

Sociotechnical futures

How stakeholders envision the use, reconfiguration and evolution of healthcare through digitization

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Objectives

To illustrate how future visions influence current actions by exploring the effects of imagined future sociotechnical systems on contemporary social practices.

To provide a comprehensive analysis of the potential impacts of digitization on sociotechnical systems within the healthcare sector.

To advocate for the necessity of an anticipatory anthropology in understanding and shaping future sociotechnical landscapes.

Futures and temporality: two accounts

First account: Gell's study of temporal cognition:

- unveils a pivotal triangular connection among **perception** (input), **memory** (schema recall), and **anticipation** (foresight, projection) (Gell, 1992).

Within this interstice lies **the convergence of future imaginings and past mappings into perception** – a space we recognize as the present, where perception unfolds.

The **present acts as the focal point, the vital vertex** in this triangle, where the amalgamation of past and future coalesce into the actionable facets of social life. The simultaneous existence of diverse temporal dimensions gives rise to a dense and intricate multitemporal configuration known as *heterochrony* (Ssorin-Chaikov, 2006).

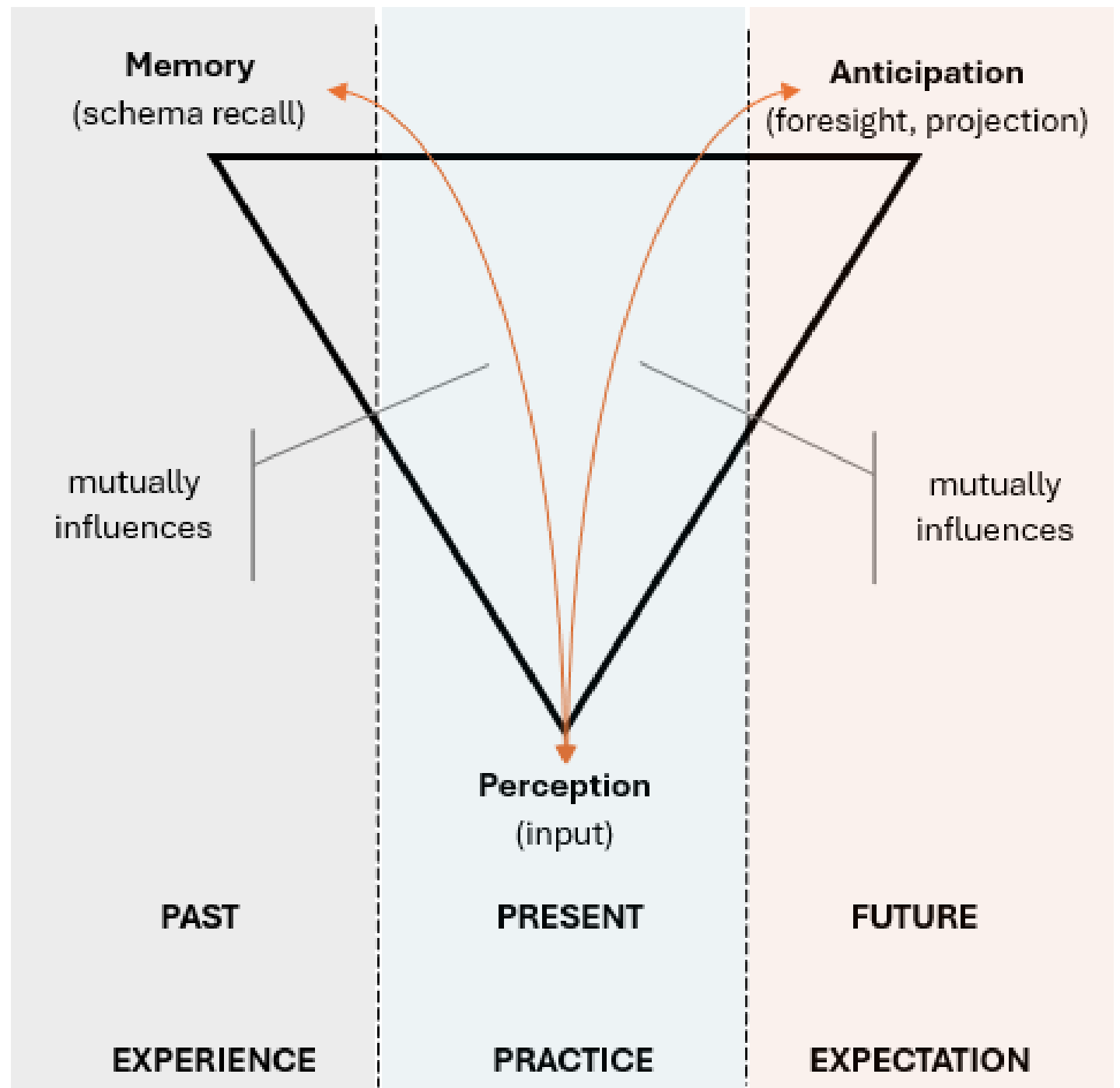
Futures and temporality: second account

Second account: Koselleck's philosophy of historical time:

- stresses that **the interaction between "experience" and "expectation" constitutes an inseparable conceptual structure, in which one pole depends on the other** (Koselleck, 2004).

Experience unfolds within a defined space, while expectation extends toward a horizon. This metaphorical horizon signifies that **our perceptions are limited by our past experiences**, shaping our expectations for the future, keeping it open. Consequently, **any conception of the future is inherently influenced by our current understanding, leaving room for error and ineffability**, as the appropriate vocabulary is not fully created, making it impossible to fully define possible scenarios.

The social reality's multitemporal structure



The proposal: to address the present concretizations of imagined futures

To explore the impact of envisaged sociotechnical futures on present behaviours by displaying perspectives and firsthand accounts illustrating how the future influences the present, drawing from 12 interviews with agents involved in implementing digital health initiatives in Portugal.

Digital health designing as futures in present

- The designers -

One of the most pivotal domains for exploring the future in the present is sociotechnical innovation.

Policy entrepreneurs: the Portuguese political subsystem responsible for shaping the digital transformation in healthcare:

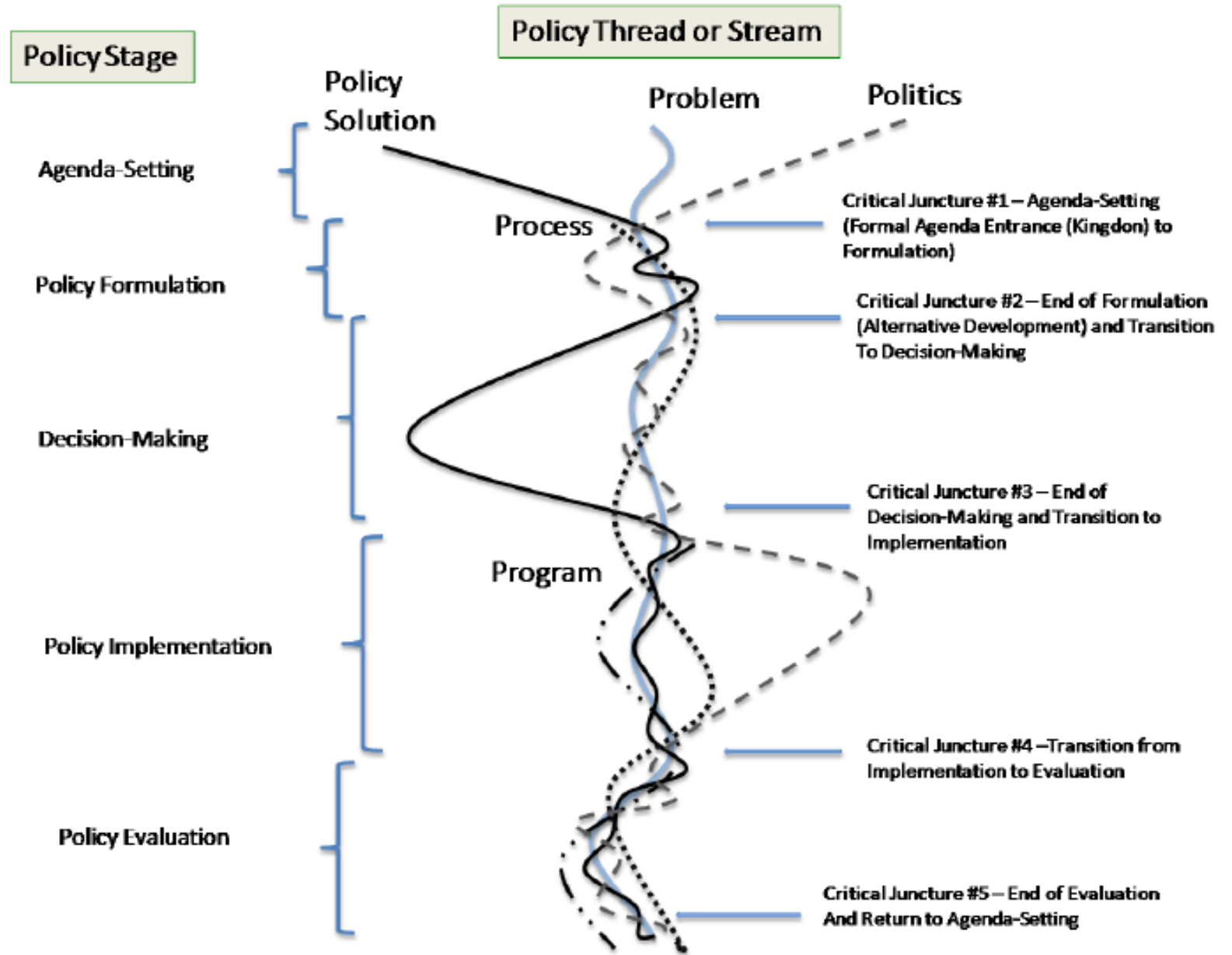
- **advocacy coalitions**, including politicians and technology developers;
- **epistemic communities**, consisting of researchers and philosophers;
- **instrumental constituencies**, a relatively new group representing healthcare service users.

These individuals encompass expertise from diverse scientific and non-scientific domains such as logistics, information systems, medical practitioners, business leaders, politicians, and various societal actors.

I opted to present actors' diverse visions of the future **without compartmentalising** them based on functional ontology.

Throughout the design process, stakeholders' perspectives and inclinations are articulated, deliberated upon, and eventually synthesised into a discourse coalition. This coalition gradually evolves into a proposed framework for policy-making, integrating perspectives from all stakeholders involved (see Howlett et al., 2015; Mukherjee & Howlett, 2015).

Five policy process
“streams” performed by
policy entrepreneurs
(cf. Mukherjee & Howlett, 2015)



Digital health designing as futures in present

- The design -

In line with the ideas outlined earlier, I postulate that **the anticipated impacts of implementing digital health are distributed across two intertwined dimensions: experiences and expectations.**

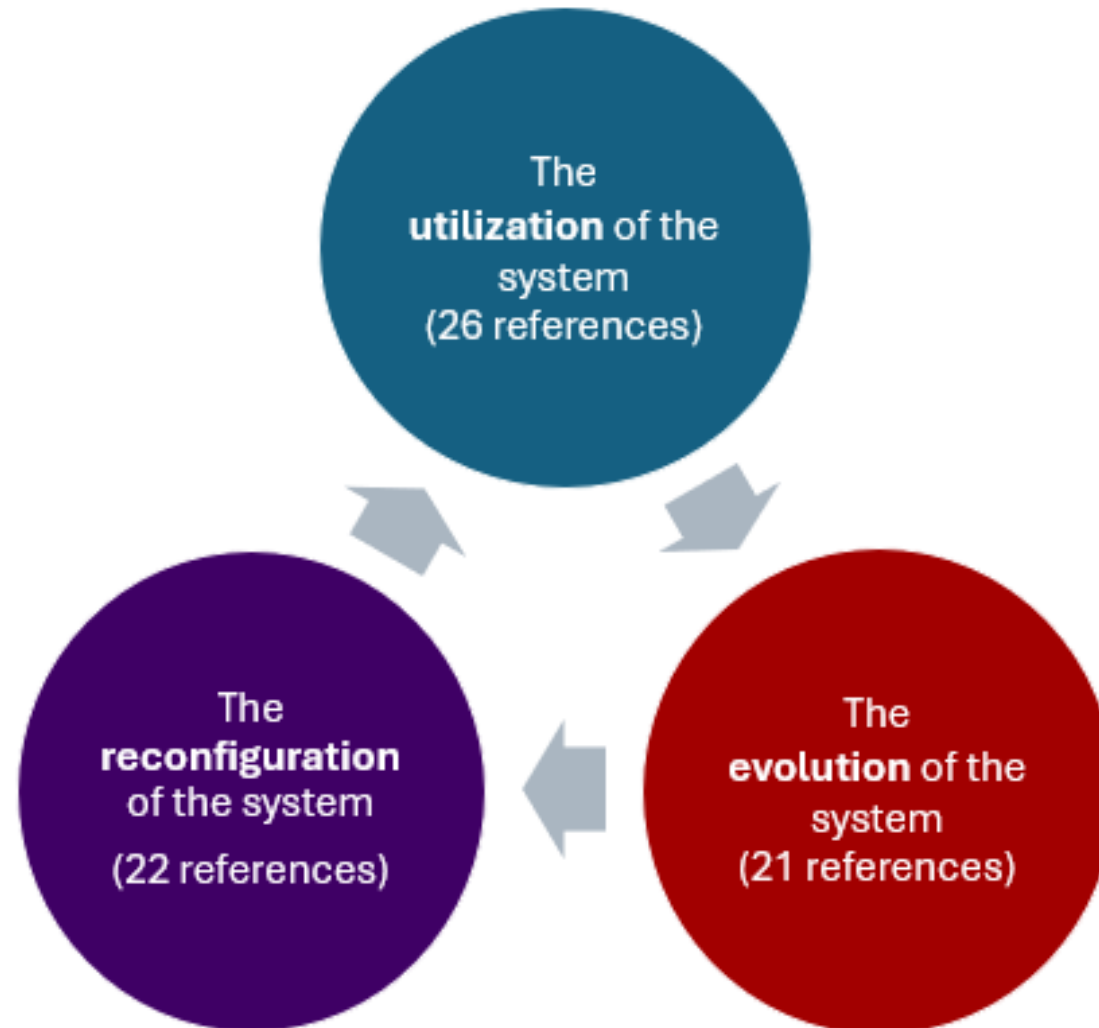
Two hypotheses

The current design of the digital health system will illuminate the realm of experiential spaces, addressing contingencies such as available resources, structural constraints, and other practical considerations.

Certain expectations horizons will emerge, unveiling the realm of the imaginative, encompassing new needs, desired futures, and other aspirational elements.

Digital health designing as futures in present

- The concerns -



The utilization of healthcare in the future

Categories	Subcategories	Indicators
Utilization (26 references)	Access (16 references)	• Change in the relationship between citizens and healthcare services (participation; monitoring; prevention; early detection; well-being; quality of life) • Adoption of technologies (cultural change; habit change) • Citizen-centred care • Reduction of geographical constraints (telehealth; telemedicine)
	Capacitation (7 references)	• Democratization of access • Validation of information • General literacy • Digital literacy (of citizens and healthcare professionals) • Comprehensive health education
	Inequality (3 references)	• Info-exclusion • Social exclusion • Geography

- The participants expressed significant concern regarding **access** to healthcare, particularly focusing on the **evolving relationship** between citizens and healthcare services.
- These changes encompass active **user involvement** in various aspects, such as **participating** in healthcare policies, actively **engaging** in monitoring, preventing, and early detection of health conditions, and emphasizing concerns about **well-being** and overall **quality of life**.

The healthcare system reconfiguration

Categories	Subcategories	Indicators
Reconfiguration (22 references)	Management and governance (11 references)	• Regulation (certification; co-payment; smart public procurement) • Data economy • Healthcare unit management (optimization of management processes; resource allocation) • Company management (new production methods; inclusion of other specialists)
	Inventiveness (7 references)	• Technological advancement (invention; innovation) • Technological employment (human resources)
	New medicine (4 references)	• Personalization • Humanization • Medical Profession (training; hybridism)

- Digital health implementation initiatives necessitate **collaborative** efforts within consortia arrangements.
- **Co-creation** serves as a pivotal strategy to foster discourse coalitions focused on needs assessment, technological advancements, and policy formulation.
- Throughout this process, several crucial steps are undertaken, including **technological validation, conceptualization, proof of concept, and preparation for certification.**
- **Consortia** play a paramount role by facilitating idea sharing and fostering **active participation.**
- Collaborative creation emerges as a key approach through which digital health fosters **novel modes of knowledge production** and explores **future scenarios.**

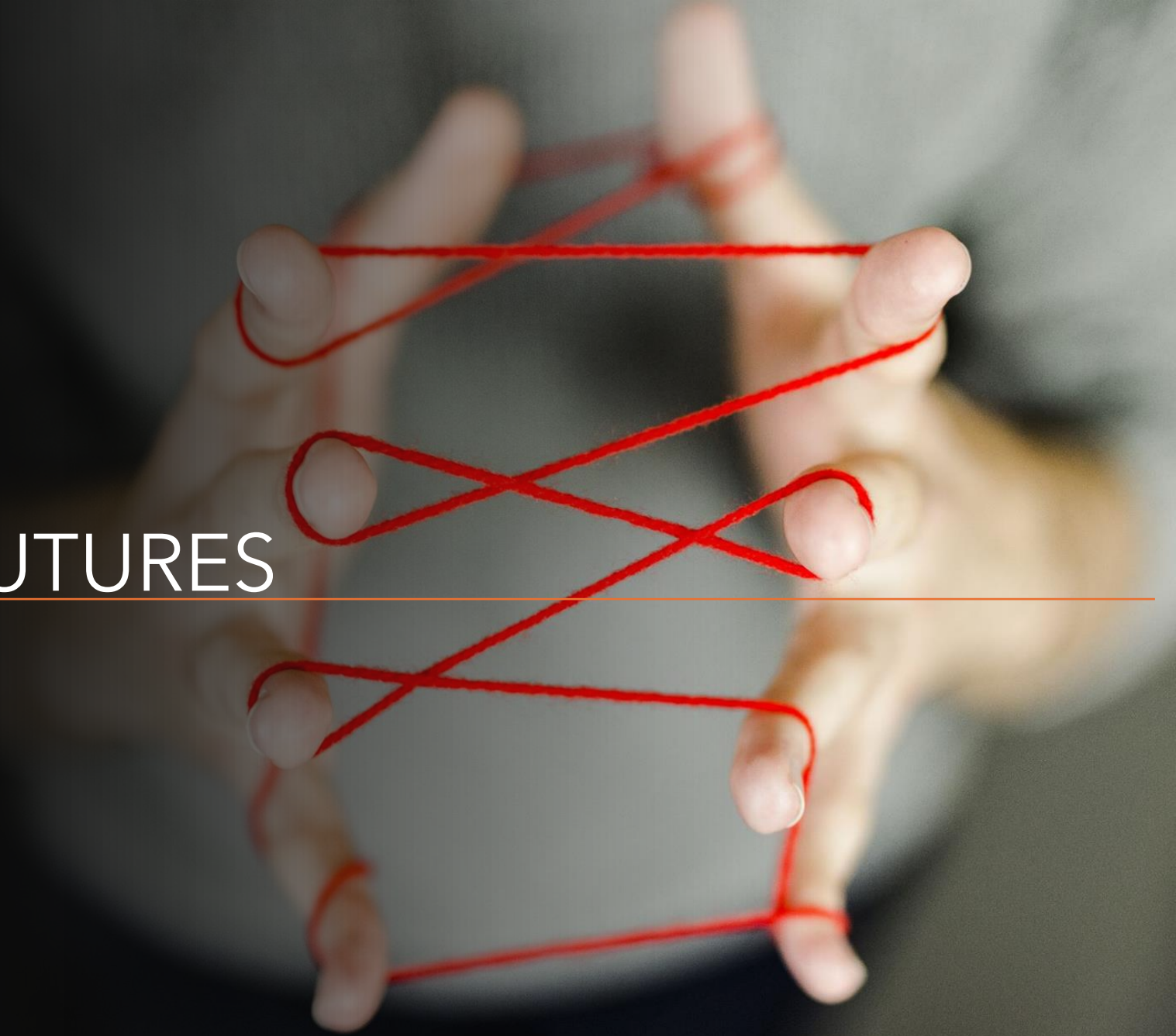
The health care evolution

Categories	Subcategories	Indicators
Evolution (21 references)	Social innovation (8 references)	• Participation • Intergenerational dialogue • Active aging • Age-Friendly Environments • Responsibilisation
	New collaborative arrangements (7 references)	• Co-creation • Multidisciplinarity • Consortia
	Biocommunicability (6 references)	• Technical interoperability (data infrastructure) • Social interoperability (service integration; interaction between stakeholders) • One Health • Cultural diversity

- Access to healthcare and the reconfiguration of healthcare systems represent **fundamental shifts** in the evolution of healthcare, both as a practice and a concept.
- Central to this transformation is the overarching theme of **innovation**.
- Within this ethos, **social innovation** emerges as a crucial component, highlighting the emphasis on **active participation**.
- **Knowledge dissemination** will play a pivotal role, transitioning from confined corporate and collegial environments to permeate through **society as a whole**.

SOCIOTECHNICAL FUTURES

SOME CONSIDERATIONS



About health care utilization

- **Healthcare engagement is evolving:** the shift in healthcare encompasses active user involvement in various aspects such as policymaking, monitoring, prevention, and emphasis on overall well-being and quality of life.
- **Recognition that culture influences digital health:** digital health landscapes are shaped by cultural nuances, including demographics, access to technology, and digital competencies affecting diverse health-related aspects.
- **Digital Health seen as a social equalizer:** digitalization in healthcare contributes to mitigate structural and geographical disparities, addressing concerns of inclusivity, democratization, and providing access to various population groups.
- **Digital health fosters empowerment and education:** the adoption and success of digital healthcare hinge on education and empowerment of both professionals and patients, emphasizing a shift toward a scientific culture and skill development in questioning and understanding digital health tools.

About health care reconfiguration

- **Digital healthcare systems promote collaborative efforts and consortia:** Co-creation serves as a vital strategy fostering discourse coalitions around needs assessment, technological advancements, and policy formulation.
- **State shall intervene in health innovation co-payment:** the State's involvement in health innovation co-payment is crucial for encouraging innovation and technology adoption.
- **An infrastructure for data systems interoperability and biometric data circulation shall consolidate.** the implementation of submarine cable networks is essential for a data economy, but it also introduces data geopolitics due to varied data regulations worldwide.
- **There will be biometric data collection and commercialization:** the need for mechanisms to collect, store, and regulate biometric data emerges as a requirement for biomedical research and therapy development.
- **Healthcare Unit Management will be optimized:** digital health adoption optimizes management processes in healthcare units, transitioning to a value-based healthcare management model.
- **There will be challenges in policy implementation and innovation:** the integration of patient-centred visions demands a shift from traditional management approaches to Agile methodologies. Responsible Research and Innovation (RRI) integrating social sciences into the innovation process face obstacles related to legislation, frameworks, and organizational capacities.
- **Business environment will transform** digital health is shaping the mindset of entrepreneurs, leading to the internationalization of Portuguese digital health companies.
- **The will be a true transition to personalized and humanized medicine:** the reconfiguration of the healthcare system towards personalized medicine underscores the need for a hybrid medical profession.

About health care evolution

- **Healthcare evolution comes from innovation:** Emphasis is placed on innovation, which drives the transformation of healthcare practices and concepts towards more inclusive, participatory, and knowledge-sharing frameworks.
- **There shall be a shift towards social innovation and active participation:** social innovation emerges as a key aspect in this transformation, highlighting the need for active participation from diverse stakeholders.
- **Education shall be inclusive:** the educational system requires a transformative shift from rigid programs to dynamic flows of information and active engagement, fostering inclusivity and eliminating discrimination.
- **Intergenerational dialogue and active aging will be needed:** encouraging intergenerational dialogue enriches discussions on demographic shifts and digital health use.
- **Collaborative frameworks will evolve:** terms like 'responsibilisation,' 'co-creation,' 'multidisciplinarity,' and 'consortia' are outcomes of collaborative frameworks, aiming for higher standards and certifications.
- **Research initiatives shall consider societal issues:** research projects now prioritize societal aspects and ethical considerations. This marks a comprehensive integration of societal and ethical dimensions into research endeavours.
- **Interoperability will propel cultural challenges:** achieving interoperability in digital health is not merely a technical issue. Cultural factors like siloing and diversity present challenges in establishing a functional digital health ecosystem.
- **Cultural diversity in digital health is pivotal:** addressing interoperability issues requires understanding and compatibility across various cultural, social, and structural contexts encountered in different healthcare systems and regions.
- **Digital health can facilitate comprehensive health:** digital health serves as an enabler for achieving comprehensive health, including humans, animals, and ecosystems.

Final considerations: sociotechnical futures as presente-making via futures imaginations

The exploration of digital health implementation aligns closely with the theoretical framework centered around the interaction between 'experience' and 'expectation'.

- **The experiential dimension** within the theoretical framework mirrors the exploration of practical considerations in the current design of digital health systems. Just as 'experience' unfolds within a defined space, we delved into active user engagement, cultural influences, and logistical hurdles, acknowledging the constraints and contingencies within healthcare.

- **The expectation dimension** in the theoretical framework aligns with discussions about future expectations in digital health implementation. Throughout the presentation, we navigated the terrain of anticipations and visionary aspirations in societal research emphasis, educational transformations, and personalized medicine. These discussions project various visions of the future, envisioning innovation and inclusivity, resonating with the theoretical emphasis on 'expectation' extending towards a horizon.



Thank you!