Dental School Redevelopment

A geek, a dentist, & a builder

Emerson Pratt

University of Otago

- Established 1869
- 20,838 students (18,457 EFTS)
- 1/4 of students postgraduate
- 4,029 FTE staff
- Presence from Invercargill to Auckland
- 15 Departments rated in top 100 worldwide
- Rated 1 of the 16 most beautiful campus in the world
- Won Tertiary Prime Minister's Supreme Tertiary Teaching Excellence Award 6 of last 7 years

SAPERE AUDE

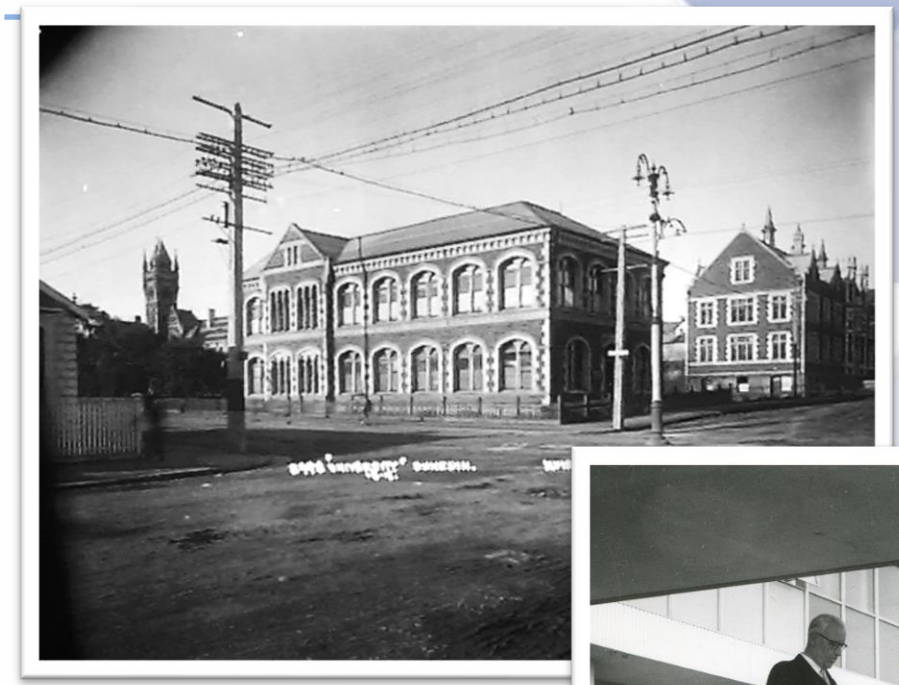
150 YEARS 1869-2019

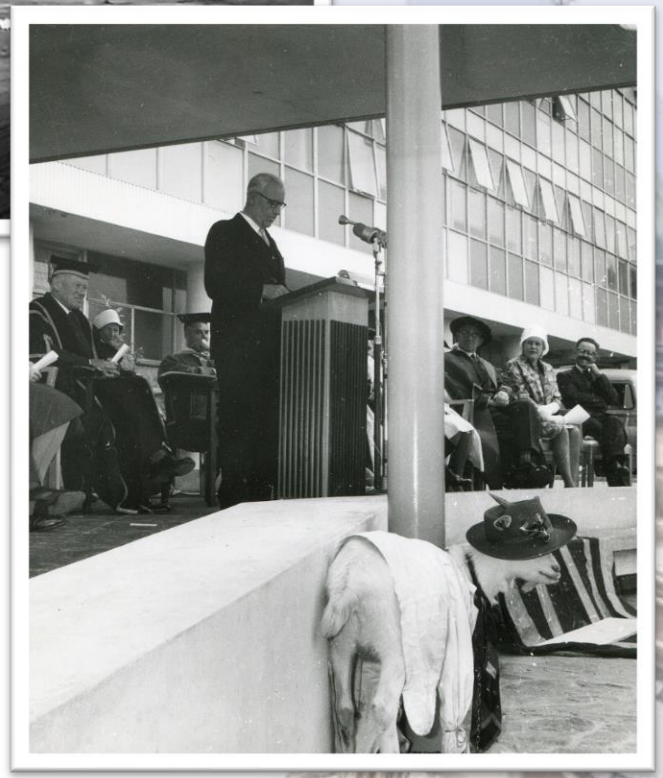
Dental School Redevelopment

- New Zealand's only dental school
- First opened 1907
- Ranked in top 20 worldwide
- Current dental school opened in 1961
- Currently 160 dental chairs

By the numbers (annually):

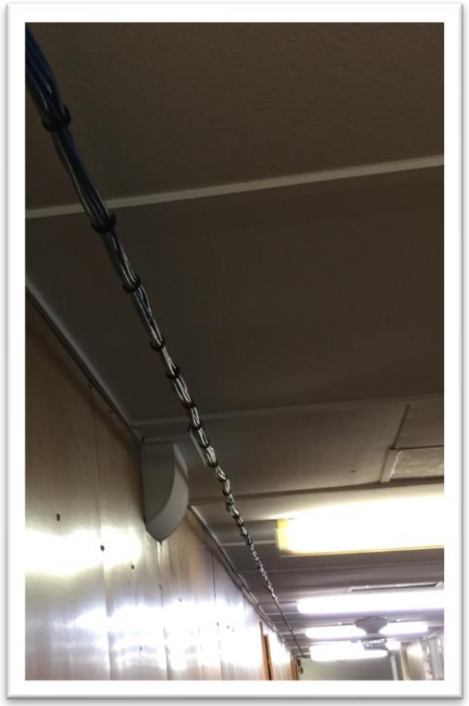
- Over 18,000 patients
- 80,000 consultations
- 52,000 invoices

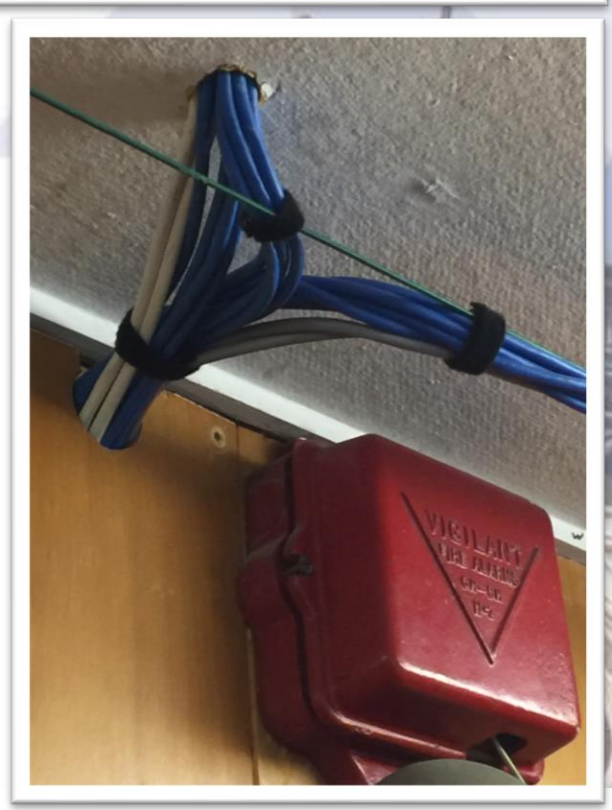




Current Dental School

- Current building not up to acceptable standard
- Unable to upgrade current building
- Stores 5,000,000 paper patient records
- Networking capacity of building well past design
- Unable to roll out digital x-rays as files took 4-5 minutes to open





New Dental School

- Two phases
  - Phase 1 – 214 chair Clinical Services Building (opens ~~*2018*~~ 2019)
  - Phase 2 – Teaching/Administration (opens 2020)
- 220 dental chairs (including full surgery)

A digitally integrated national centre for dentistry

- No paper-based patient records or x-rays

New Dental School

- Dental School redevelopment planned for last 20 years

- Finally got underway in 2015 with ground-breaking 2016

- Just for fun:
  - Te Kaika 4 chair community clinic as part of holistic medical practice (opened Feb 2018)
  - Auckland clinic (34 chairs) providing dental health care to south Auckland, and student placement opportunities (opens 2020)

How to build a building

4 years before you break ground

- Decide how much you have to spend on a building
- Write business case
- Talk to department regarding requirements
- Modify business case
- Approve building

1 year before ground break

- Hire architect, design building
- Put figure in for AV/IT… *(pointless asking AV/IT - they are only going give a figure that doesn't fit out budget!)*
- Cost building
- Cut 1/3 of department's 'requirements'

How to build a building

24 months before building opens

- Start construction
- Cut costs (remove another 1/3 of building costs, oh and some of the AV/IT budget)

9 months before opening

- Contact IT to design ‘AV/IT stuff’. Give them 2 weeks to do it because the building is nearly finished

8.5 months before opening

- Tell IT/AV that they don’t have that much in ‘their’ AV/AV budget

How to build a building

2 weeks before opening

- AV/IT team get access to to do the work they said would take them 8 weeks install.. In 2 weeks

‘Practical Completion’

- Building ‘opens’

+6 months

- Department realises half the things they thought would be in building are not

+12 months

- IT comes in and adds network ports and AV that weren’t included in original design but are critical to department operation (at IT department’s cost)

February 2017

Mike: Emerson…. How would you like bit of a change?

Me: Sure…. Are you thinking cappuccino or latte instead of the usual flat white?

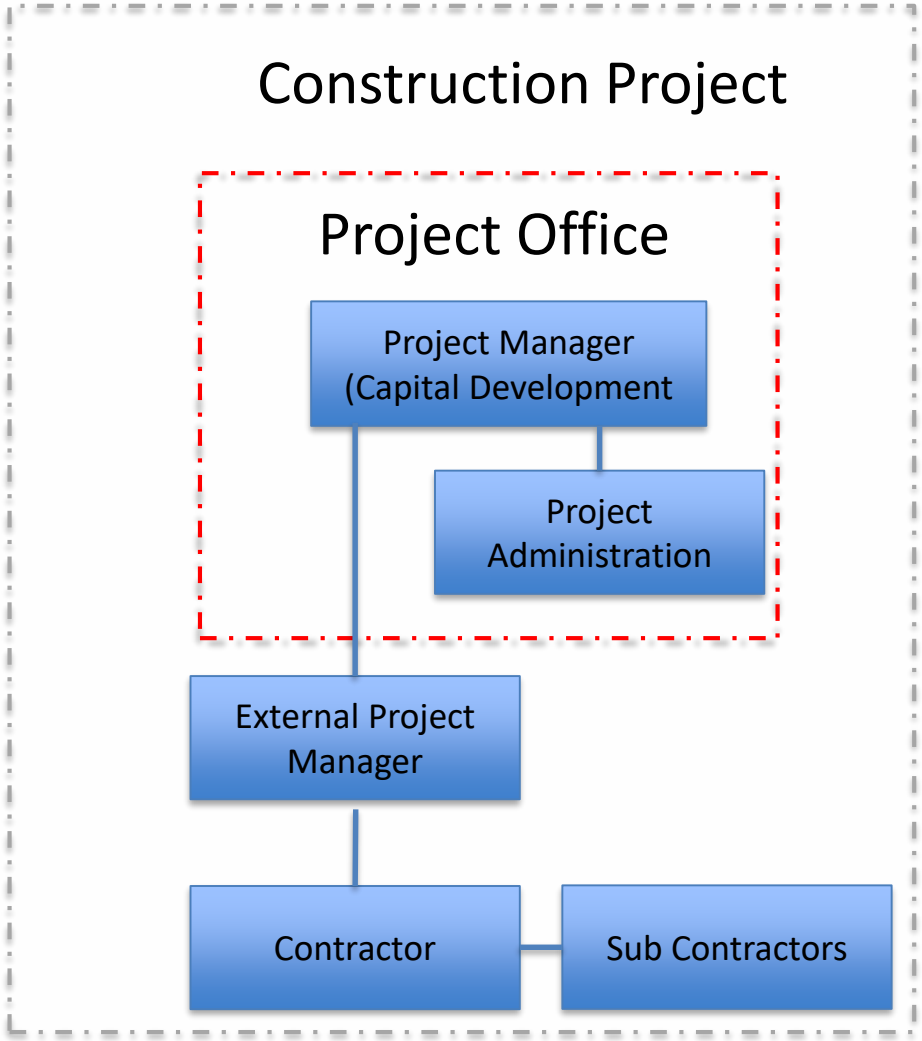
Mike: I was thinking manage the Dental School ICT project

Me: When do they start planning?

Mike: 3 years ago, it opens in 16 months.
You have no budget and no staff

Me: Make mine a martini. . .

Traditional Project Office



- Dental School (Customer)
- University IT/AV
- Property Services

This had to change

- Project office normally only contained members from University's Capital Development team
- Department that the building is being built for had involvement during requirement gathering but very little during construction
- ITS and other internal service providers brought in as consultants to the project

How *not* to build a building

- Buildings might meet the department's physical needs but did not consider 'why' they required it or 'how' they would operate in it once completed

- Departments often took a 'hands off' approach with the only concern being 'when will the building be finished'?

- The design process didn't include IT; rather IT is bolted onto the building once the design is complete

- Facilities use an 'educated' guess for an IT budget figure

How *not* to build a building

- Facilities hands building over at completion on Friday and waves goodbye (normally after afternoon tea); department moves in Monday

- Departments often ill prepared to inhabit new facilities

- Department spends the next year adapting its work practices to ‘fit’ the new building

Outcomes in the old world

- Facilities often didn't meet department's expectations
  - Or at least didn't meet their 'actual' requirements

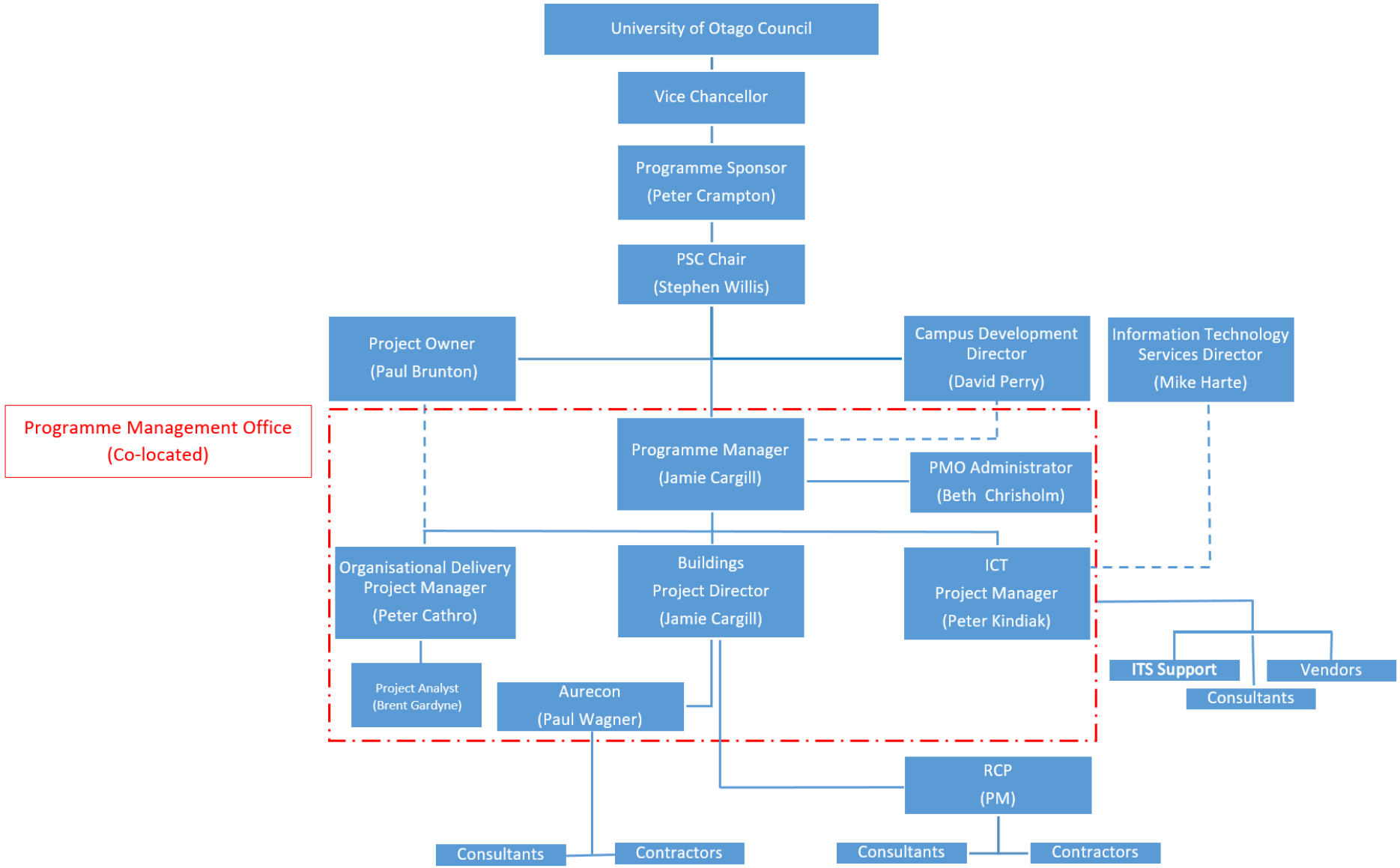
- IT/AV requirements often didn't meet requirements
  - Not enough
  - Not in the right place
  - Difficult to use
  - Equipment different to rest of campus and hard for central IT to support

- Not unusual for IT to have to retrofit the building at great cost within 12 months

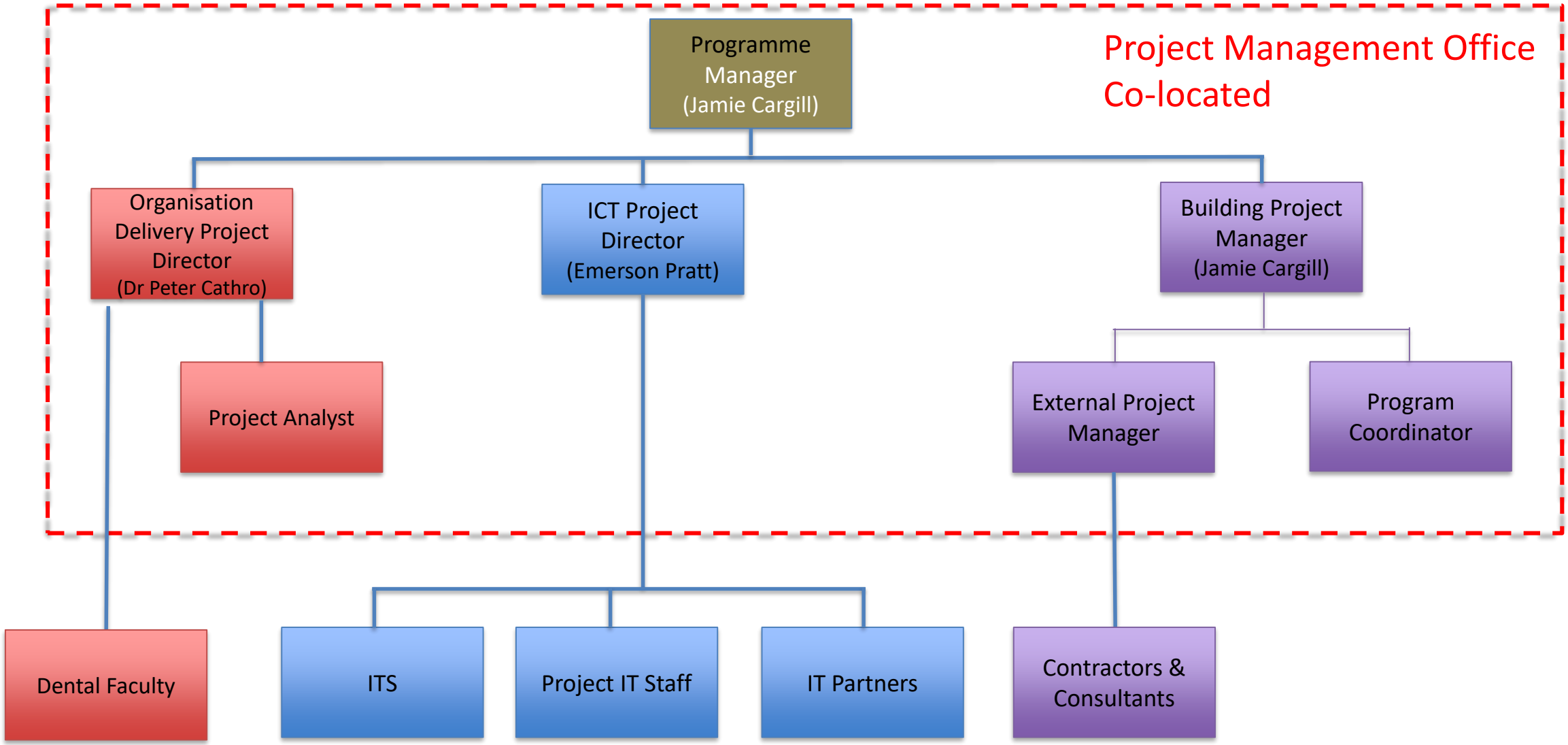
A brand new world

- Realisation that we had to do better
- We knew our Campus Development team were really, really good at building buildings,
  - but they are terrible IT Professionals,
  - and even worse dentists

Out with the old model in with the new



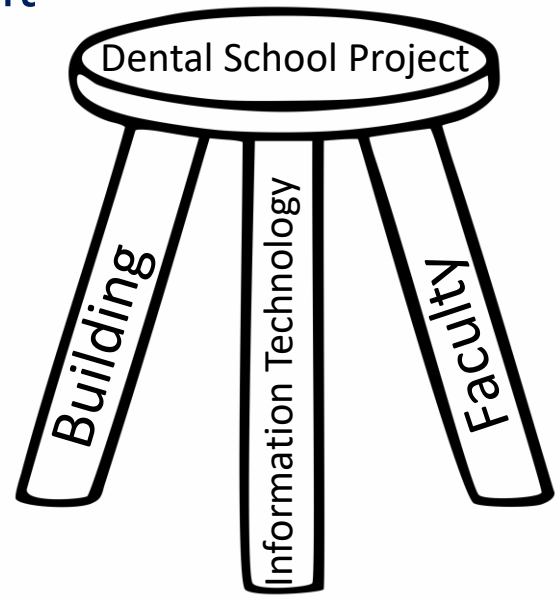
A New Dawn


Project Management Office
Co-located
Programme Manager (Jamie Cargill)
Organisation Delivery Project Director (Dr Peter Cathro)
ICT Project Director (Emerson Pratt)
Building Project Manager (Jamie Cargill)
Project Analyst
External Project Manager
Program Coordinator
Dental Faculty
ITS
Project IT Staff
IT Partners
Contractors & Consultants

New Dental School Project Office

New Project Structure

- Department had to be actively involved throughout the process
- We aren't building a building! We are building a dental hospital
- The school's vison of '*A digitally integrated national centre for dentistry*' - which the business case to build the building was built around - meant IT could not be a afterthought



New Project Structure

- While each of the 3 project managers had areas of expertise, all jointly responsible for all aspects of project
- All members sat in on as many meetings/discussions as possible
- Developed a culture where each member could raise concerns outside their speciality
- Each lead own EPT (Executive Planning Team) and User Groups
- Each member sat on the Project Steering Committee (Chaired by PVC Health Sciences and included COO, Chancellor, Dental School Dean, Director of IT, Director of Finance, Director Capital Development, Director of Property Services)

Advantages

- Better understanding of customers' requirements
- Customer becomes part of the process and not just a bystander in it
- Provided validity in discussion regarding design and any 'value management' discussions
- Mistakes are discovered and fixed before they are a problem
- The all important 'coffee conversations' happen every day
- You don't just get the 3 project managers… you get all their networks as well

AETM

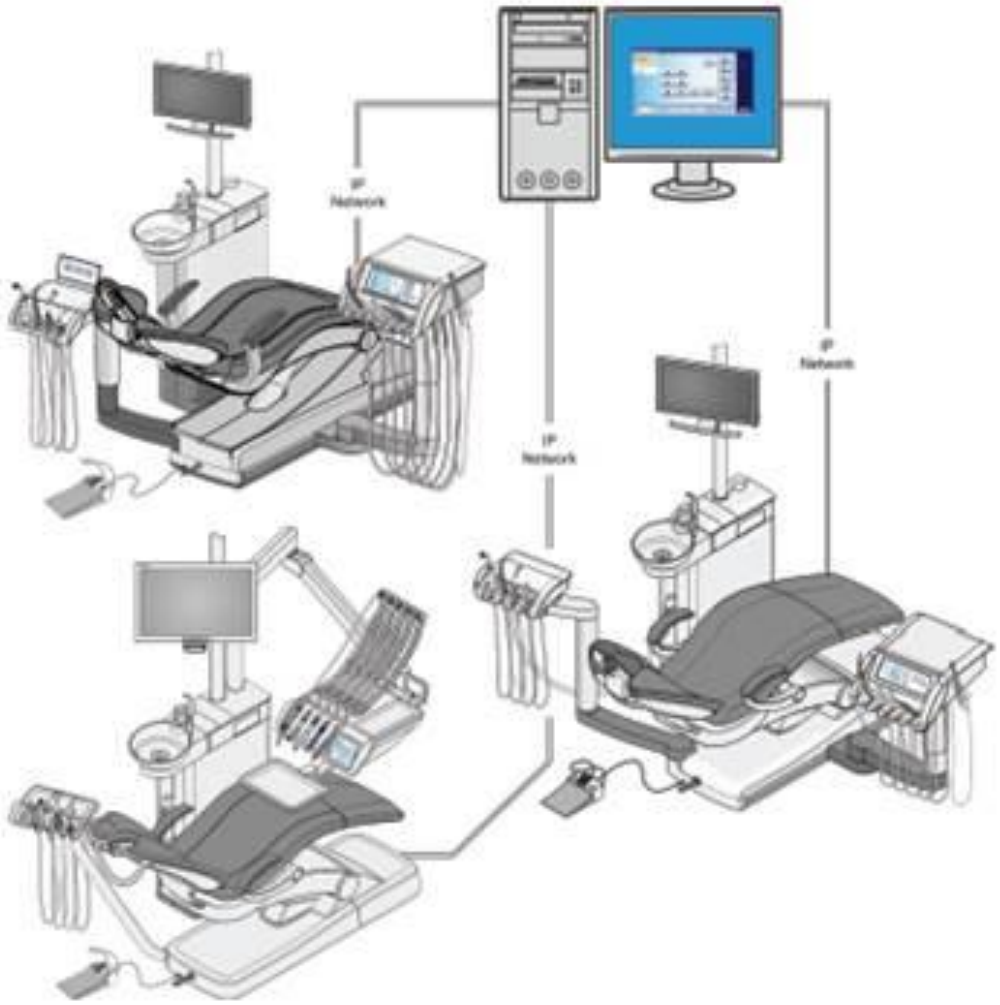
- Represents 32 Universities Australia, New Zealand, Samoa, & affiliate members in South Africa & UK
- Partner with sister organisations SCHOMS (UK) & CCUMC (US) which represent 200+ universities
- Industry training partnership with AVIXA
- Scholarships (International Conferences)
- Annual Conference & Awards evening

Commissioning planning is key

- For every minute you spend designing the building, spend the same time in commissioning planning
- This needs to be led by the Faculty, and include **all** the faculty
- The words “How we do things” should be banned
- Develop scenarios that cover all aspects of staff, student, patients, & equipment’s journey through the building
- Where possible, run simulations as early as possible (does the CSSD trolley fit in the lift?)
- Prepare ‘what if’ plans

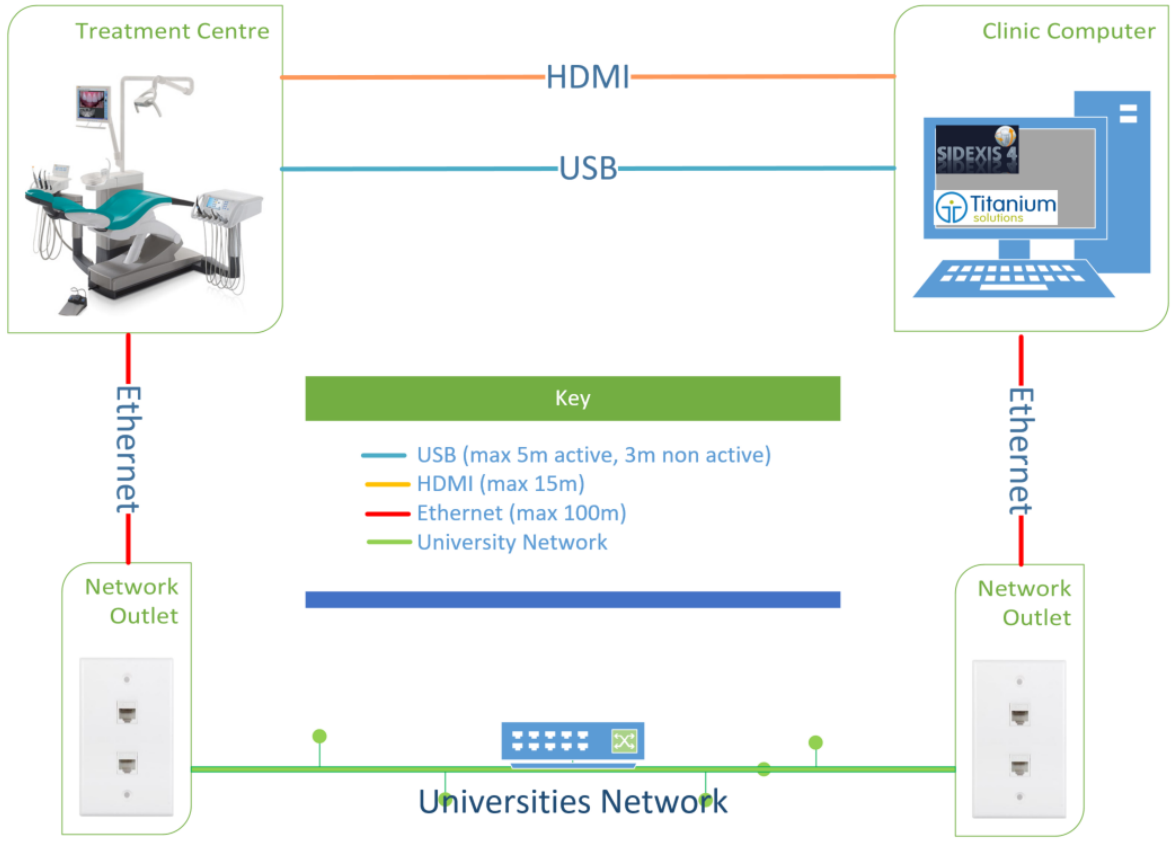
Lost in Translation

"The chair connects to the network via the computer?"



Lost in Translation

Options 3 – Patient Centre connection to Clinic Computer & Network

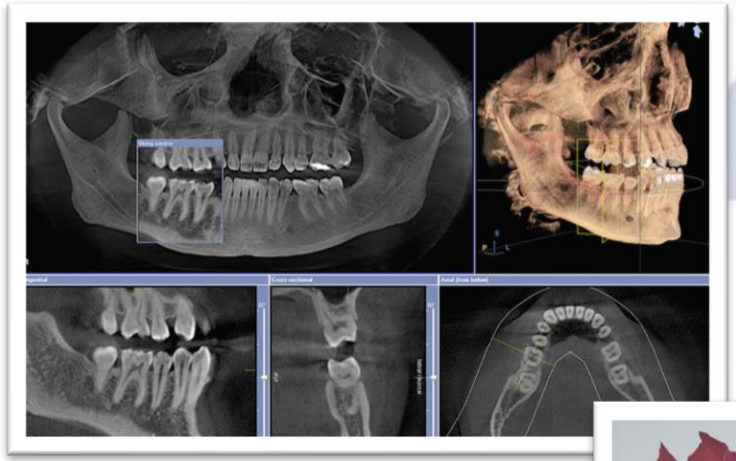


So. . . What is the Dental School ICT Project?

- 8 projects (and a Project Manager)
  - Patient Management System
  - CAD/CAM
  - Patient Communication
  - CSSD
  - Oral Pathology Patient Management
  - Intraoral Digital Scanners
  - Oral Pathology Scanner
  - 3D Printer

- $4.7m budget

- Approved by University Council 17th September 2017



But it's not an IT Project

- It wasn't really an IT project…. It is really a People Project

IT is easy…. People are hard

- For some it is changing processes they have done the same way for 45 years

- There was a real desire to do the same as we are doing now… but just on a computer
  - The 'ebook' textbook effect *(Don't get me started… oh & 'live' streaming!!)*

- Process, Process, Process (how & why?)

- Training, Training, Training (and maybe a bit more training)

January

June

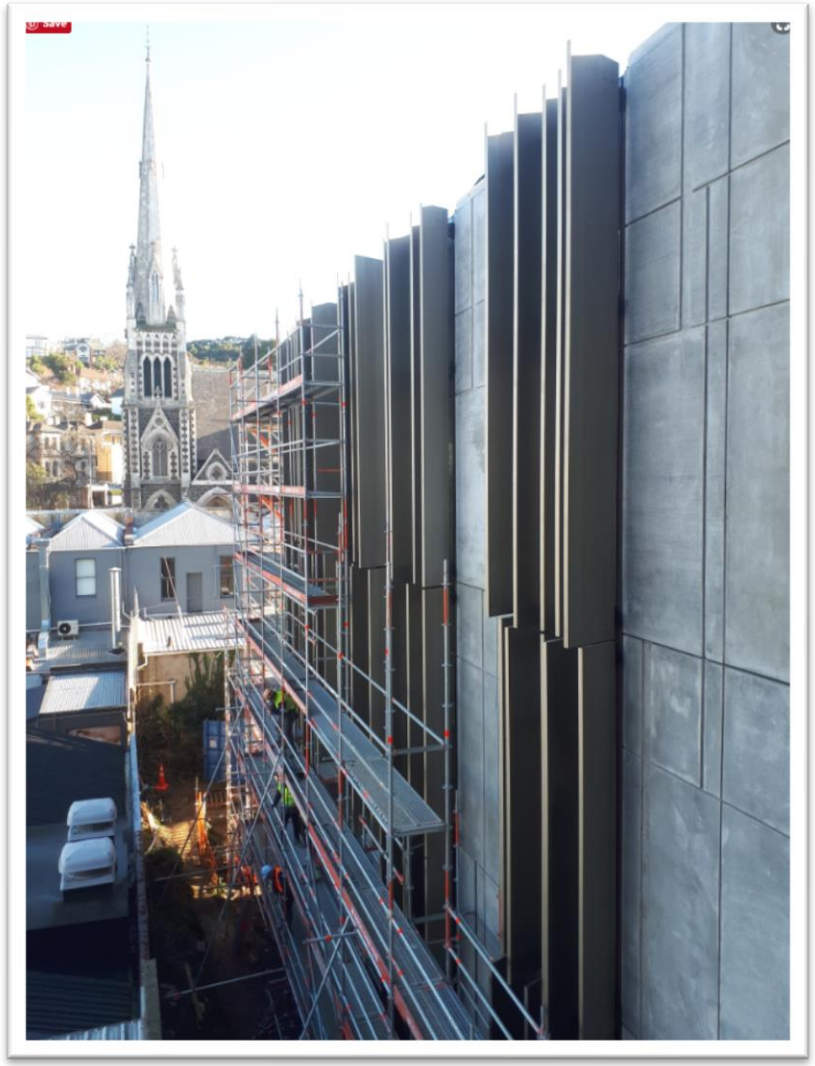
November 1st

November 15th

December 1st

March

July



October

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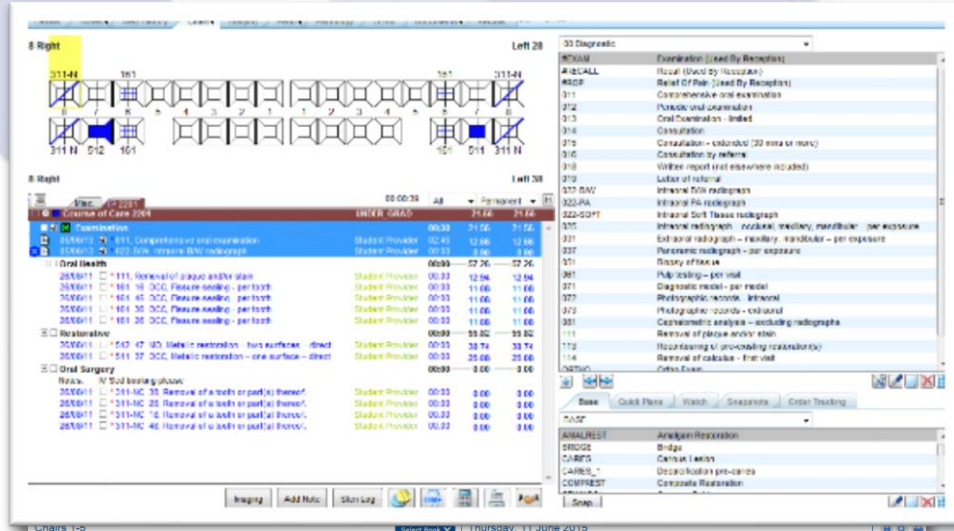
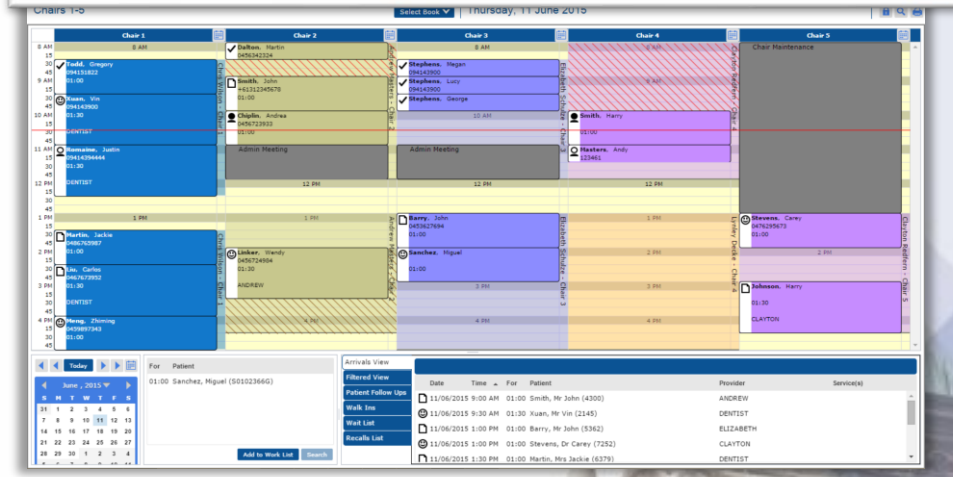
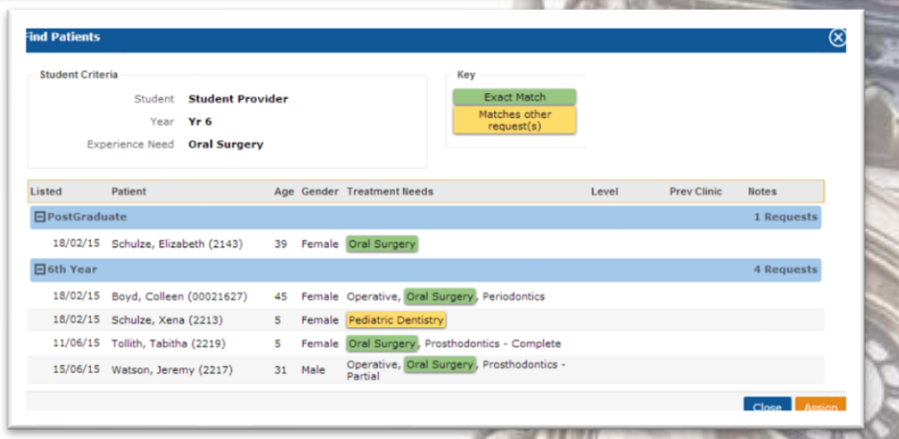
Questions?

(1) Electronic Patient Management Software

- Faculty of Dentistry clinicians (staff and students) will be able to:
  - Access patient records chairside and conduct all processes currently conducted on paper electronically
  - Take digital photographic images and digital radiographs and integrate them with the electronic health records
  - Access these records on any device throughout the Dental School and potentially the world… securely!







(1) Electronic Patient Management Software

(1) Electronic Patient Management Software

- Active/Active virtualised environment over two data centres
- Considering Active/Active between Dunedin & Auckland

- Due to 3D manipulation requirements of x-ray image, client computers require dedicated graphics cards
  - Roughly 250 client machines deployed/updated using SCCM/AppV

- X-ray images range from 5MB (2D) to 5GB (3D)
  - Potential 1,000 images a day
  - Need to be kept 10 years

(2) Computer Aided Design / Computer Aided Manufacturing (CAD/CAM)

- Students and faculty will be able to design and mill implants on site

(2) Computer Aided Design / Computer Aided Manufacturing (CAD/CAM)

Scan

Plan

Mill

Harden (Fire)

(3) Patient Communication Reception Solution

- Kiosk patient check-in allowing improved patient flow through the building. Less time spent queuing by patients and the reduction of bottlenecks at the reception desks
- Improved telecommunications with the ability to improve patient experience
- Timely triage and appointment scheduling
- Improved waitlist management allowing improved utilisation of clinical chairs
- Increased learning opportunities for students and revenue income for the Faculty

(3) Patient Communication Reception Solution

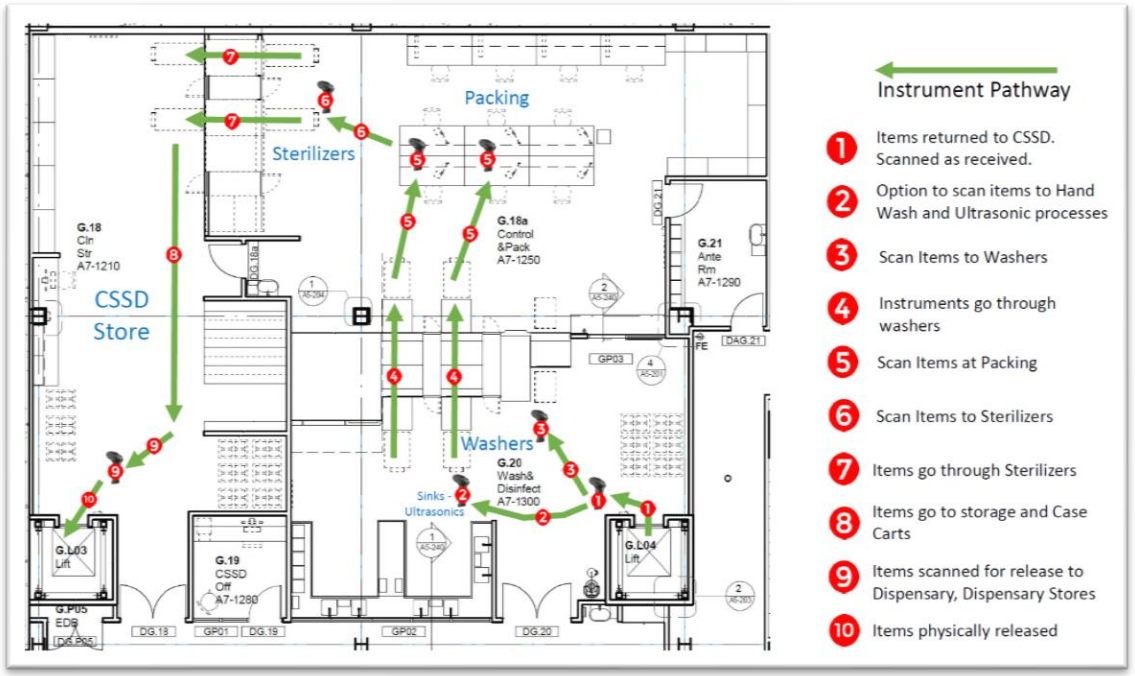
- Really it is a call centre

- VoIP call centre functionality. Can be routed to a number of different locations in the university
  - Dunedin will be able to act as redundant call centre for Auckland and vice versa

- Scripted triage ensuring urgent calls get routed to clinician

(4) CSSD (Central Sterilisation Services Department)

- System (software, scanners, etc) to ensure equipment is tracked through the sterilisation process and subsequent use to ensure patient, student, and staff safety

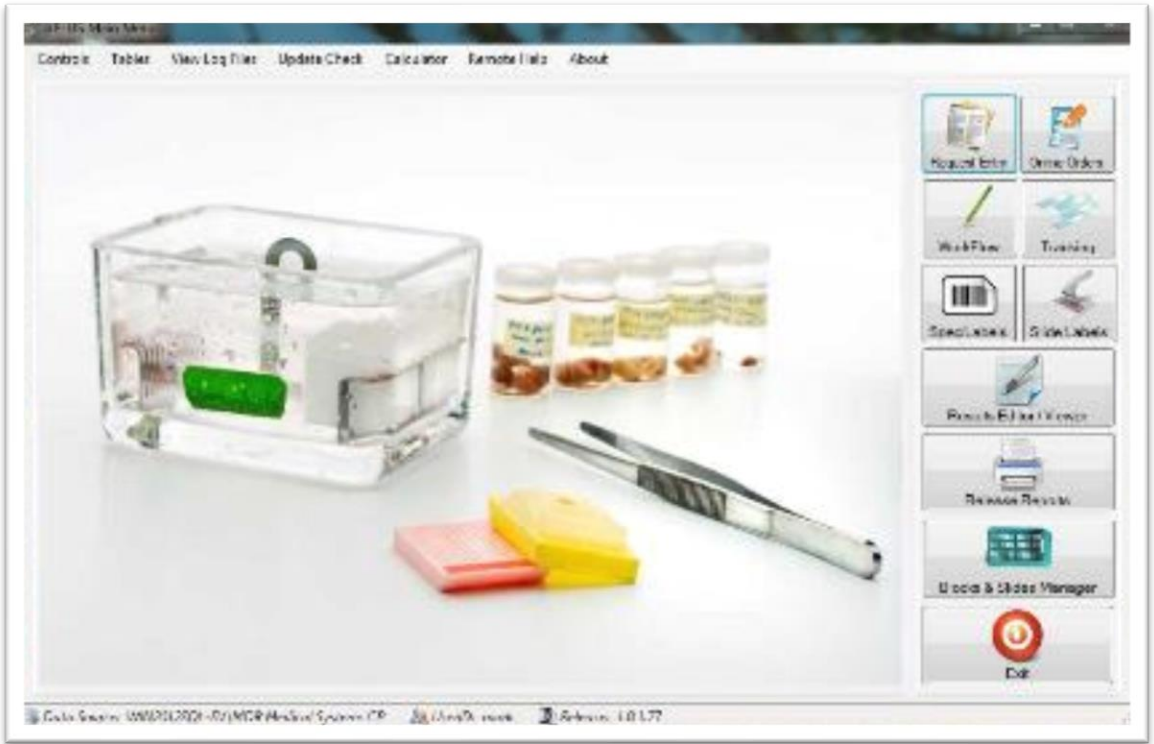


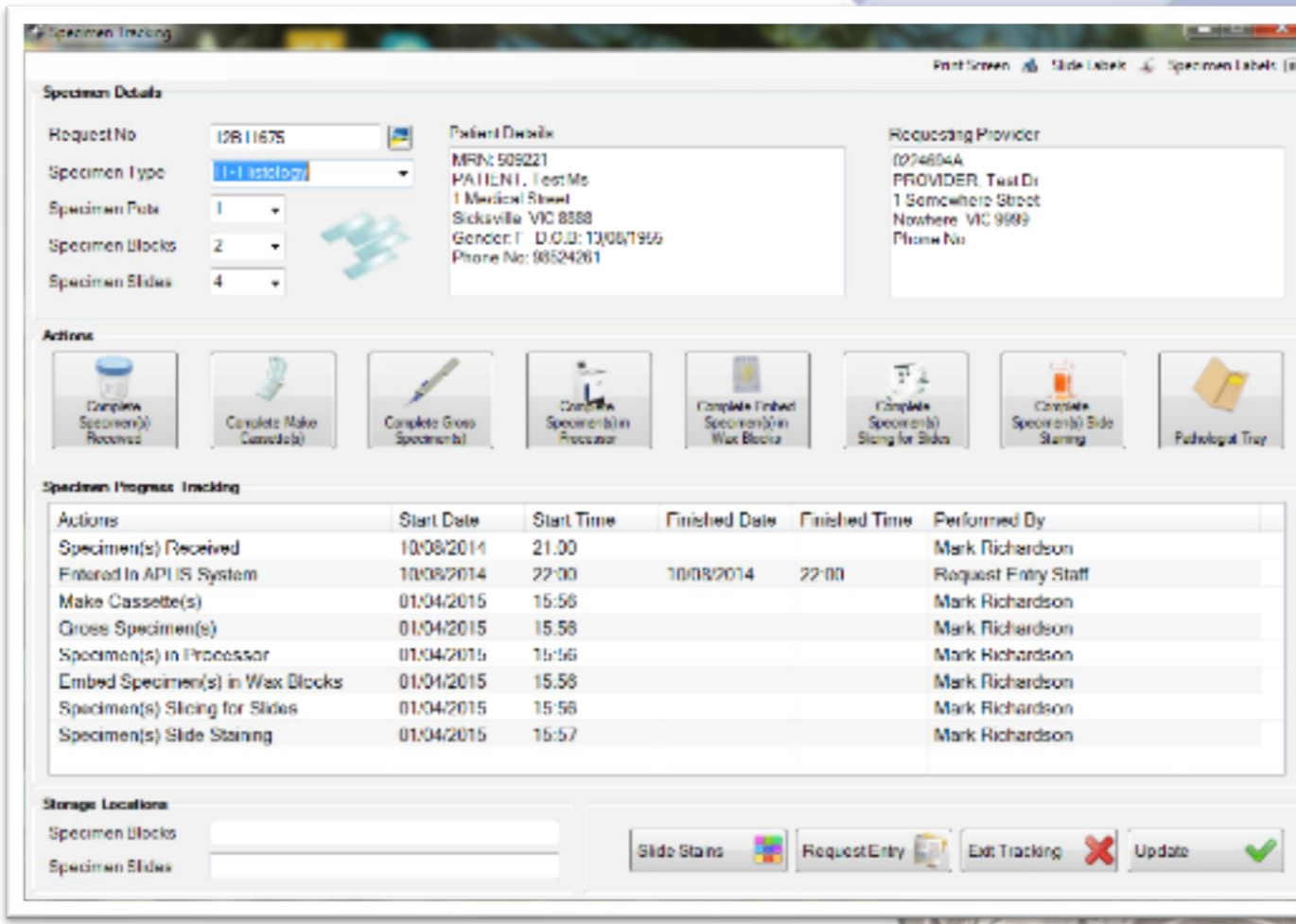
(4) CSSD (Central Sterilisation Services Department)

- Laser etcher engraves each item
- Approx 250 barcode scanners
- Items are:
  (1) Scanned at packing table
  (2) Leaving store
  (3) At chair before use
  (4) Before entering washer

(5) Oral Pathology patient management system

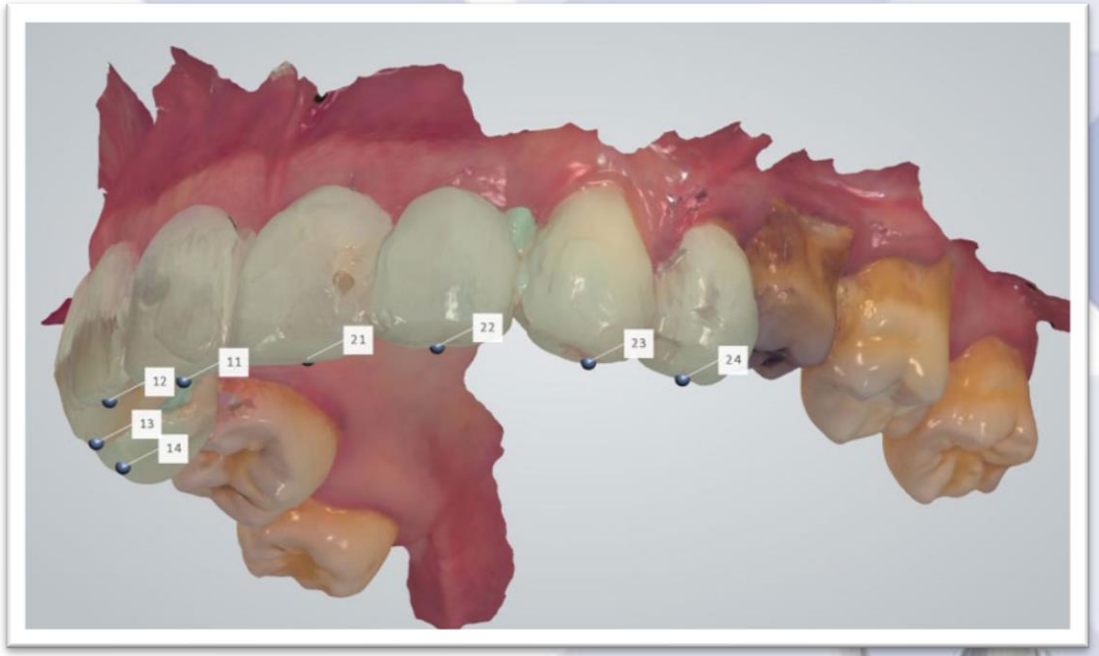
- Pathology process management
  - Receiving specimens
  - Processing
  - Reporting





(6) Intraoral Digital Scanner

- Open format image files which allows the scans to be used by multiple systems, such as CAD/CAM and 3D printers, as well as various research applications
- Scans are ‘non touch’ allowing for safer and more comfortable dental impression process for both patient and clinician
- Replace traditional moulds which were invasive to create and difficult to store



(7) Pathology digital scanner

- Digitise glass slides to allow them to be viewed on monitors and to enable better communication and consultation with pathologists and clinicians worldwide

(8) 3D Printing

- Allow the 3D printing of bite plates, dentures, implant guides, replacement teeth, as well as other body parts such as artificial ears