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Beyond Adoption: A New Framework for Theorizing and Evaluating Nonadoption, Abandonment, and Challenges to the Scale-Up, Spread, and Sustainability of Health and Care Technologies (NASSS)

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With thanks to Professor Trish Greenhalgh and IRIHS team

Outline

- Failure and partial successes in technology-supported innovation programmes.
- The role of complexity and complex systems.
- How to think about non-adoption, abandonment, scale-up, spread and sustainability.

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Care.data is in chaos. It breaks my heart

Medical data has huge power to do good, but it presents risks too. When leaked, it cannot be unleaked. When lost, public trust cannot be easily regained

Ben Goldacre
The Guardian, Friday 28 February 201
Jump to comments (122)

When sharing private medical records is proposed, regulatory framework are not enough. Photograph:

I am embarrassed. Last week I wrote in sup
to collect and share the medical records of a
with massive caveats. The research opportu
already knew that the implementation was c
information, partly because the checks and
to data – and how – have not yet been devis

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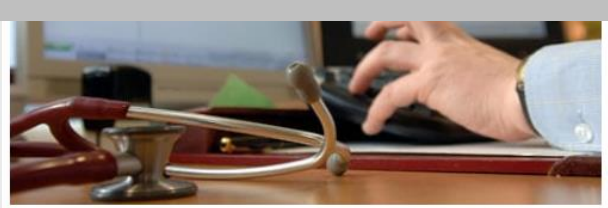
NHS

Abandoned NHS IT sys £10bn so far



▲ The public accounts committee found that new regional IT systems for the NHS are also being poorly managed. Photograph: Martin Godwin for the Guardian

An abandoned NHS patient record system has so far cost the taxpayer nearly £10bn, with the final bill for what would have been the world's largest civilian computer system likely to be several hundreds of millions of pounds higher, according a highly critical report from parliament's public spending watchdog.

NHS Digital "working through" healthcare IoT complexity

Neil Merrett
Published 07 February 2017

Beverly Bryant calls for discussions on complicated concerns around defining liability for prescribing sensor-led care amidst wider challenges in gaining patient trust on health data governance

IT'S TOO COMPLEX!!

ashion | Puzzle | Britain

s sold to insurers

ce purposes days after
les put on hold

Patient medical records in a NHS surgery Photo: Alamy

So what is complexity?

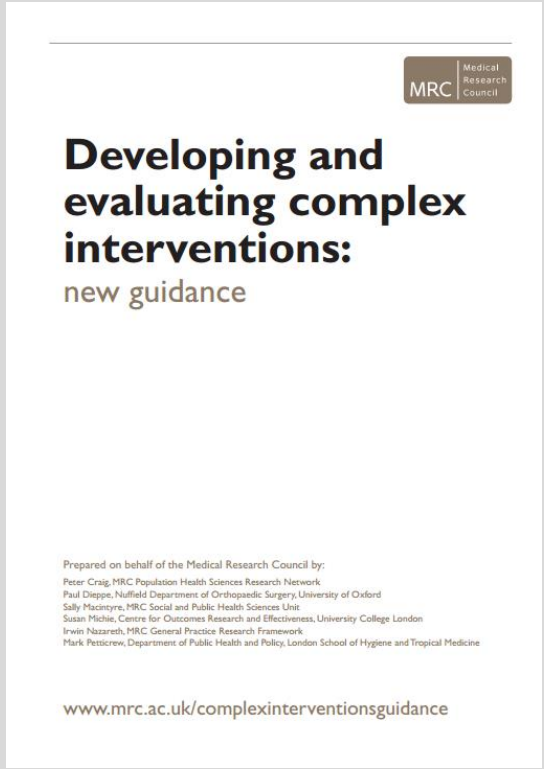
‘Things add up and they don’t. They flow in linear time and they don’t. And they exist within a single space and escape from it. That which is complex cannot be pinned down. To pin it down is to lose it.’

(Mol and Law, 2002, p. 20)

‘Complex’ interventions

- Number of interacting components within the experimental and control interventions.
- Number and difficulty of behaviours required by those delivering or receiving the intervention.
- Number of groups or organisational levels targeted by the intervention.
- Number and variability of outcomes.
- Degree of flexibility or tailoring of the intervention permitted.

(Craig et al 2008)



Am J Community Psychol (2009) 43:267–276
DOI 10.1007/s10464-009-9229-9

ORIGINAL PAPER

Theorising Interventions as Events in Systems

Penelope Hawe · Alan Shiell · Therese Riley

Intervention is an event in a [complex] system. Success is based on the extent to which dynamic properties of the system can be harnessed.

Simple: *Following a recipe*	*Complicated:* *Sending a rocket to the moon*	*Complex:* *Raising a child*
The recipe is essential	Formulae are critical and necessary	Formulae have a limited application
Recipes are tested to assure easy replication	Sending one rocket to the moon increases assurance that the next will be OK	Raising one child provides experience but no assurance of success with the next
No particular expertise is required but cooking expertise increases success rate	High levels of expertise in a variety of fields are necessary for success	Expertise can contribute but is neither necessary nor sufficient to assure success
Recipes produce standardized products	Rockets are similar in critical ways	Every child is unique and must be understood as an individual
The best recipes give good results every time	There is a high degree of certainty of outcome	Uncertainty of outcome remains
Optimistic approach to problem-solving	Optimistic approach to problem-solving	Optimistic approach to problem-solving

(Glouberman and Zimmerman 2002)

Complexity science

The challenge of complexity in health care

Paul E Plsek, Trisha Greenhalgh

BMJ 2001;323:625–8

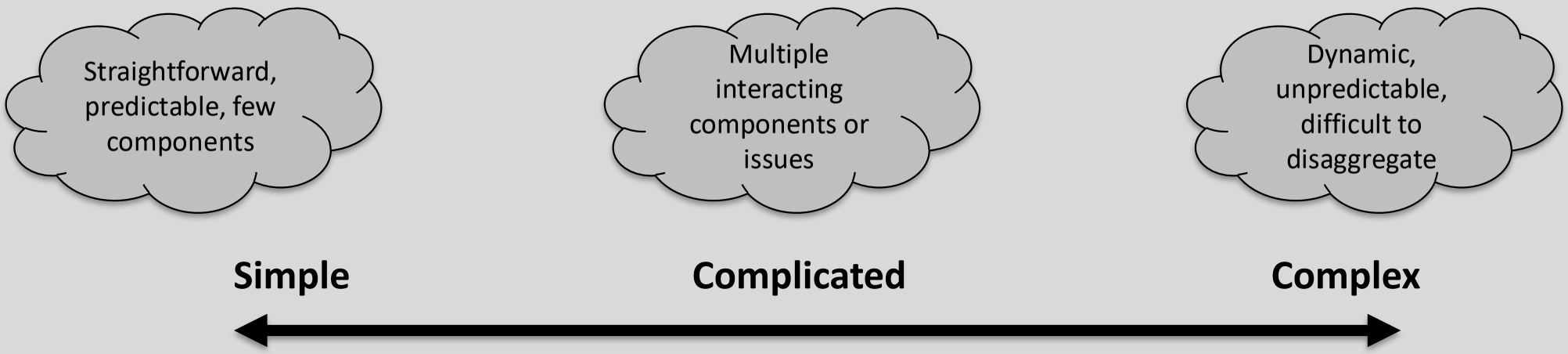
Summary points

The science of complex adaptive systems provides important concepts and tools for responding to the challenges of health care in the 21st century

Clinical practice, organisation, information management, research, education, and professional development are interdependent and built around multiple self adjusting and interacting systems

In complex systems, unpredictability and paradox are ever present, and some things will remain unknowable

New conceptual frameworks that incorporate a dynamic, emergent, creative, and intuitive view of the world must replace traditional "reduce and resolve" approaches to clinical care and service organisation



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JOURNAL OF MEDICAL INTERNET RESEARCH Greenhalgh et al

Original Paper

Beyond Adoption: A New Framework for Theorizing and Evaluating Nonadoption, Abandonment, and Challenges to the Scale-Up, Spread, and Sustainability of Health and Care Technologies

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Greenhalgh *et al. BMC Medicine* (2018) 16:66
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BMC Medicine

http://www.jmir.org/2017/11/e367/

RESEARCH ARTICLE Open Access

Analysing the role of complexity in explaining the fortunes of technology programmes: empirical application of the NASSS framework

Trisha Greenhalgh[1*], Joe Wherton[1], Chrysanthi Papoutsi[1], Jenni Lynch[2], Gemma Hughes[1], Christine A'Court[1], Sue Hinder[3], Rob Procter[4] and Sara Shaw[1]

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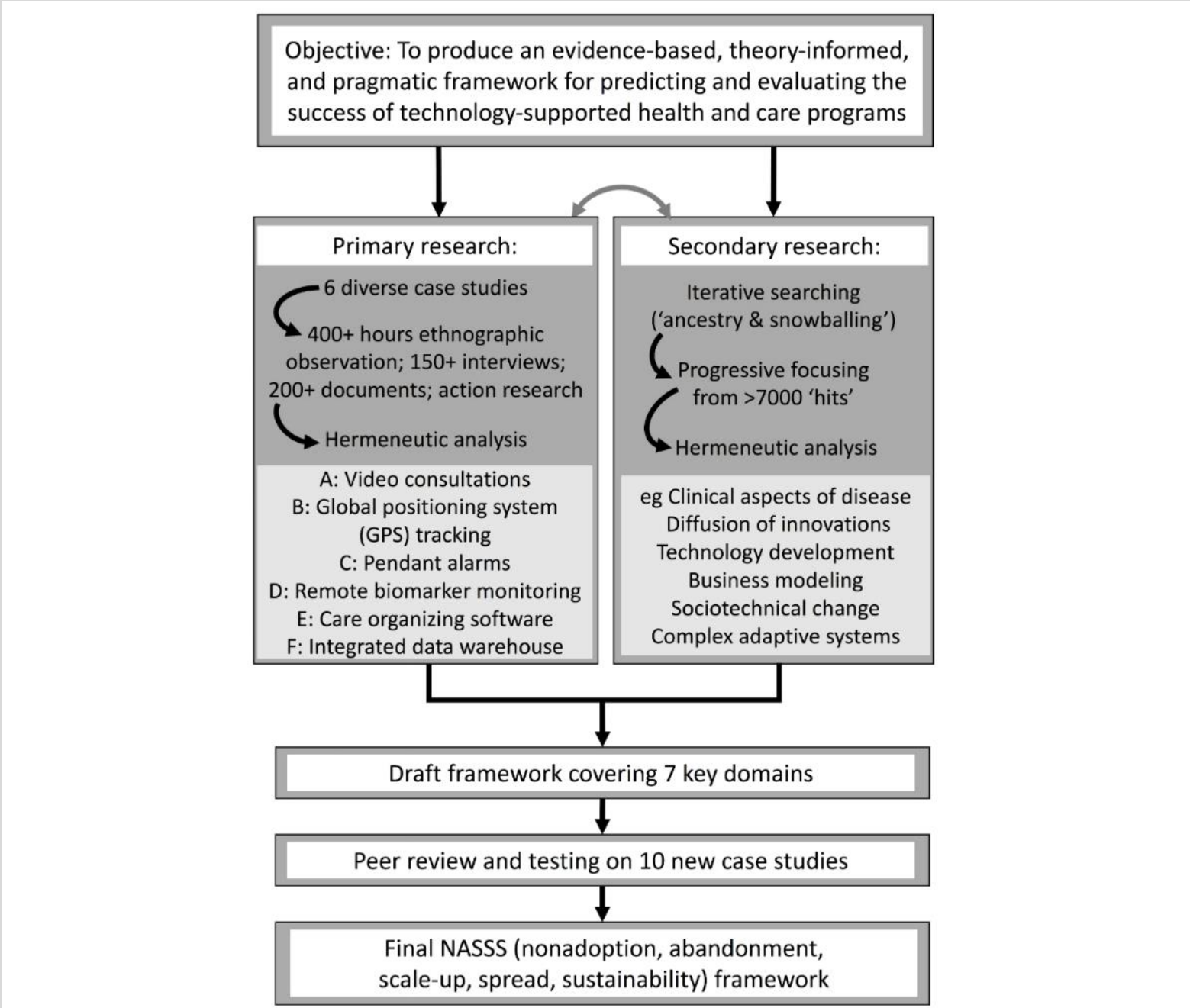
Objective: To produce an evidence-based, theory-informed, and pragmatic framework for predicting and evaluating the success of technology-supported health and care programs
Primary research:
6 diverse case studies
400+ hours ethnographic observation; 150+ interviews; 200+ documents; action research
Hermeneutic analysis
A: Video consultations
B: Global positioning system (GPS) tracking
C: Pendant alarms
D: Remote biomarker monitoring
E: Care organizing software
F: Integrated data warehouse
Secondary research:
Iterative searching ('ancestry & snowballing')
Progressive focusing from >7000 'hits'
Hermeneutic analysis
eg Clinical aspects of disease
Diffusion of innovations
Technology development
Business modeling
Sociotechnical change
Complex adaptive systems
Draft framework covering 7 key domains
Peer review and testing on 10 new case studies
Final NASSS (nonadoption, abandonment, scale-up, spread, sustainability) framework

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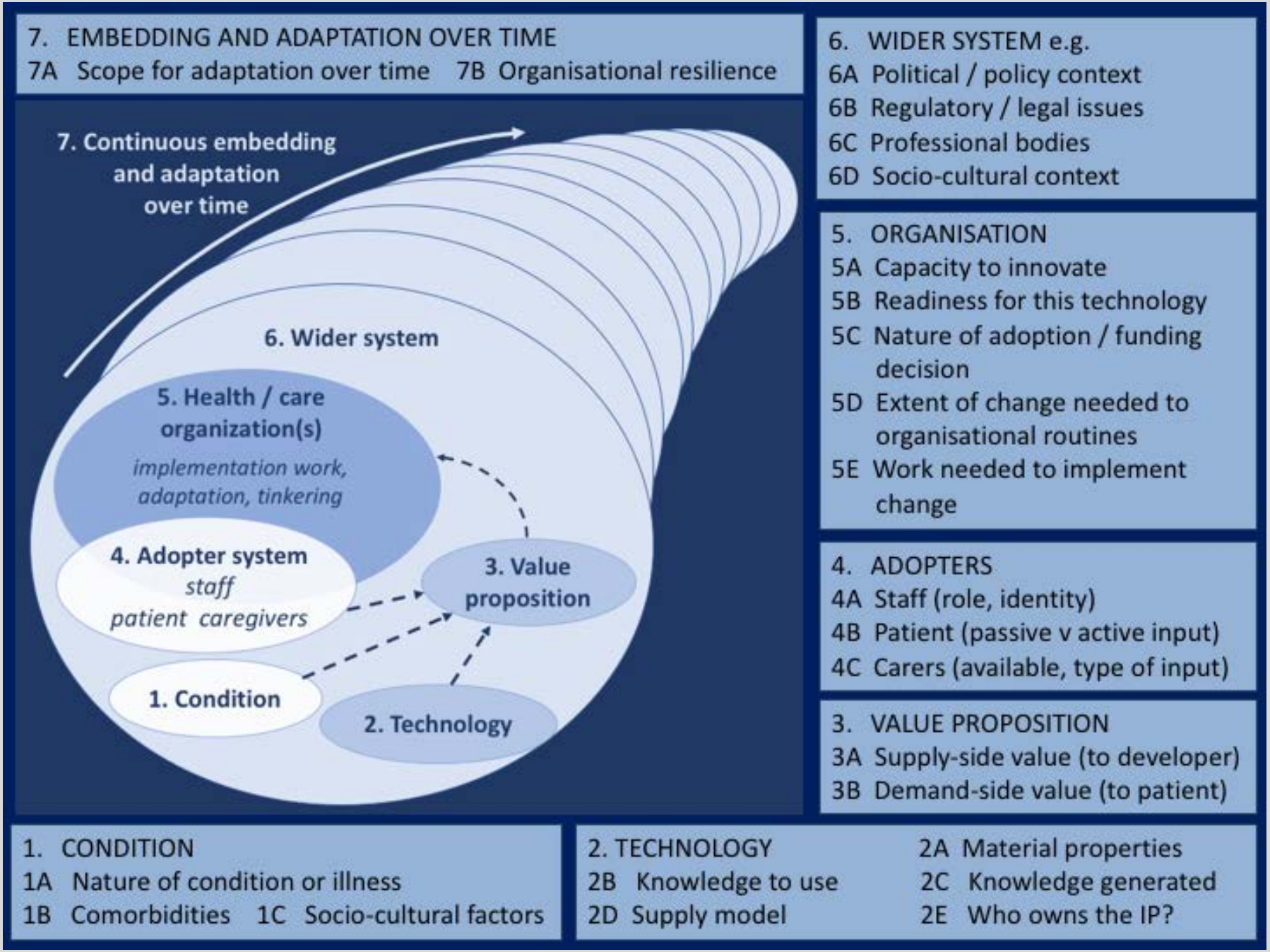

So what?

- Working with complexity

  '…we must abandon linear models, accept unpredictability, respect (and utilise) autonomy and creativity, and respond flexibly to emerging patterns and opportunities.' (Plsek and Greenhalgh 2001)
- Strong participatory element/increasing ownership
- Not just *whether* an intervention 'works' → also need to understand *how* and explain *why*
- Avoid reinventing the wheel
- Sustainability and transferability of change

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Thoughts and questions?