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SEIPS quick reference guide and work system explorer

Version 1, August 2022

Healthcare is a complex socio-technical system

Healthcare is complex because it is highly variable, uncertain, and dynamic.

Healthcare is a socio-technical system because it is characterised by multiple interactions between various components, both human and technological.:

What is SEIPS?

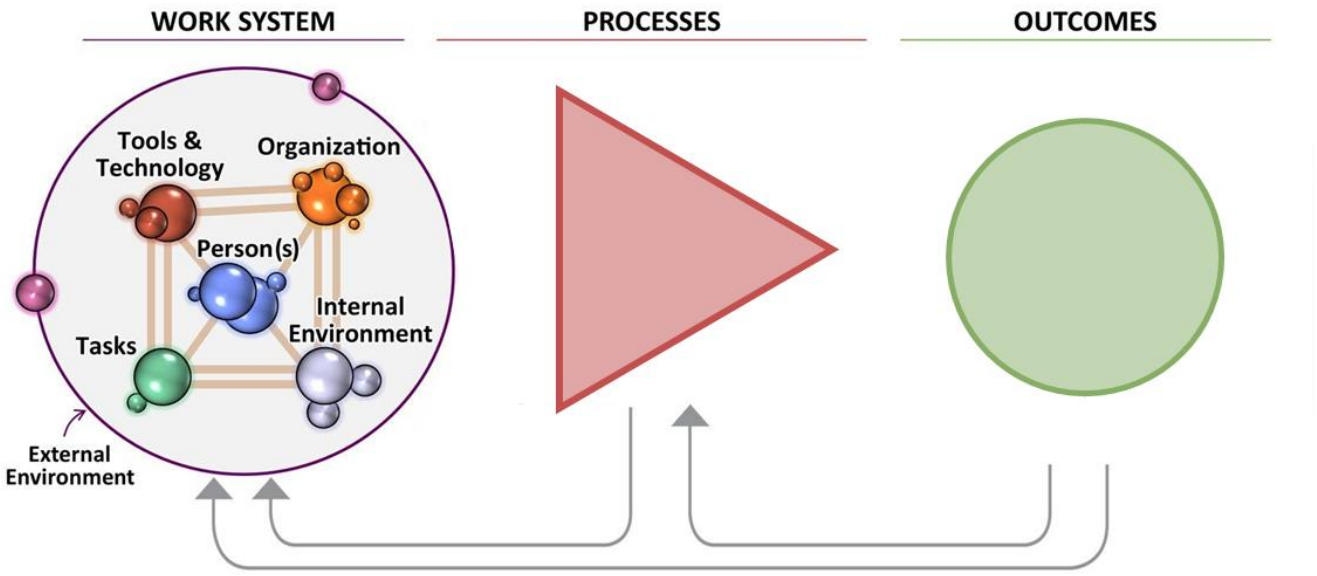
SEIPS is a framework for understanding outcomes within complex socio-technical systems.

Figure 1 provides an overview of the System Engineering Initiative for Patient Safety (SEIPS) framework, combining SEIPS 2.0[1] and SEIPS 101[2]. The figure It describes how a **work system** (or socio-technical system, left) can influence **processes** (work done, middle), which in turn shapes **outcomes** (right).

The SEIPS framework acknowledges that work systems and processes constantly adapt (see arrows in Figure 1).

[1] Holden, R.J., Carayon, P., Gurses, A.P., Hoonakker, P., Schoofs Hundt, A., Ozok, A.A. and Rivera-Rodriguez, A,J. (2013) SEIPS 2.0: a human factors framework for studying and improving the work of healthcare professionals and patients. Ergonomics, 56(11), 1669-1686.
[2] Holden, R.J., Carayon, P. (2021). SEIPS 101 and seven simple SEIPS tools. BMJ Quality & Safety, 0, 1-10

Figure 1. Overview of the SEIPS framework



What are the different parts of the work system?

A ‘work system’ consists of six broad elements: external environment, organisation, internal environment, tools and technology, tasks and person(s). Figure 2 provides a brief overview of the different elements and potential contributory factors to consider during a learning response.

People cannot be separated from the work system; their deliberate placement at the centre emphasises that design should support – not replace or compensate for – people.

Using SEIPS to learn from patient safety incidents

SEIPS can be used as a general problem-solving tool (eg to guide how we learn and improve following a patient safety incident, to conduct a horizon scan, and to inform system design).

Figure 3 (the work system explorer) provides questions to help explore different work system elements. Figure 4 provides a blank template; this is also available as a MS PowerPoint.

Patient safety incidents result from multiple interactions between work system factors. SEIPS prompts us to look for interactions rather than simple linear cause and effect relationships. When a learning response thoroughly examines the different work system components and their interactions safety actions can focus on wider system issues, not individuals.

Figure 2. Overview of the SEIPS work system

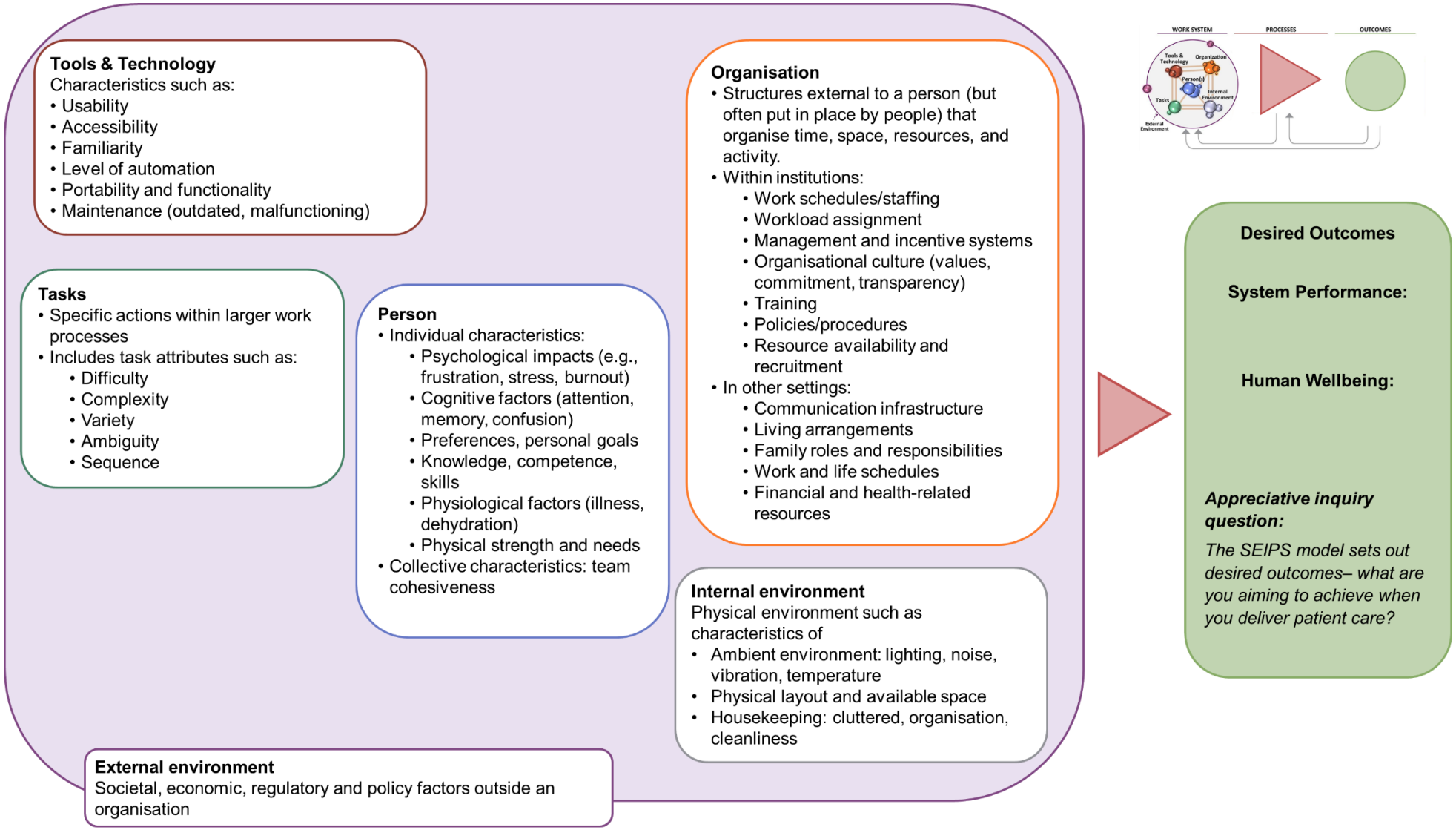


Figure 3. SEIPS work system explorer questions

Tools & Technology
- Describe the equipment/tools you use
- Describe the equipment design
- Share your insights into equipment availability and appropriateness
- Share your insights into equipment reliability
- Describe how information is presented (eg records/IT systems)
- Describe alarms and alerts
- Are any tasks automated?
- Describe where equipment is positioned. Is this optimal?
- Are tools/technology maintained and updated?
- Are manuals, procedures and supports accessible?

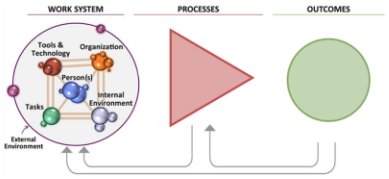
Organisation
- Tell me about how the patient pathways work
- Describe the information flow (how information is communicated)
- What is the communications workload like?
- Tell me how new information is flagged
- Where is new information held?
- Describe the leadership and supervision arrangements
- Describe how works is scheduled/allocated
- Describe staffing levels and resourcing
- Describe the safety/organisational culture
- Describe how change management works

Tasks
- Tell me about the task demands you face
- Describe the tasks which are complex or challenging to carry out
- Talk me through your experiences of the workload
- Are there time pressures? If yes please tell me more
- Does task repetition/monotony occur in this work system?
- Do you have to re-prioritise/reorganise?

Person
- Tell me about the patient mix
- Describe the team who deliver patient care
- Who else is part of the team (eg admin, domestic)?
- How familiar are team members with care processes/pathways?
- Are roles/responsibilities clearly defined?
- Describe how training is organised to support safe care
- Describe the team dynamics
- Describe the impact of personal factors (eg stress, morale, tiredness)

Internal environment
- Does the workspace support safe patient care/task performance?
- Share your thoughts on the layout of the environment
- Is the workspace appropriate for the task?
- Where are tasks completed?
- Describe any distractions you experience regularly
- Do interruptions impact patient care/task performance? If yes, how?
- Describe the impact of the ambient environment (eg lighting, noise, air quality)

External environment
- Describe any relevant national targets
- Tell me how the following impacts (if at all):
  - Policy and regulatory demands
  - Accreditation standards
  - Political decision making
  - Global events



Desired Outcomes

System Performance:

Human Wellbeing:

Appreciative inquiry question:

The SEIPS model sets out desired outcomes– what are you aiming to achieve when you deliver patient care?

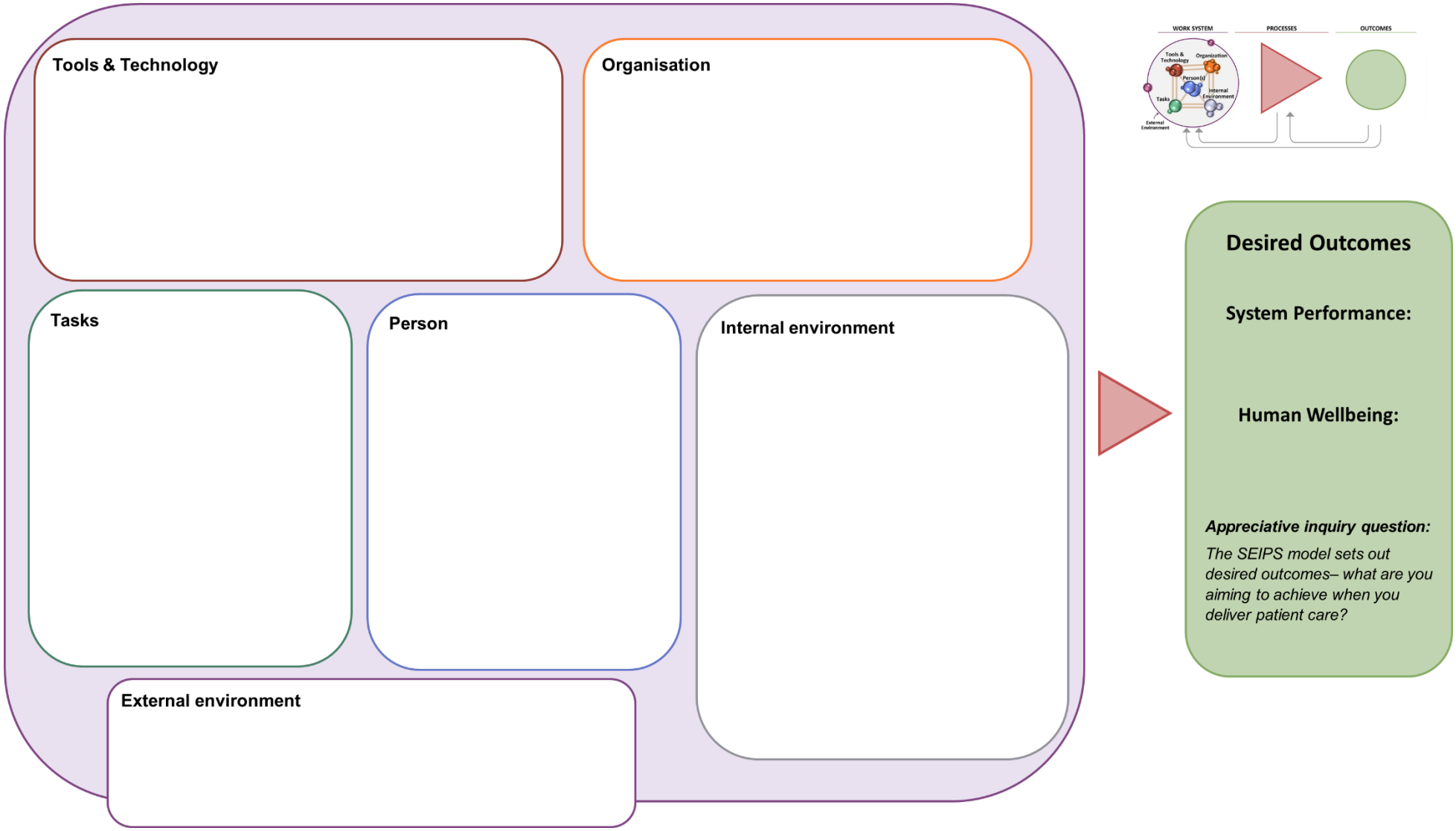



Figure 4. SEIPS work system template