeria • Argentina • Australia • Austria • Azerbaijan • Bahrain • Belarus • Belgium • Bolivia • Bosnia and Herzegovina • Brazil • Bulgaria • Canada • Chile • China • Costa Rica • Croatia • Cyprus • Czech Republic • Denmark • Egypt • Estonia • Finland • France • French Polynesia • Germany • Greece • Guadeloupe • Hong Kong • Hungary • Iceland • India • Indonesia • Iran • Iraq • Ireland • Israel • Italy• Japan • Jordan • Kazakhstan • Kenya • Kosovo • Kuwait • Latvia • Lebanon • Libya • Lithuania • Macedonia • Malaysia • Malta • Martinique • Moldova • Montenegro • Morocco • Mozambique • Netherlands • New Caledonia • New Zealand • Nigeria • Norway • Pakistan • Panama • Peru • Philippines • Poland • Portugal • Reunion • Romania • Russia • Saudi Arabia • Serbia • Singapore • Slovakia • Slovenia • South Africa • South Korea • Spain • Sri Lanka • Sudan • Sweden • Switzerland • Syria • Taiwan, R.O.C. • Tanzania • Thailand • Trinidad • Tunisia • Turkey • Ukraine • United Arab Emirates • United Kingdom and Northern Ireland • United States • Venezuela • Vietnam

Planmeca products are presented locally by distributors near you.

Find your local dealer: www.planmeca.com

10027180/0911/en

PlanWorld magazine is published by PLANMECA