Developing a systems approach for healthcare improvement in LMIC

Professor John Clarkson FREng
How can we do it better?

What could possibly go wrong?
To work with the health and care professions to explore how engineers can add to current understanding and practice of systems engineering in quality improvement and healthcare design.
Systems Approach

“Systems that work do not just happen – they have to be planned, designed and built”

(Creating systems that work: Principles of engineering systems for the 21st century, Royal Academy of Engineering, 2007)

People

Design

Risk

Constraints

Specify design requirements need validate operate decommission.
People

Systems

Design

Risk
Systems
Systems

- Who are the stakeholders?
- What are the elements?
- How does the system perform?
Design

Need
Discover Define Develop Deliver
Problem
Solution
Design

- What are the needs?
- How can the needs be met?
- How well are the needs met?
Risk

- Threat
- Opportunity

accidents normal exceptional
Risk

- What is going on?
- What could go wrong? / What do we do well?
- How can we make it better?
People
People

- Who will use the system?
- Where is the system?
- What affects the system?
What is the problem?

Who will use the system?

Where is the system?

What affects the system?

Who should be involved?

Who are the stakeholders?

What are the needs?

What are the elements?

What does good look like?

What do we do well?

How does the system perform?

How well are the needs met?

How can the needs be met?

What could go wrong?
What is the problem?

How does the system perform?

Current Performance

Trigger

Measurably Better

Understand Design Deliver Sustain
Radical thinking:

- Engineers think about people
- Iteration before implementation
- Design is an exploratory process
- Risk management is a proactive process
- Thinking changes practice, process helps
- Common sense is not common
Engineering Better Care

How can we do it better?

What could possibly go wrong?
Strategic Outline Full

Programme of change

Measurably Better

Current Performance

Trigger Solution(s) End

Understand Design Deliver Sustain

Concept(s) Implementation

Understand Design Deliver Sustain

Case for change

Strategic Outline Full

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Challenges

- Language & construct
- Culture & context
- Politics & Power
Response

- Clinical focus of TBI
- Qualitative research
- Participatory approach
- Embedded researchers
- Local leadership
- Longstanding partnership
Delphi protocol can be applied when a community of experts is required to deliver a consensus answer.

Reference 1 - 0.24% Coverage:
an agreement among the experts about what the answer should be. This consensus reaching problem
has been already considered in the literature, though its automation remains as a challenge.

Reference 3 - 1.22% Coverage:
The Delphi Process in general is not rigid and its structure depends on the
situation. Looking for guidelines, this paper follows the steps and guidelines stated in [5]. The Delphi
approach has been applied for several areas for different uses. For
instance, Roth [37] used the Delphi approach for acquiring knowledge from multi-expertise. Recently,
Bryant [4] applied the Delphi method for estimating the risk factors of the territorial chemical spill. Hayos
method to reach consensus among professionals with interest in chronic pain among children and
adolescents. The automation of Delphi is considered first as a set of computers and
software assisting human experts in the process. In this line, literature mentions [38], which is an
on-line discussion system based on Delphi, and Tuneg [34], who presents a Delphi method with
computer assistance.

Reference 2: 0.18% Coverage:
Schema matching, the identification of data elements that have the same meaning, is a critical step to
ensure the success of database integration.

Reference 4: 0.05% Coverage:
The Delphi method is commonly used for future studies, and it utilizes experts, who are asked to evaluate
different statements or hypotheses about the future.
“If there’s mutual trust and a willingness on both sides to learn from each other, a readiness to adapt and a readiness to try new things then good work will happen”

Professor Sir Eldryd Parry - Founder of THET
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