Applying a design process to a neuropsychological rehab unit: The role of systems modelling and simulation

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Collaboration for Leadership in Applied Health Research and Care
East of England

Outline

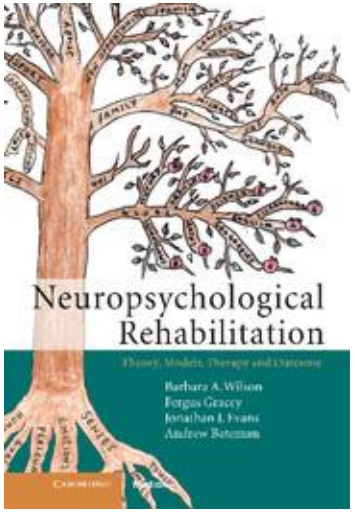
1. Service description
2. The healthcare design process: the role of modelling and simulation
3. The process
4. The outcomes
5. Observations and new questions

SERVICE DESCRIPTION

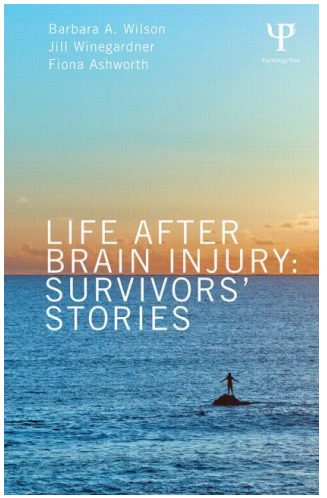
The Oliver Zangwill Centre (OZC) for Neuropsychological Rehab.

- A world class centre
- Provide high quality outpatient assessment and rehabilitation for individuals recovering from brain injury.
- Commit to “continually learn from our clients, apply the latest research findings, evaluate our service and investigate ways to improve neuropsychological rehabilitation.”
- High complexity but low volume service
- Goals
  - Excellent rehabilitation
  - High quality research
  - High quality education

Princess of Wales Hospital, Ely

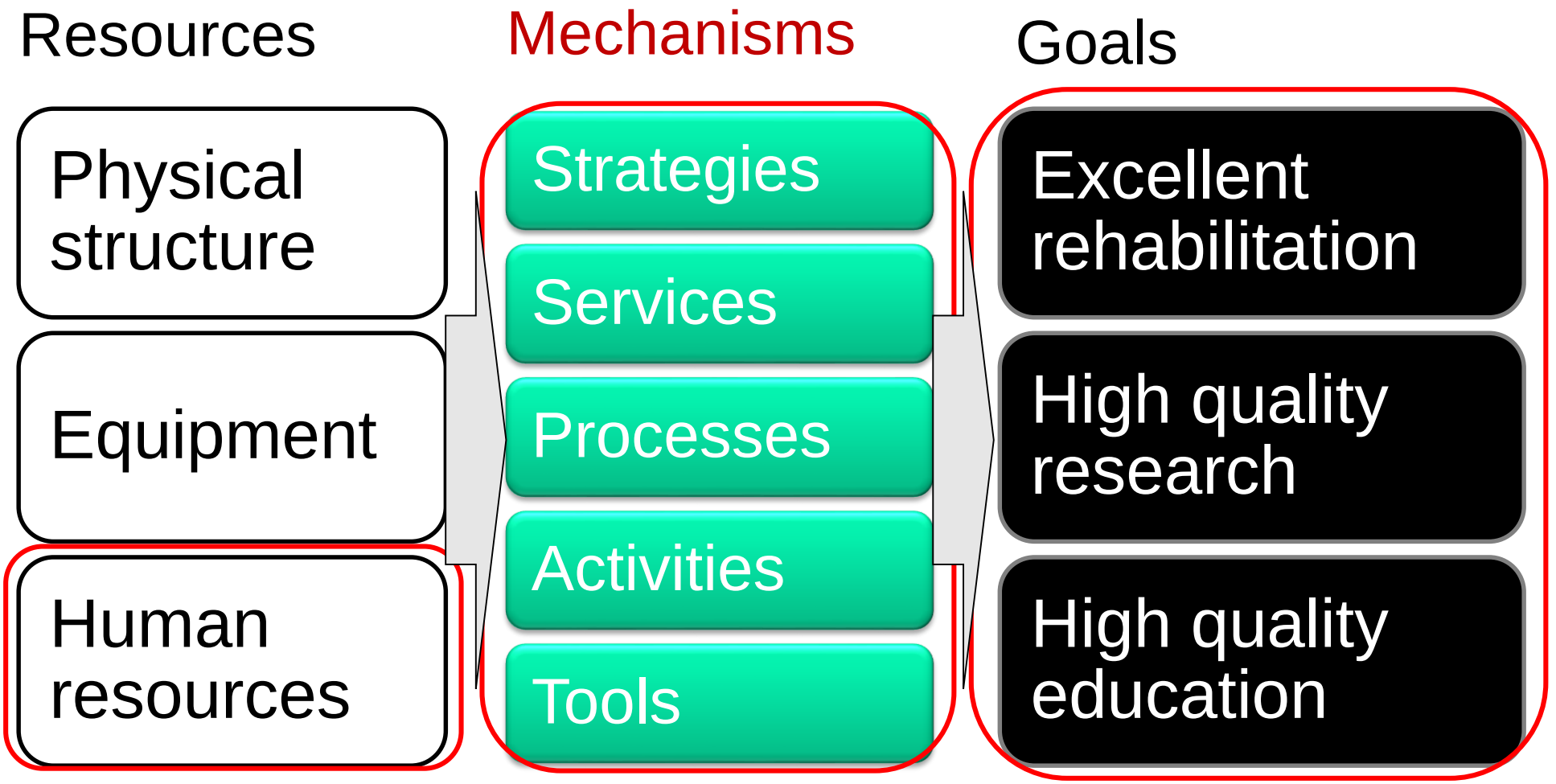


2009

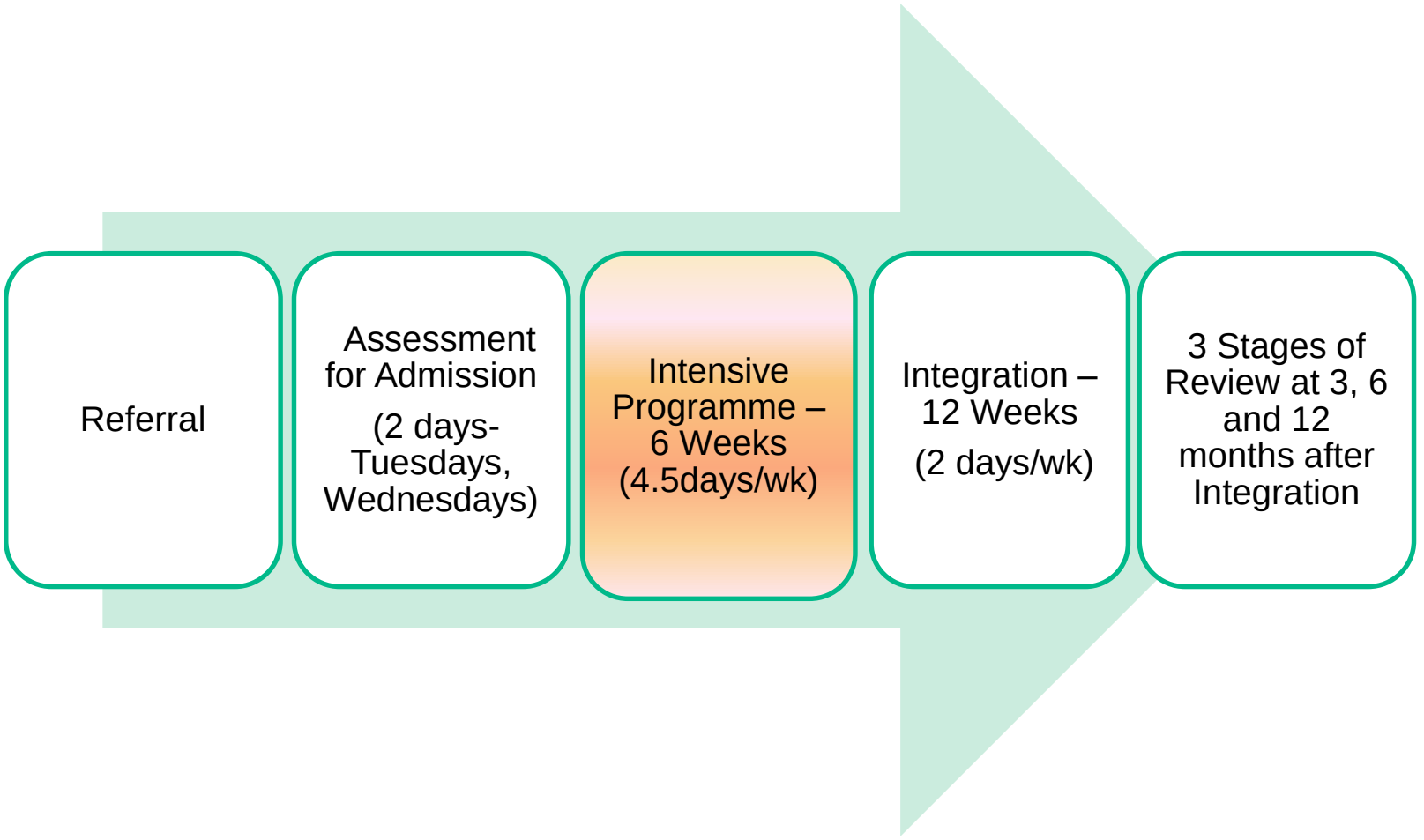


2014

Considering research into service design and delivery



Patient journey through service (now out of date)



THE HEALTHCARE DESIGN PROCESS: The role of modelling and simulation

Simulation as a solution?

What is 'design'?

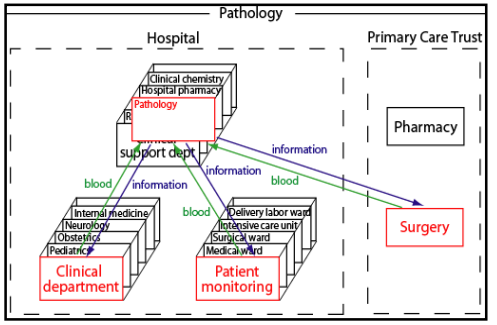
- ‘Design’ is a very widely used word:
  - used casually,
  - often aesthetic qualities.

- Design as a noun – “A plan or drawing produced to show the look and function of something before it is built or made”*

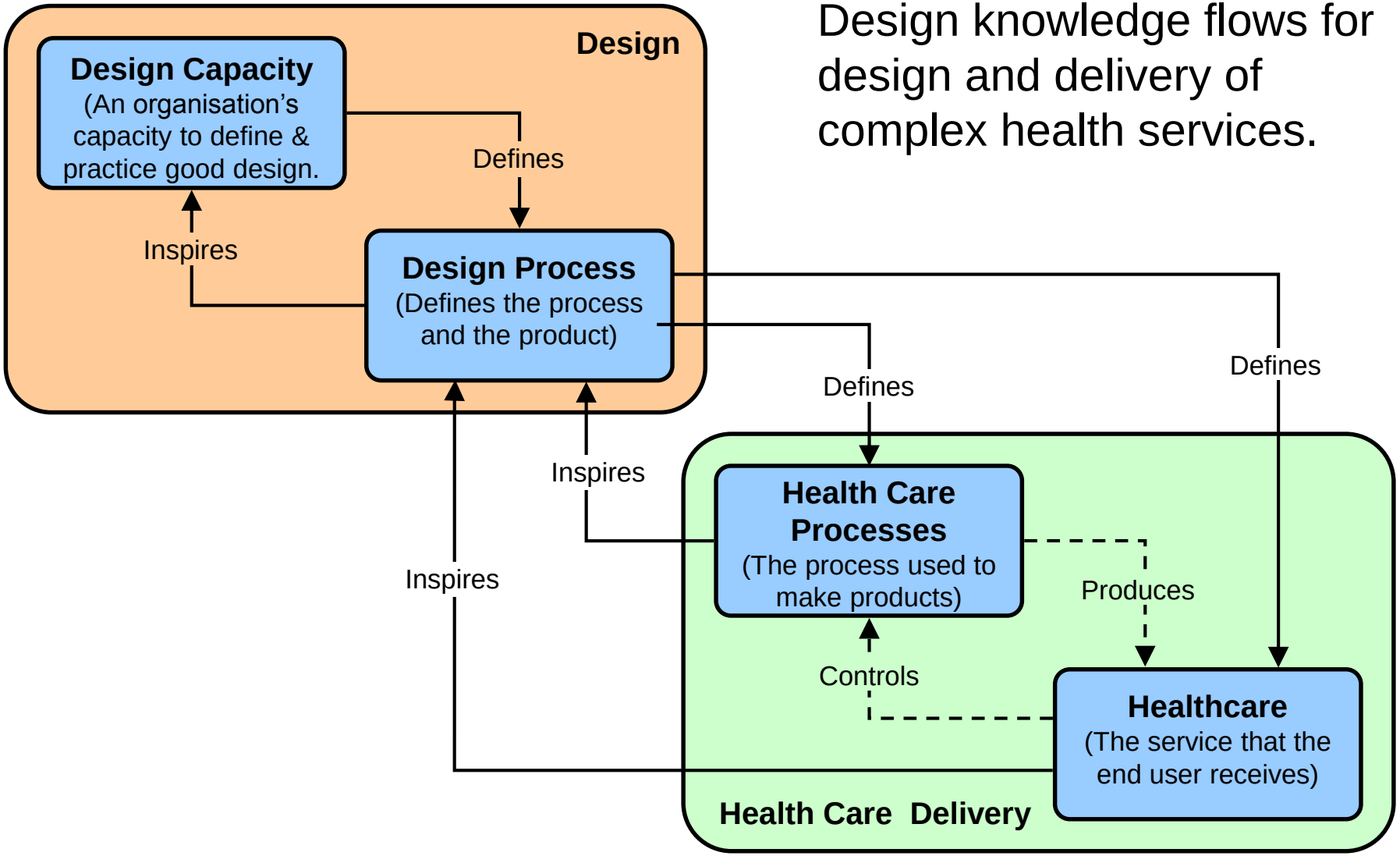
*Reference: Concise Oxford English Dictionary, Eleventh Edition, 2008.

What is 'design' (in practice)?

- In healthcare ‘design’ can be applied to:
  - Patient environment?
  - Innovative devices?
  - Look and feel?
  - Delivery processes (services)?
  - Architecture?
- No wrong answer.
- Service design



Conceptual approach

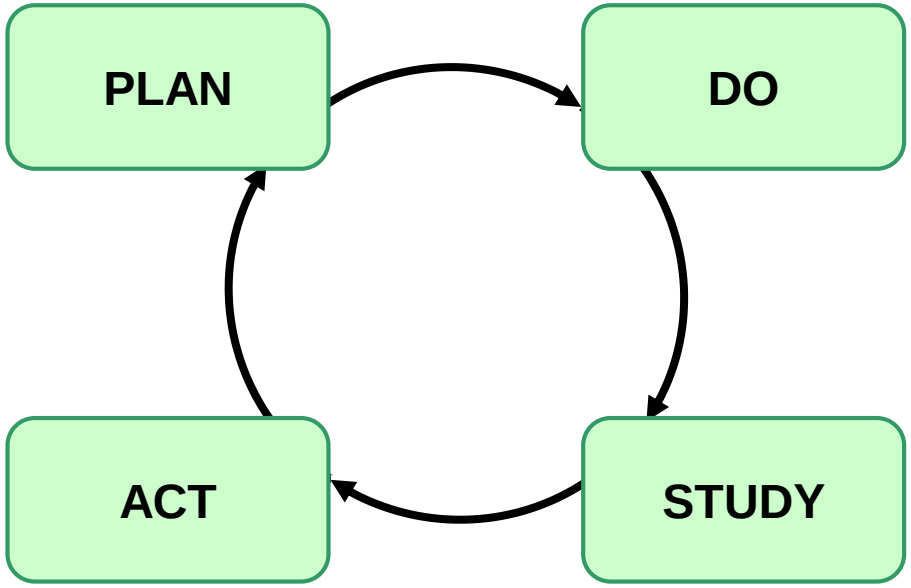


Design knowledge flows for design and delivery of complex health services.

*Eva-Maria Hempe, and Terry Dickerson, Engineering Design Centre, University of Cambridge

Healthcare Design (current practice)

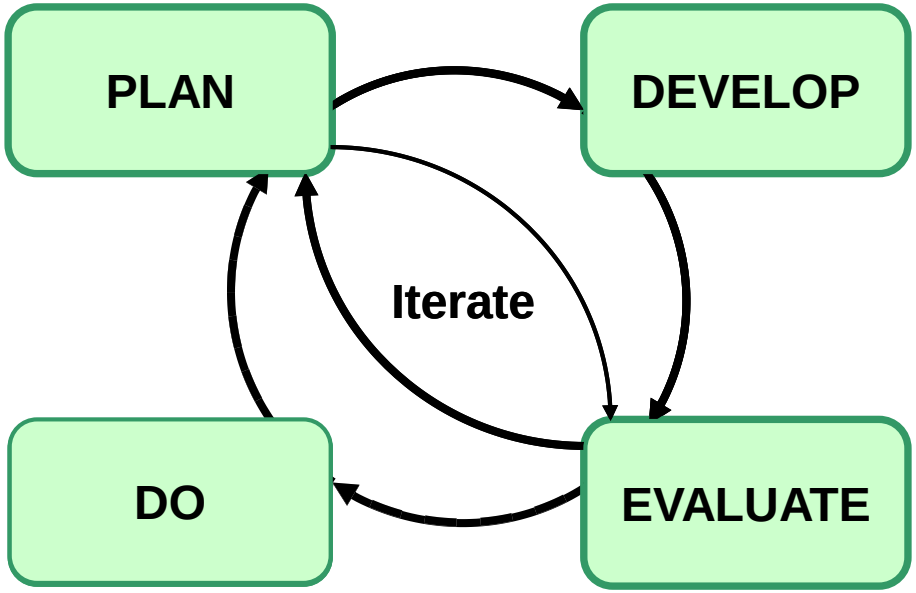
- Managing Service Development
  - Plan
  - Do
  - Study
  - Act
- Continuous development cycle.
- Difficult to document.
- Monitor risk after implementation.



Healthcare Design (current practice)

Healthcare Design (a future vision)

- Managing design as a process:
  - Plan
  - Develop
  - Evaluate
  - Do
- Manage risks before implementation – separate designing and doing.
- Must be right first time

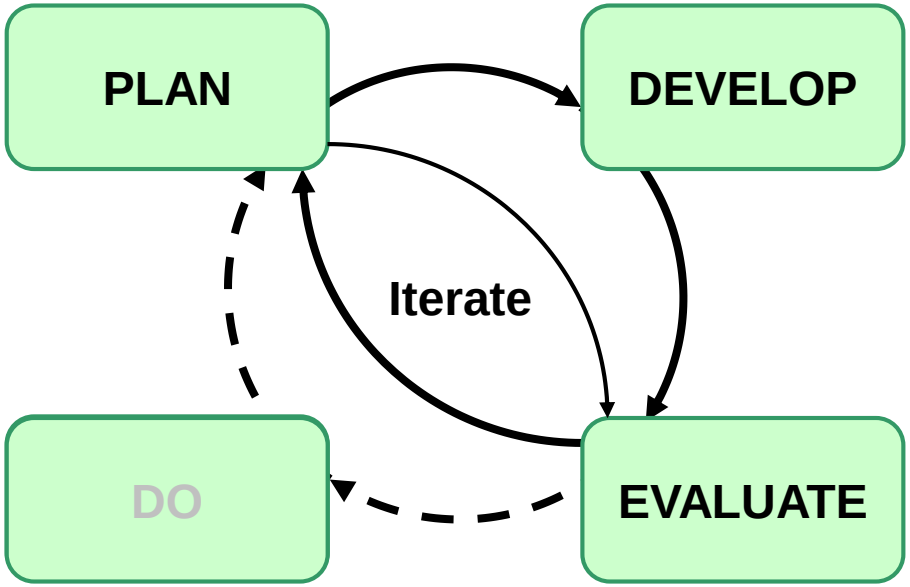


*Terry Dickerson, Engineering Design Centre, University of Cambridge

Healthcare Design (a future vision)

What is missing:

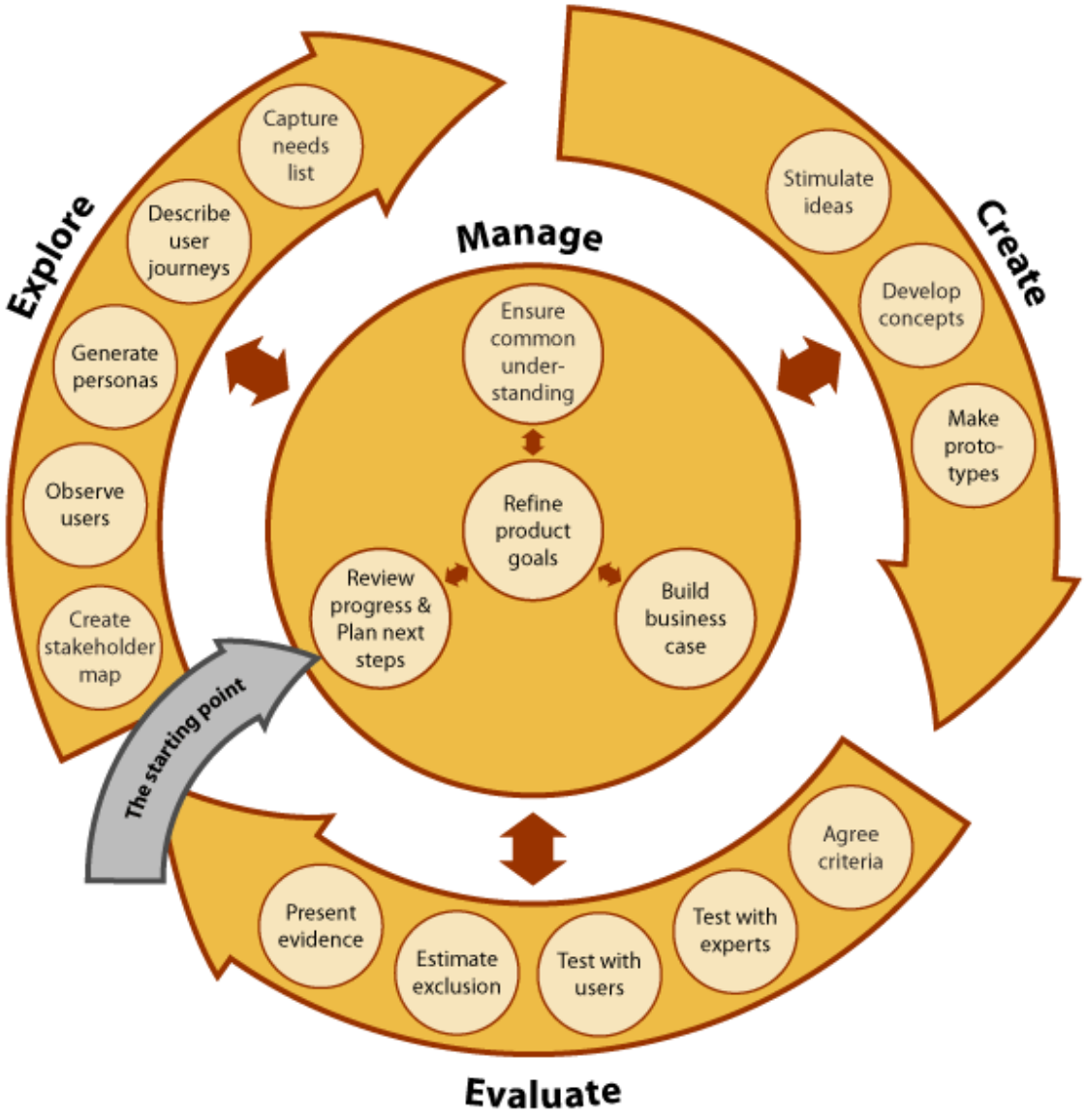
- Removing the ‘Do’ from the development during the design process – need to put something else in its place.
  - Virtual delivery processes
  - Process Mapping
  - Staff and User engagement
  - **Simulation**
  - Prospective risk analysis
- Management processes that value ‘design’



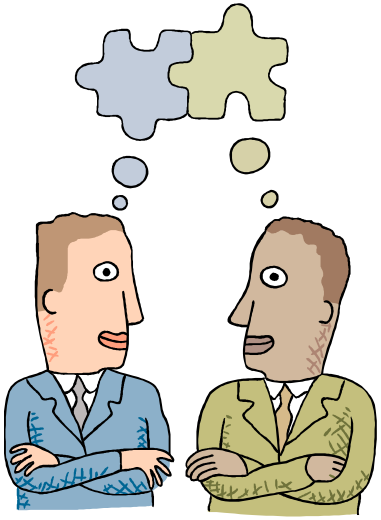
*Terry Dickerson, Engineering Design Centre, University of Cambridge

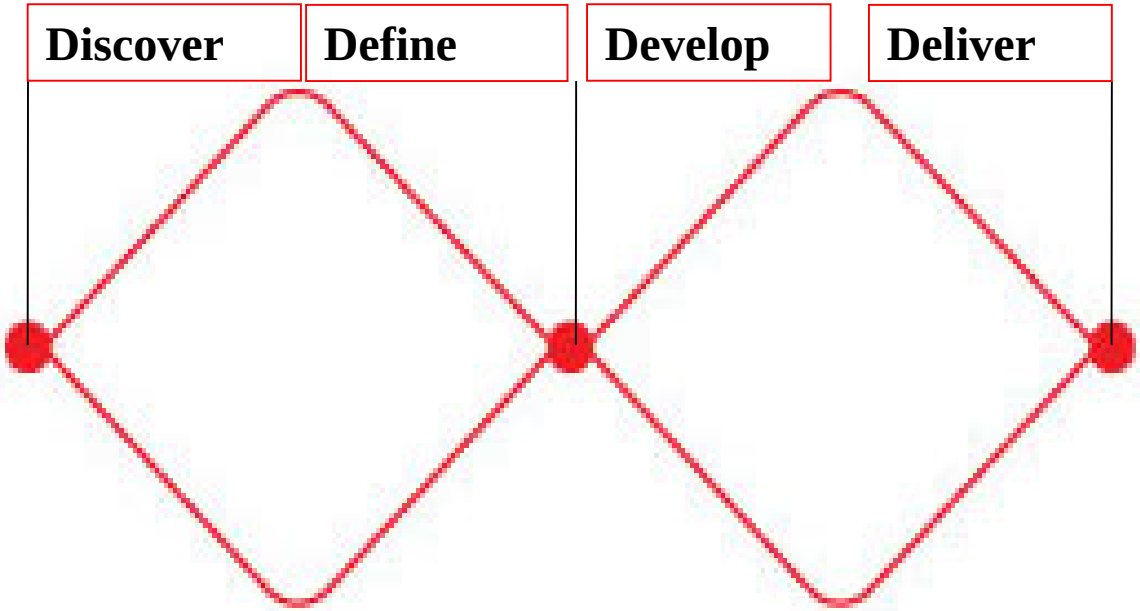
THE PROCESS
Focusing on scheduling

The Inclusive Design Process



Double Diamond Model at each stage





Are we missing something?

Are we misunderstanding something?

Design workshops

- Three sessions (two groups)
  - Introduction
  - Needs elicitation
  - Concept generation
  - Solution development

SESSION PROTOCOL

Session 1

1. Short description of the aim of the design sessions and the research (CM) — 5 min
2. **Survey** (CM) — 20 min
3. Explanation of the design process (AK) — 10 min
4. Explanation of sessions (CM) — 10 min
   a. Output
   b. Commitment
   c. Activity Outline
   d. Questions
5. Reflection Sheet (CM) — 10 min

Session 2

1. **Activity to elicit need** (CM) — 15 min
   a. Done in two groups
2. **Statement of need and requirements based on example** (AK) — 10 min
3. Comparison of Requirements — 5 min
   a. Put the requirements on a share board and asked whether anything has been missed (CM)
3. Ask each group to prioritise the requirements (CM) — 10 min
   a. Ask each group to determine the most important, the least important, 2nd most important, 2nd least important ect.
4. **Reflection sheet** (CM) — 10 min
   a. Ask each person to write down the next steps
   b. Give each person a copy of the requirements and ask them to annotate it with oth requirements found while working before the next session.

Session 3

1. Feedback (CM) — 5 min
   a. Ask whether new requirements have been found and put on board.
2. **Concept Generation Activity** (CM) — 20 min
3. Evaluate concepts with **requirements matrix** (AK) — 15 min
4. Choose concepts — 10 min
   a. Each group presents their concepts
   b. Each group chooses a concept from their own and a concept from other group
5. **Reflection sheet** (CM) — 10 min
   a. Ask what should happen next
   b. Ask them to articulate what they need to know about solutions based on our categories (viable, sustainable, usable, options)

Session 4

1. **Solution Activity** (CM) — 15 min
2. **Evaluation Strategy** (AK) — 15 min
3. Survey — 20 min

Example of a scheduling session: Tasks before scheduling

1

Whole team meets to discuss clients & their needs

2

Professional groups meet to workout needs (separately for OTs, Psych, SLTs)

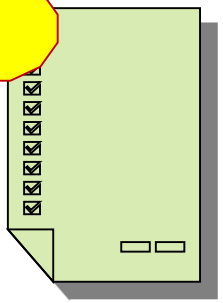
3

Collect Client Schedules

4

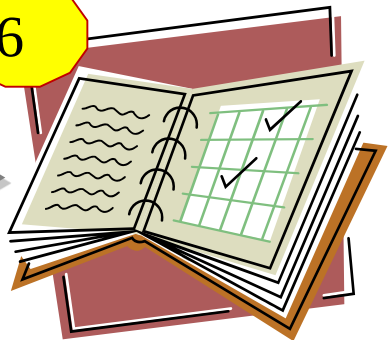
Each Staff Checks calendar for prior engagements

5



Each staff puts in request for whole of next intake

6



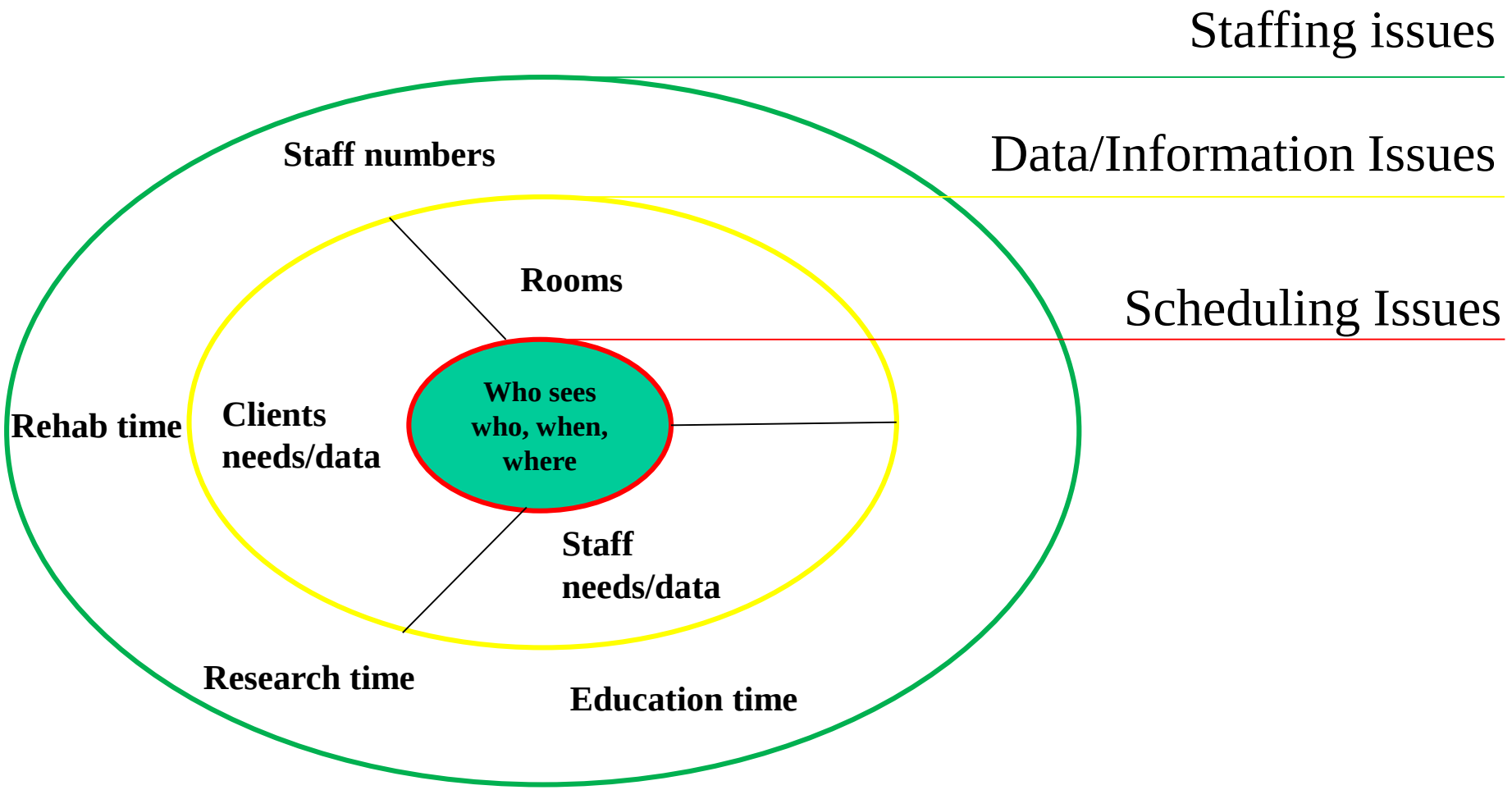
Collect Staff Schedules

7

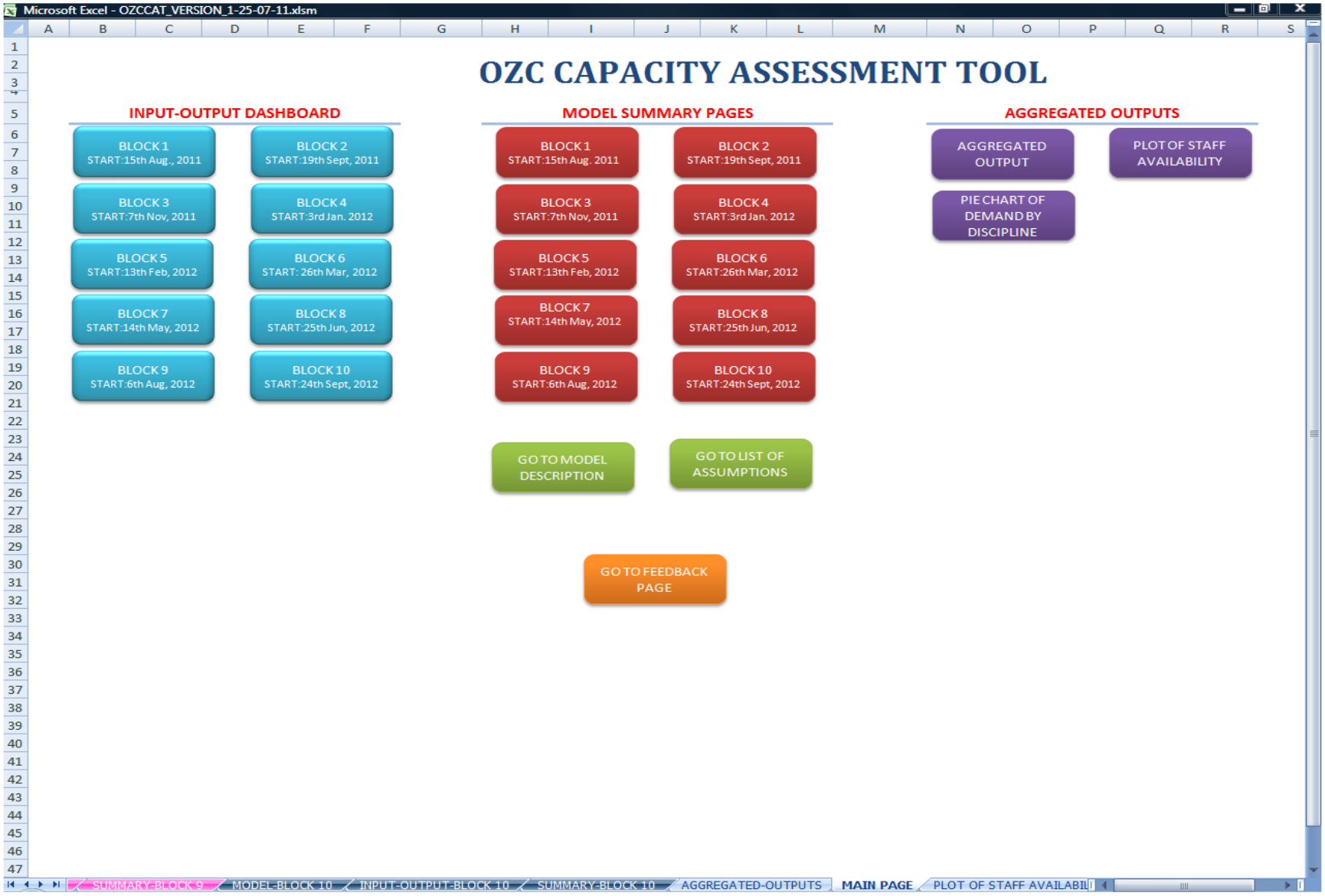
Seek volunteer staff to do TT (2-3)

OUTCOMES

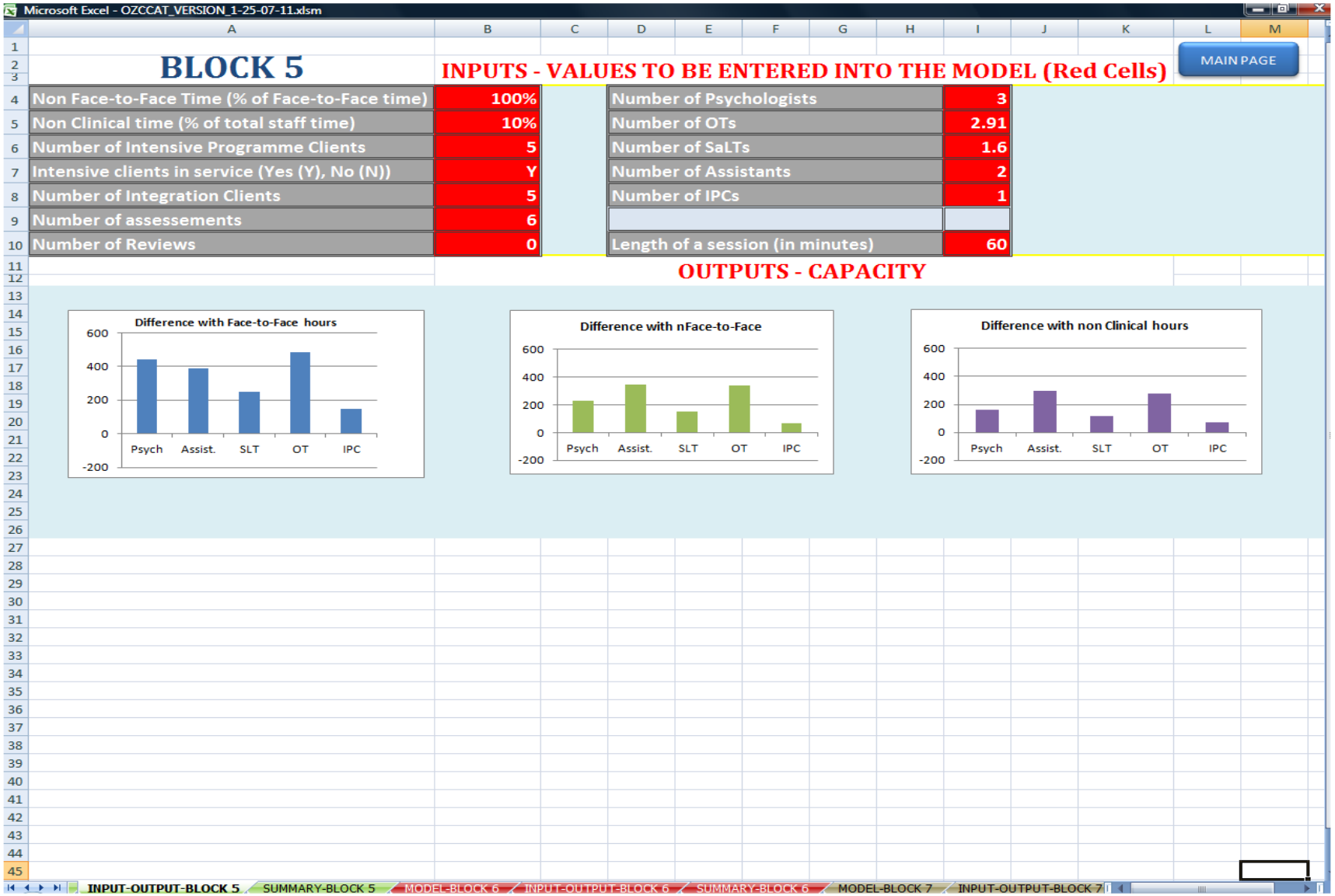
Problem re-stated



OZCCAT - Main page snapshot



OZCCAT - Dashboard snapshot



OBSERVATIONS AND NEW QUESTIONS

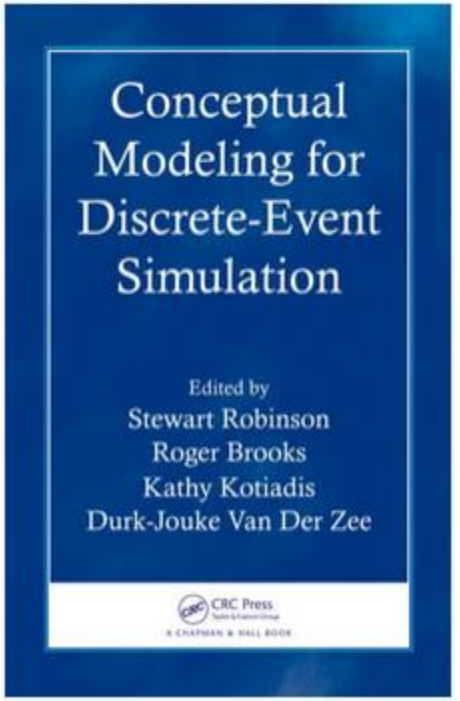
Observations

- Several new concepts emerged that were of interest to the group
  - Systems
  - Complexity
  - Unintended consequences
  - Disruptions
  - Conflicting goals
  - Models as scaffolding for metacognition

- Communication of systems concepts
  - The simplest the better
  - Pictures, pictures, pictures!

Questions

- How do we describe a healthcare system or process in the absence of simulations?
- There seems to be no unified answer to this question.
- *the state-of-the-art is such that we are not yet in the position to propose a unified definition of a conceptual model or a unified approach to conceptual modelling*
- What is the way forward?



Co-Design of an Integrated Diagrammatic Systems Modelling Language for healthcare

Current project.
Will be happy to discuss the idea

Thank you!