



Australian e-Health  
Research Centre

# Innovative implemented tools for outpatient clinic scheduling

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Australia's National Science Agency

## Innovative implemented tools for outpatient clinic scheduling

Vahid Riahi<sup>a,1</sup>, Liz Cooper-Williams<sup>b</sup>, Sankalp Khanna<sup>b</sup>, and Rajiv Jayasena<sup>a</sup>

<sup>a</sup>*The Australian e-Health Research Centre, CSIRO, Melbourne, Victoria, Australia*

<sup>b</sup>*The Australian e-Health Research Centre, CSIRO, Brisbane, Queensland, Australia*

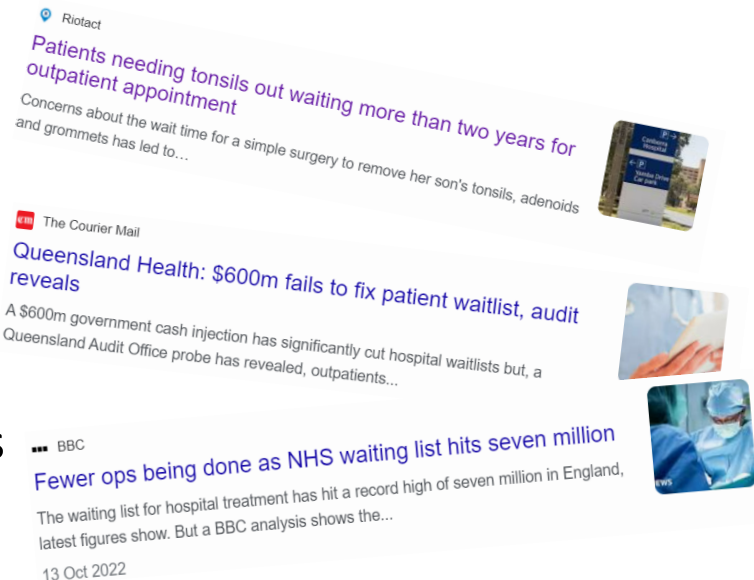
**Abstract.** Every year there are approximately three million new specialist clinic appointments at local hospital networks in Victoria. CSIRO, in collaboration with Austin Health, have developed two algorithms to assist with waitlist management in their outpatient specialist clinics. This study describes the implementation of these algorithms in software tools developed to support their use and trial in the clinical setting at Austin Health. We discuss the system design and development of both these software tools. We also review the implemented workflow of the tools and discuss how these tools seek to improve current systems.

**Keywords.** specialist clinic, template planning tool, next available appointment



# Background

- Waiting times are a major health policy concern
- Austin Health
  - Specialist Clinics: over 265,000 appointments every year
- Waiting list delays occur in many Specialist Units





# Our solution

- We developed two solutions to support improved clinic scheduling and management
  - Next Available Appointment
  - Template Planning Tool
- Main aim:
  - Waitlist visibility to the clinicians at the time of consultation
  - Provide realistic scheduling, increased productivity of staff, and timely care delivery for patients
  - Optimal allocation of resources across the New Urgent, New Routine, and Review appointment



# Next Available Appointment

- Provides a method to estimate a suitable date for a patient's next appointment
- Notify the clinician if the requested time frame is not available
- Allow the clinician to manage the risk involved in a patient's appointment being delayed

The screenshot shows the 'Austin Health Specialist Outpatient Appointment Scheduling Clinic Waitlist Visibility Tool'. It is a multi-step form for selecting clinical services and viewing waitlist information.

**Select a clinical service**

- Step 1. Unit:** Cardiology
- Step 2. Care Provider:** Doctor 19263
- Step 3. Appointment Type:** Rev Pri Cardiac Arrhythmia

**Step 4. Set search period for availability in more than 7 weeks**

- Enter review period:** 2
- Select Timeframe:** ☐ Weeks, ☒ Months
- Review Period is 2 Months**

**Not available**

**Next Available Appointment is in**

**5 months with a waitlist of 68**



# Template Planning Tool

- A collection of models and the current waitlist to provide a prediction capability for specialist clinic waitlist management
- Ability to investigate “what if” scenarios up to two years into the future by varying key model parameters

The screenshot shows the 'Add a new Template Planning Simulation' interface for Austin Health. It includes a CSIRO logo, a title bar, and several input sections. The 'Select clinical services' section has three dropdown menus for Clinic, Care Providers, and Appointment Services. The 'Set priority systems for new urgent patients' section has a toggle for 'Overbooked appointments per week'. The 'Create what-if scenarios by setting weekly parameters for new simulation' section has three input fields for New Patients (0), Reviews (4), and Discharges (2), each with a multiplier of 1.00. Below these are 'INITIAL TOTAL' labels: (0) for New Patients, (4) for Reviews, and (2) for Discharges. An 'Advanced >>>' link is on the right. At the bottom, there is an 'Email' field with 'tpi@test.com' and 'Run Simulation' and 'Reset' buttons.

Austin Health  
Specialist Outpatient Appointment Scheduling

## Add a new Template Planning Simulation

Select clinical services

Clinic Care Providers Appointment Services

Set priority systems for new urgent patients

☐ Overbooked appointments per week

Create what-if scenarios by setting weekly parameters for new simulation

New Patients 1.00  
0  
INITIAL TOTAL (0)

Reviews 1.00  
4  
INITIAL TOTAL (4)

Discharges 1.00  
2  
INITIAL TOTAL (2)

Advanced >>>

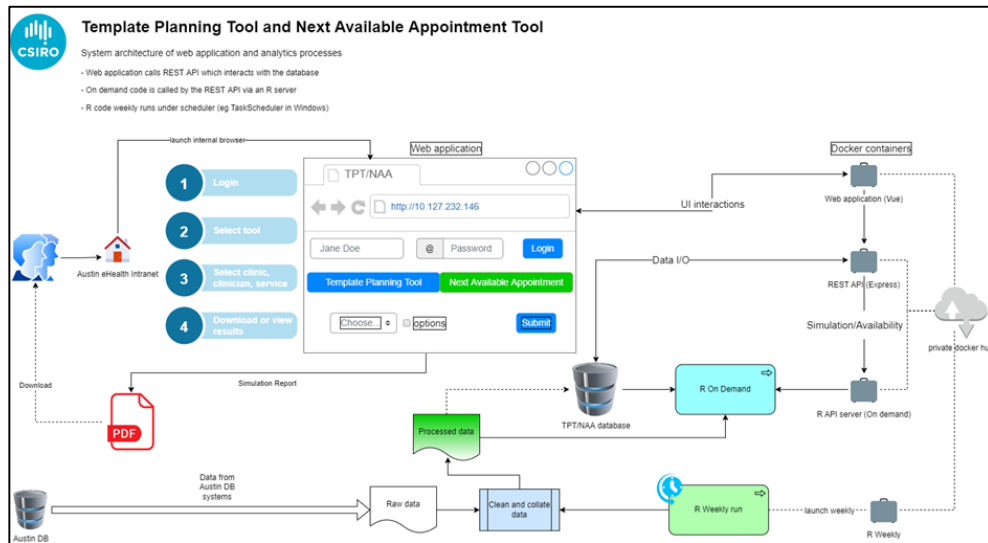
Email  
tpi@test.com

Run Simulation Reset



# Methodology & System Design

- Developing a User Interface (UI) in Vue
  - An open-source JavaScript framework used for building front-end user interfaces
- Developing a backend server in NodeJs Express
  - A web application framework that provides a REST API
- Simulation Processing
  - Developed in R language





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# Thank you

## Health and Biosecurity

Vahid Riahi  
Research scientist

+61 03 9662 7197  
vahid.riahi@csiro.au  
aehrc.csiro.au/

## Health and Biosecurity

Sankalp Khanna  
Team leader

+61 7 3253 3629  
sankalp.khanna@csiro.au  
aehrc.csiro.au/

## Health and Biosecurity

Liz Cooper-Williams  
Senior software engineer

+61 7 3214 2435  
liz.cooper@csiro.au  
aehrc.csiro.au/

## Health and Biosecurity

Rajiv Jayasena  
Group Leader

+61 3 9662 7383  
rajiv.jayasena@csiro.au  
aehrc.csiro.au/

## Health Intelligence @ CSIRO AEHRC



Health System Productivity & Efficiency  
Operational & Clinical Decision Support  
Evidence-driven Policy & Healthcare Delivery