Project Title

SMART Digital Solutions for Tooth loss: Partial Denture Workflow Innovation

Project Lead and Members

Project lead: Dr Yu Na

Project members:

Organisation(s) Involved

National Dental Centre Singapore

Healthcare Family Group(s) Involved in this Project

Allied Health

Applicable Specialty or Discipline

Dental / Dentistry, Geriatric Medicine

Project Period

Start date: Not indicated

Completed date: Not indicated

Aims

Usage of digital workflow including scan, automatic design and 3D printing to, create denture design and generate 3D model of RPD for more efficient patient service.

Background

See poster appended/below

Methods

See poster appended/below

Results

See poster appended/below

Conclusion

The product, SMARTRPD, will empower users with suggested RPD designs with just an intra-oral digital scan from the patient. The software will allow the dentist to make the final clinical assessment/modification in both 2D template and 3D visual inspection of the RPD before sending for production.

Project Category

Care & Process Redesign

Quality Improvement, Design Thinking,

Technology

Assistive Technology, Digitalisation, Mechanical Equipment, Automation

Keywords

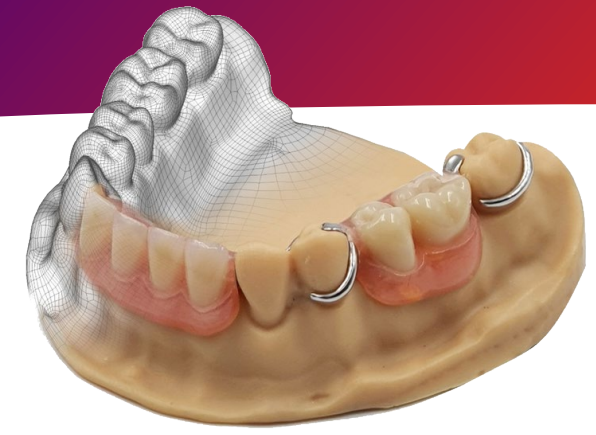Digital workflow, Scan, Automatic Design, 3D printing, Denture Design, Intral-oral digital scan, Production

Name and Email of Project Contact Person(s)

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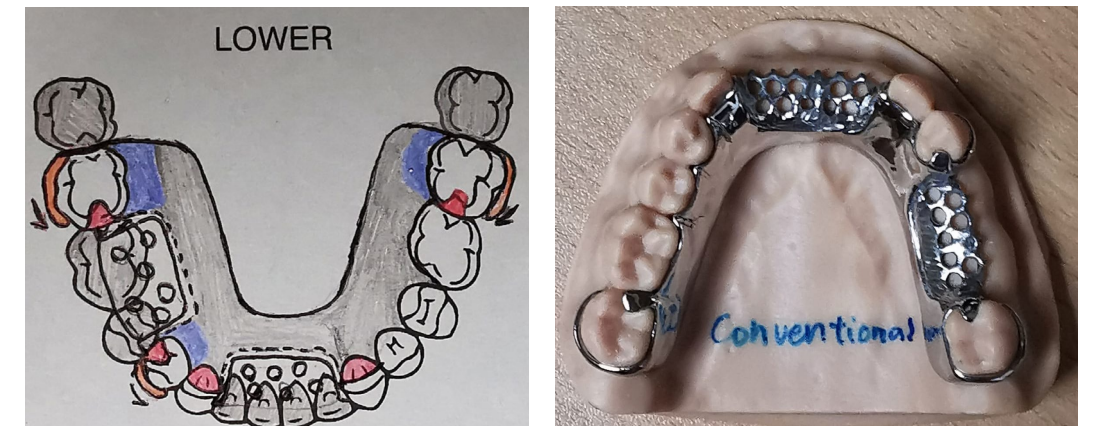# SMART Digital Solutions for Tooth loss: Partial Denture Workflow Innovation

Objective

Usage of digital workflow including scan, automatic design and 3D printing to, create denture design and generate 3D model of RPD for more efficient patient service.

Problem Statement

- High prevalence of edentulism among elderly in Singapore
- Aging Society spurs demand for affordable RPDs.
- RPD: labour intensive with low profit margins
- Hand-drawn designs hinders productivity
- Craft production is not sustainable

Input: Hand-Drawn Design **Output:** 3D Model of metal chrome framework
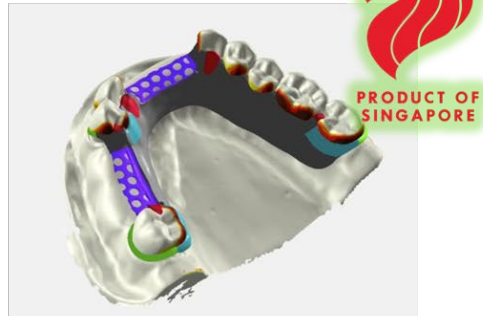
Approaches SmartRPD Digital Workflow

- Digital Scan
- Auto-RPD Design Generation
- 3D printing for denture fabrication

Software Solution

- Cloud-based case storage & retrieval
- RPD Design Toolkit
- Graphical Model Result Inspection
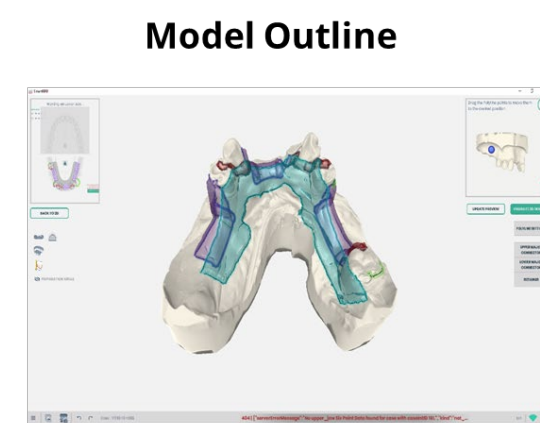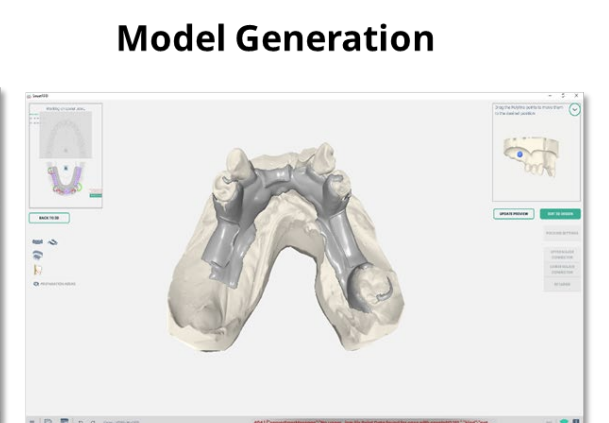- 3D Component Polyline Editing Functionality

Scan
(Enhanced Intra-oral)
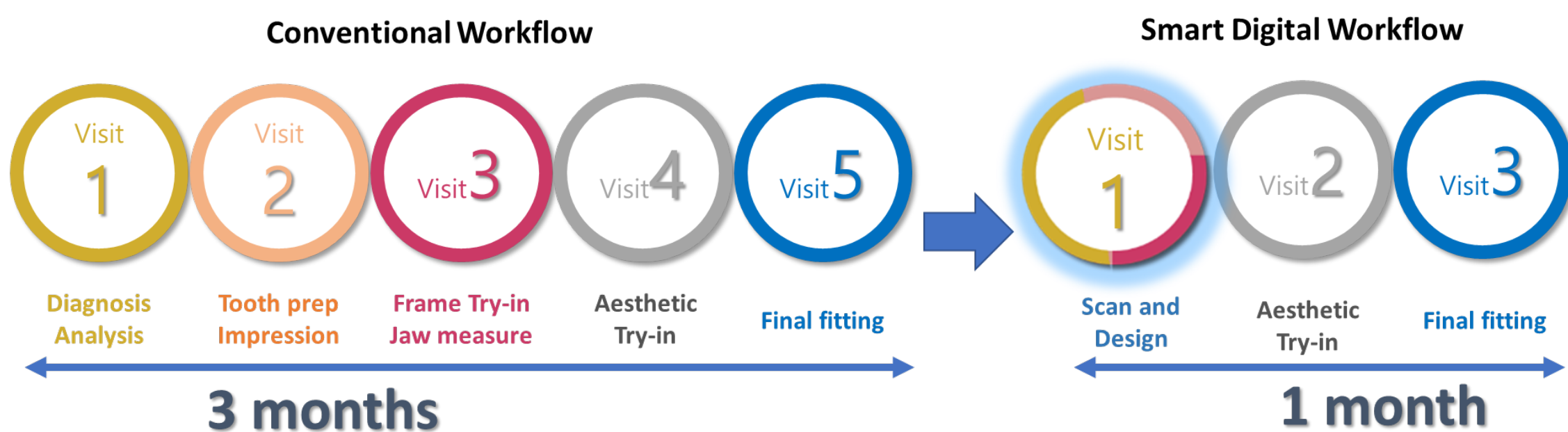
Intelligent Design
(SmartRPD)

3D Print
(Additive Manufacture)

Model Outline — RPD Component Outline

Model Generation — 3D Model of RPD

Conventional Workflow

Visit 1	Visit 2	Visit 3	Visit 4	Visit 5
Diagnosis Analysis	Tooth prep Impression	Frame Try-in Jaw measure	Aesthetic Try-in	Final fitting

3 months

Smart Digital Workflow

Visit 1	Visit 2	Visit 3
Scan and Design	Aesthetic Try-in	Final fitting

1 month

Outcome

The product, ***SMARTRPD***, will empower users with suggested RPD designs with just an intra-oral digital scan from the patient. The software will allow the dentist to make the final clinical assessment/modification in both 2D template and 3D visual inspection of the RPD before sending for production.

Institute of High Performance Computing
IHPC

National Dental Centre Singapore
SingHealth