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<i>Design strategies for future sustainable implementation: overcoming barriers, finding strategies to spread the use of the tools, develop them in other facilities.</i>
This deliverable presents a design strategy from a ' <b>Systems Thinking</b> ' perspective.

# DESIGN STRATEGIES FOR FUTURE SUSTAINABLE IMPLEMENTATION [SYSTEMS THINKING]:

**OVERCOMING BARRIERS,  
FINDING STRATEGIES TO  
SPREAD THE USE OF THE  
TOOLS AND DEVELOP THEM  
IN OTHER FACILITIES**

## Abstract

The following is a short guide in helping future start-ups and projects in the mental health technology field consider design strategies for future sustainable implementation. Discussed are lessons learned from the IT4 Anxiety Interreg project 2019-23.

**Interreg**   
North-West Europe  
**IT4ANXIETY**

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## About

IT4Anxiety is an inter-regional project aimed at reducing anxiety in patients with mental disorders through the implementation of innovative solutions developed by start-ups. The project's objective is to co-create and implement 10 validated solutions that address the needs of approximately 3000 patients facing anxiety disorders. Additionally, the involvement of 15 start-ups is expected to contribute to the creation of around 50 new jobs. The project also aims to provide training systems that benefit nearly a thousand mental health professionals.

## Aims of this guide

This guide seeks to share valuable insights gained from the IT4Anxiety project to assist start-ups in their design process and enhance their sustainability in the market. By providing an overview of the current landscape of challenges and barriers in the design of Mental Health technologies, as well as insights from start-ups in the sector, this guide aims to offer valuable information for the development of effective design strategies for the future sustainable implementation of mental health technologies.

## Need for sustainable design strategies for Mental Health Technologies

The economic impact of mental health problems is substantial, with significant costs associated with their prevalence. According to the World Economic Forum (2023), the global cost of mental health problems was estimated to be £1.9 trillion in 2010, and this figure is projected to rise to £4.6 trillion by 2030. A significant portion of these societal costs, approximately two-thirds, can be attributed to factors such as reduced economic productivity, increased unemployment rates, and diminished job performance. Individually, the costs manifest through decreased productivity among individuals with mental health issues and their caregivers, as well as the often-overwhelming out-of-pocket expenses incurred for healthcare services.

The link between poverty and mental health problems is complex, forming a cyclical relationship where poverty increases the likelihood of developing mental health issues, while mental health problems exacerbate economic disadvantages. This correlation is particularly pronounced in lower-income countries, where the absence of social welfare safety nets and limited access to effective treatments intensify the cycle of disadvantage.

Breaking this destructive cycle requires addressing both the underlying causes and consequences of mental health problems, thereby establishing a foundation for sustainable development across all regions of the world.

In the context of mental health technology, sustainable design encompasses considering the environmental, social, and economic impacts of products and services throughout their entire lifecycle, from initial development to end-of-life disposal. EcoDesign, a crucial tool in the array of approaches, plays a vital role in enabling the Circular Economy.

It is imperative for national governments and international donors to prioritise investment in mental health by incorporating specific targets for mental health within the Health Goal of the Sustainable Development Goals (SDGs). The United Nations recognised mental health as a global development priority in 2016, with an objective to reduce premature mortality from non-communicable diseases by one third by 2030. As we approach 2023, a critical halfway point towards the SDGs outlined by the United Nations, it is an opportune time to put into practice the lessons learned from the COVID-19 pandemic. The pandemic placed unprecedented strain on healthcare systems worldwide and highlighted the significance of global health, demonstrating that strong health systems can safeguard nations and economies. Concerted and collective action is needed to make progress towards achieving SDG 3, which aims to "Ensure healthy lives and promote well-being for all at all ages," leaving no one behind.

Establishing robust and collaborative global research partnerships within the UK and Ireland that leverage technical, scientific, and clinical expertise will facilitate the development of more accessible and affordable mental health technologies. Two major objectives within the SDG goals for the upcoming years are to advance leadership in science and technology, strengthening the global health research base of the UK and partner countries while supporting trade and investment, and to influence the international discourse on the future of global health institutions and initiatives, utilising strategic partnerships to secure new commitments for reform, including promoting equitable and affordable access to new technologies.

**To effectively design sustainable strategies for the development of mental health technology, it is crucial to first identify the challenges and barriers and subsequently overcome them.**



# Current barriers

Implementation science is an emerging and rapidly expanding field that encompasses theories, frameworks, methods, and strategies to promote the adoption and long-term viability of innovations in real-world settings. In the specific context of Digital Mental Health Interventions (DMHIs), notable advancements have been made in identifying factors that facilitate or impede their implementation, as evidenced by various sources (refer to Table 1).



Additionally, frameworks such as the Non-adoption, Abandonment, Scale-up, Spread, and Sustainability (NASSS) framework introduced by Greenhalgh et al. (2017) have been established to predict and assess the success of patient-facing healthcare technologies. Implementation outcomes in the DMHI field have also been defined.

Hermes, Lyon, Schueller, & Glass, 2019.

However, despite these advancements, there exists a gap in understanding the specific methods and techniques, referred to as “implementation strategies” by Powell et al. (2012) and Powell et al. (2015), for effectively implementing DMHIs within healthcare settings. The adoption of evidence-based services necessitates an evidence-based approach to implementation. Implementation strategies offer practical and replicable techniques that guide the implementation process, and their effectiveness is supported by a growing body of evidence (Cochrane Collaboration, 2013; Powell et al., 2019). However, the literature lacks a comprehensive set of implementation strategies specifically tailored for DMHIs in healthcare settings, with only a limited number of proposals and fewer still having undergone testing and dissemination (Graham et al., 2020).

Considering that doctors, psychologists and other therapists often play a crucial role in managing the implementation of new mental health technologies, it is essential to equip them with effective strategies to guide DMHI implementation. While the extent of DMHI usage may vary among psychologists depending on their patient population and practice characteristics, understanding the scope of their work is valuable in supporting this process. It is important that start-up companies in the mental health tech sector are aware of the barriers concerning the implementation of technologies in a clinical setting as well as during the design process of the technology.

**Table 1.** Summary of common barriers to implementation of mental health care technologies.

Individual barriers	Organizational barriers
Stigma associated with mental health and help seeking	Organisational barriers (e.g. scheduling problems)
Preference for traditional delivery of face-to-face care	No available technology support
Concerns with confidentiality, privacy & data breaches	Limited staff resources and staff turn-over
Discomfort with or feeling incapable of using technology	Lack of cultural and ethnic diversity
Complexity of the technology or intervention	Financial costs (e.g. reimbursement, startup costs)
Mobile compatibility issues & interoperability with other systems	Practitioners negative attitudes toward DMHIs
Low digital literacy or awareness of DMHIs	Practitioners resistance to change
Limited research evidence for the DMHI	Practitioners perceived negative impact on consumer safety
Nonadherence & attrition	

Table 1 provides a comprehensive overview of the common barriers to the implementation of mental health care technologies. The barriers are categorized into two groups: individual barriers and organizational barriers.

## Individual barriers

Individual barriers refer to those encountered at the personal level, including stigma related to mental health, preference for traditional face-to-face care, confidentiality concerns, discomfort or lack of capability in using technology, complexity of the technology, mobile compatibility issues, low digital literacy, limited research evidence for DMHIs, and nonadherence & attrition.

## Organizational barriers

Organizational barriers are challenges that exist within the broader systems or institutions, such as organizational issues like scheduling problems, lack of available technology support, limited staff resources, staff turnover, financial costs associated with adoption, practitioners’ negative attitudes toward DMHIs, resistance to change, and concerns regarding the perceived negative impact on consumer safety.

**Table 1** highlights the complexities involved in the implementation of DMHIs. Both individual and organizational barriers present substantial obstacles that need to be addressed for successful and sustainable DMHI adoption. Overcoming the above barriers require many considerations which will be explored in the subsequent section.



# Considerations for Overcoming barriers

Digital technologies hold great promise for advancing mental healthcare delivery and improving outcomes. However, the successful implementation and widespread adoption of mental health technologies face significant barriers.

## 1

### 1. Overcoming Barriers:

#### 1.1 User-centred design:

Research has indicated that many individuals are willing to adopt new technologies to improve their mental health (Dragovic et al., 2018). However, user attrition is a common issue in mental health studies involving technology, with users often dropping out or ceasing technology usage before completing a study. For instance, a study of 93 mobile mental health apps found low overall user retention, with only a 3.9% retention rate at 15 days and a 3.3% retention rate at 30 days (Baumel et al., 2019). Motivating users to start using e-mental health solutions for the first time has also proven challenging (Eccles et al., 2020).

To address these challenges, a user-centered design approach has gained prominence in the development of mental health technologies. By involving end-users and mental health professionals throughout the design process, technologies can be tailored to their specific needs, preferences, and contextual factors (Vial et al., 2018).

This approach ensures that the technologies are usable, acceptable, and meet the unique requirements of the target population. It is important to note that design should not be confused with engineering design, as engineers and designers have different approaches to technology design (Roozenburg and Cross, 1996). Engineers often focus on technical functioning and specific goals, while designers creatively explore the design space for novel possibilities. In healthcare, designers pay attention to unmet needs and ways to improve care, using user-centered practices (Vial et al., 2018). Various human-centered design approaches, such as user-centered design, user experience design, design thinking, participatory design, and co-design, allow end users to significantly influence the design of technologies (Vial et al., 2022).

This literature review aims to explore design strategies that can overcome these barriers and promote the sustainable implementation of mental health technologies. Specifically, we will examine strategies to overcome common barriers highlighted in Table 1, spread the use of technologies, and facilitate their development in diverse facilities.

#### 1.2 Accessibility:

As previously mentioned, individuals in developing countries and socio-economically deprived communities are more susceptible to mental health problems. Enhancing the accessibility of mental health technologies involves considering multiple factors. Technologies should be designed to accommodate individuals with diverse abilities, languages, and literacy levels, as well as ensuring accessibility in socio-economically deprived areas (Bunyi et al., 2021). This is crucial for promoting equitable and inclusive implementation. Incorporating features such as multilingual interfaces, text-to-speech capabilities, and intuitive navigation can improve accessibility and expand the reach of these technologies. Additionally, the technology should be intuitively easy to use for individuals with lower levels of education.

#### 1.3 Privacy and security:

Privacy and security concerns have been identified as significant barriers to the adoption of mental health technologies (Lustgarten et al., 2020). Designing technologies with robust data encryption, informed consent mechanisms, and transparent data handling practices can address these concerns. By prioritizing privacy and security, technologies can instill trust and compliance with data protection regulations (Montagni et al., 2020).





# 2

## 2. Spreading Use of Technologies:

### 2.1 Education and awareness:

Increasing public and professional awareness about mental health technologies is crucial for their widespread adoption. Educational initiatives, such as workshops, webinars, and training programs, can promote understanding of the benefits and effective utilisation of these technologies (Hollis et al., 2019). Collaborating with mental health organisations, universities, and healthcare providers in disseminating knowledge can facilitate the integration of technologies into routine clinical practice.

### 2.2 Integration in clinical settings:

The successful integration of mental health technologies into clinical settings is vital for their utilisation. Seamless integration with electronic health records (EHRs) and telehealth platforms can facilitate communication, data sharing, and collaboration between healthcare professionals and patients (Torous et al., 2020). Integrating technologies into existing clinical workflows ensures that they become an integral part of routine care delivery.

### 2.3 Collaborative partnerships:

Collaborative partnerships with stakeholders, including insurance providers, employers, and community organisations, can play a pivotal role in spreading the use of mental health technologies. These partnerships can address barriers related to funding, reimbursement, and infrastructural support (Mishkind et al., 2021). By aligning interests and pooling resources, collaborative initiatives can enhance access, reduce costs, and establish support structures for sustainable implementation.



# 3

## 3. Developing Technologies in Other Facilities:

### 3.1 Scalability and adaptability:

Designing mental health technologies with scalability and adaptability in mind enables their implementation in diverse facilities and settings. Considering factors such as resource availability, infrastructure constraints, and cultural considerations ensures that technologies can be effectively deployed across different contexts (Eyles et al., 2018). Scalable and adaptable technologies can accommodate variations in needs and resources, thereby promoting their wider adoption.

### 3.2 Co-creation with local stakeholders:

Engaging local mental health professionals, communities, and policymakers in the development process is essential for the successful implementation of technologies in other facilities. Co-creation approaches foster cultural relevance and ownership, ensuring that technologies align with the specific needs and resources of different regions (Langan et al., 2020). Collaborative partnerships between technology developers and local stakeholders facilitate the customization and contextualization of technologies.

### 3.3 Knowledge sharing and capacity building:

Establishing mechanisms for knowledge sharing and capacity building among facilities can support the development and implementation of mental health technologies. Collaborative platforms, training programs, and research networks can facilitate the exchange of best practices, challenges, and innovative solutions (Mishkind et al., 2021). These initiatives enable facilities to learn from each other's experiences and foster a culture of continuous improvement.





# Conclusion

**Effective design strategies are crucial for sustainable implementation of mental health technologies. User-centered design involves involving end-users and mental health professionals throughout the design process to meet their specific needs.**

Accessibility features such as multilingual interfaces and intuitive navigation enhance usability. Privacy measures like data encryption address security concerns. Education and awareness initiatives increase adoption. Integration with electronic health records and telehealth platforms facilitates seamless use in clinical settings. Collaborative partnerships with stakeholders overcome funding and support barriers. Scalability and adaptability ensure deployment in diverse facilities. Engaging local stakeholders fosters cultural relevance. Knowledge sharing and capacity building enable continuous improvement.

These strategies promote widespread adoption and improved mental health outcomes. Insights from projects like the IT4Anxiety inter-reg project can guide start-ups in design strategies for future sustainable implementation of their technologies.

# Design strategies: Systems thinking



# Principles

## Systems thinking overview

Systems thinking is an approach that examines complex systems as interconnected and interdependent entities rather than focusing on isolated parts. It recognizes that the behaviour of a system emerges from the interactions among its components and the broader context in which it operates. Systems thinking helps understand the underlying structure, patterns, and dynamics of a system to identify the root causes of problems and find effective solutions. It emphasizes the interconnectedness of elements, feedback loops, and unintended consequences. By considering the system as a whole, systems thinking enables a more comprehensive understanding of complex issues and facilitates the development of strategies that promote sustainable outcomes. It is used in various fields, including management, engineering, ecology, healthcare, and public policy, to address systemic challenges, improve decision-making, and foster innovation.

## Key principles of Systems thinking

Systems thinking is an approach that recognizes the interconnectedness, dynamics, and emergent behaviour of complex systems. It involves a set of key principles that guide the analysis and understanding of these systems. The principles of systems thinking emphasize a holistic perspective, considering the system as a whole rather than focusing on individual components. They highlight the importance of understanding the relationships and interactions between elements, the presence of feedback loops, and the non-linear nature of cause-and-effect relationships.

Systems thinking also takes into account the influence of boundaries, context, time delays, and multiple perspectives when examining a system. By applying these principles, systems thinking provides a framework for comprehending the complexity of systems and identifying effective strategies for problem-solving and decision-making.

By applying these principles, systems thinking enables a comprehensive understanding of complex systems and facilitates effective problem-solving, decision-making, and the identification of sustainable solutions.

Here are the main principles of Systems thinking:

## Key principles

### 1. Holistic Perspective

Systems thinking emphasizes understanding the system as a whole, rather than focusing on individual components or events. It involves considering the interactions, interdependencies, and relationships between various elements within the system.

### 2. Interconnectedness

Systems thinking recognizes that all parts of a system are interconnected and affect each other. Changes in one part can have ripple effects throughout the system, and understanding these relationships is crucial for effective problem-solving.

### 3. Feedback Loops

Systems thinking examines the feedback loops within a system, which are the mechanisms through which information circulates and influences the system's behaviour. Feedback loops can be reinforcing (amplifying) or balancing (stabilizing), and understanding their dynamics helps to identify leverage points for intervention.

### 4. Emergence:

Systems thinking acknowledges that the behaviour and properties of a system emerge from the interactions among its components and are not solely determined by the properties of individual parts. This principle highlights the importance of understanding the system's overall behaviour rather than focusing solely on individual elements.

### 5. Non-Linearity:

Systems thinking recognizes that systems often exhibit non-linear behaviour, meaning that cause-and-effect relationships are not always straightforward or proportional. Small changes can sometimes lead to significant, unexpected outcomes, making it essential to consider the dynamic and non-linear nature of systems.

### 6. Boundaries and Context:

Systems thinking considers the boundaries of the system being studied and its broader context. Understanding the system's external environment and its interactions with other systems can provide insights into how the system operates and is influenced by external factors.

### 7. Time Delays:

Systems thinking acknowledges that the effects of actions or changes in a system may not be immediately visible. Time delays can occur between a cause and its effect, leading to unintended consequences or challenges in identifying the root causes of problems.

### 8. Multiple Perspectives:

Systems thinking encourages the inclusion of diverse perspectives and stakeholders when analysing and understanding a system. Different stakeholders may have unique insights and understandings of the system, and integrating these perspectives enhances the overall understanding and decision-making process.



## Implementing systems thinking within the context of e-mental health involves the following key steps:

# Guide: How to implement Systems thinking

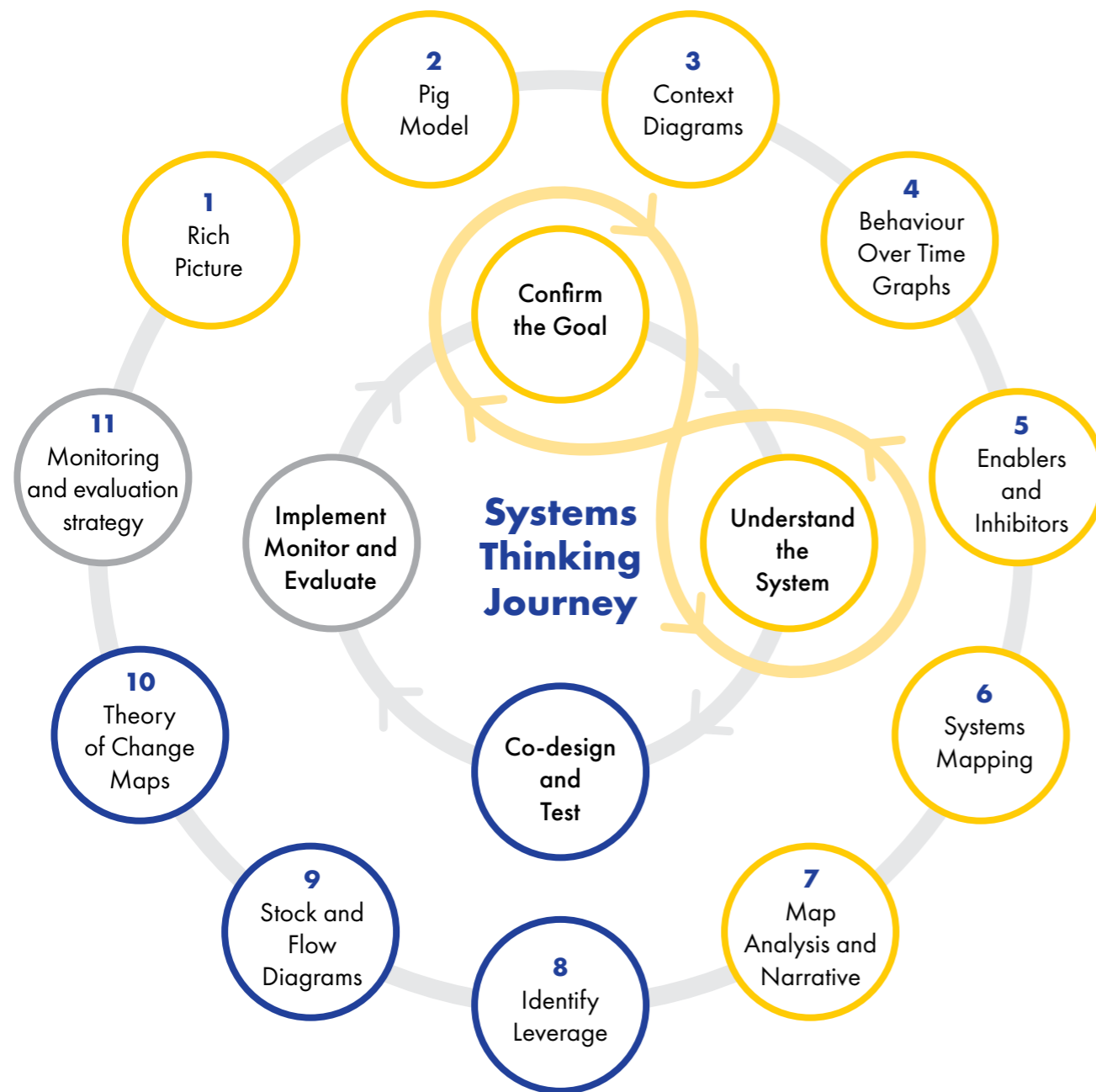


Figure 1. Systems thinking iterative framework

### 1. Define the System Boundaries:

- ▶ Identify the boundaries of the e-mental health system and determine the scope of analysis.
- ▶ Consider the various components, stakeholders, and interactions that make up the system.

### 2. Understand Interconnections and Relationships:

- ▶ Analyse the interconnections and relationships between the different components of the e-mental health system.
- ▶ Identify how changes in one component can impact other elements and the overall system behaviour.

### 3. Identify Feedback Loops:

- ▶ Explore the feedback loops within the system to understand how information and feedback circulate.
- ▶ Identify reinforcing loops that amplify certain behaviours and balancing loops that stabilize the system.
- ▶ Determine the impact of feedback loops on system dynamics.

### 4. Map Cause-and-Effect Relationships:

- ▶ Analyse the cause-and-effect relationships within the e-mental health system.
- ▶ Consider both linear and non-linear relationships, as well as time delays that may exist between causes and their effects.
- ▶ Identify feedback loops that contribute to desired or undesired outcomes.

### 5. Consider External Factors and Context:

- ▶ Assess the external factors and context that influence the e-mental health system.
- ▶ Understand how societal, cultural, regulatory, and technological factors affect the system and its interactions with the external environment.

### 6. Incorporate Multiple Perspectives:

- ▶ Seek input from various stakeholders, including mental health professionals, users, caregivers, and policymakers.
- ▶ Integrate multiple perspectives to gain a comprehensive understanding of the e-mental health system and consider diverse viewpoints when analysing challenges and identifying potential solutions.

### 7. Identify Leverage Points:

- ▶ Identify key leverage points within the system where interventions can have significant impacts.
- ▶ Leverage points are areas in the system where small changes can lead to large and desirable outcomes.
- ▶ Focus efforts on these leverage points to address systemic issues effectively.

### 8. Develop Systemic Strategies:

- ▶ Utilize the insights gained from systems thinking analysis to develop systemic strategies for e-mental health.
- ▶ Consider interventions that target multiple components and leverage feedback loops to foster positive change.
- ▶ Aim for sustainable solutions that address the complexity and interdependencies of the system.

### 9. Monitor and Adapt:

- ▶ Continuously monitor the e-mental health system, assess the effectiveness of interventions, and gather feedback from stakeholders.
- ▶ Adapt strategies based on insights and feedback to ensure ongoing improvement and alignment with changing needs.

**By following these key steps, organizations can adopt a systems thinking approach to understand and address the complexities of e-mental health. This approach allows for a more comprehensive understanding of the system, promotes effective problem-solving, and supports the development of sustainable solutions that positively impact mental health outcomes.**

# Building for sustainability: overcoming challenges with systems thinking

**Systems thinking provides a powerful framework for overcoming barriers in e-mental health. By understanding the interconnectedness and complexity of the system, it enables a holistic perspective that goes beyond isolated challenges.**

Systems thinking allows us to identify feedback loops and understand how interventions impact the system as a whole. It encourages collaboration and engagement of diverse stakeholders, facilitating the identification of barriers from multiple perspectives and the development of comprehensive solutions.

Moreover, systems thinking promotes continuous learning and adaptation, enabling ongoing monitoring and adjustment to address emerging barriers effectively. By applying systems thinking, we can address the root causes of barriers, foster sustainable change, and develop impactful solutions that enhance e-mental health outcomes.



## Design thinking within IT4Anxiety Startups

As part of IT4Anxiety activities, a series of six focus groups were conducted to learn more about the startups' product development and testing journey. Eighteen startups took part in at least one focus group; transcripts from the focus were analysed to provide insights on how they approached sustainable development and implementation.

Based on the provided focus group transcripts, there were indications of elements related to systems thinking in the discussions among the startups. Systems thinking is an approach that emphasizes understanding the interconnections and relationships within a complex system to identify patterns, feedback loops, and the broader context in which a problem exists. Although the startups did not explicitly mention the term "systems thinking," certain aspects aligned with its principles.

One area where systems thinking was apparent was in the consideration of different user groups and their specific needs. The startups recognized the diverse skills, preferences, and requirements of users, such as individuals suffering from dementia, their relatives, and caregivers. They discussed the challenges of developing products that catered to these varied user groups and emphasized the importance of user interface design and usability.

Moreover, the startups acknowledged the influence of external factors and constraints on their product development. They mentioned regulatory standards, data protection, and compliance with EU regulations as crucial considerations. This recognition of external factors and their impact on the development process reflects an awareness of the broader system in which their products operate.

Additionally, the startups discussed the iterative nature of their development process, considering feedback loops and the need to continuously adapt and improve their products based on user input. This iterative approach aligns with the feedback loops and adjustments characteristic of systems thinking.

Although the startups did not explicitly discuss system boundaries or causal loop diagrams, their recognition of user diversity, consideration of external factors, and iterative approach indicate elements of systems thinking. By acknowledging the interconnectedness and complexity of the system within which their products operate, the startups demonstrated a systems thinking mindset in their discussions.

# Challenges and barriers identified

The focus groups conducted revealed several common themes and challenges encountered in product development. These discussions involved participants sharing their experiences and insights regarding various aspects of their projects. By aggregating the frequency tables generated from the focus groups, we can identify key themes that emerged consistently across multiple discussions. These themes shed light on the challenges faced by the participants and provide valuable insights for navigating the complexities of product development.



## Summary of Themes:

# 01

### Resource Constraints

A prominent theme was the limitation of resources, including financial, human, and technological resources. Participants expressed the challenge of balancing their product development goals with limited available resources, such as funding, staffing, and technology infrastructure.

# 02

### User Interface (UI) and User Experience (UX)

The importance of designing user-friendly interfaces that meet the diverse needs of the target user groups was emphasized. Participants highlighted the need to ensure intuitive and accessible interfaces for users, particularly those with limited digital literacy or specific cognitive abilities.

# 03

### Compliance with Standards and Regulations

The focus groups revealed the challenges associated with conforming to EU compliance standards, including GDPR and CE regulations. Participants discussed the complexity and costs associated with ensuring regulatory compliance while developing their technologies.

# 04

### Legacy Systems

Participants discussed the difficulties of building upon existing frameworks or outdated technologies. They highlighted the challenges of integrating new features and maintaining compatibility with legacy systems, which often required extensive adaptations and posed technical hurdles.

# 05

### User Feedback and Testing

The importance of obtaining user feedback throughout the development process was emphasized. Participants shared their strategies for collecting feedback, such as conducting interviews, usability questionnaires, and prototype testing, to validate their technology and ensure it met user needs.

# 06

### Business Operations and Funding

Participants discussed the challenges of managing business activities, including securing funding and ensuring running costs while focusing on product development. Strategies to minimize risks and optimize time allocation were explored to maintain progress amid financial constraints.



# Issues & Challenges

These themes provide valuable insights into the complexities and considerations involved in product development. By understanding these challenges, developers and organizations can better prepare and strategize for successful product development initiatives. Based on the tables generated from the various focus groups, the following is an aggregated frequency table of the issues/challenges discussed:

**Table 2:** Aggregated frequency table

Issue/Challenge	Frequency
Resource constraints	5
User interface (UI) and user experience (UX)	4
Compliance with standards and regulations	3
Legacy systems	2
User feedback	2
Business operations and funding	2
Accessing the user group	2
Medical/therapeutic expertise	2
Decision-making and feature prioritization	1
Data protection and data safety	1
Availability of user resources	1
User-friendliness	1
Going to market	1
Technology conformity	1
Running costs	1
Time management	1

This frequency table provides an overview of the most commonly discussed issues and challenges across all focus groups, highlighting the recurring themes and areas of concern.

Based on this analysis, it is evident that resource constraints and user feedback/testing were the most frequently discussed challenges, with 15 and 13 occurrences, respectively. User interface (UI) and user experience (UX) were also highlighted as significant considerations, with 12 occurrences. Compliance with standards and regulations, legacy systems, and business operations and funding were discussed relatively less frequently, but still remain important factors to address during product development.

Overall, the focus groups revealed consistent themes and challenges in product development, with resource constraints, user interface/experience, and user feedback/testing emerging as key areas of focus. These findings emphasize the need for careful resource allocation, user-centric design, and iterative feedback loops to ensure the successful development of products that meet user needs while complying with regulations and operating within limited resources. By addressing these challenges effectively, organizations can enhance their product development strategies and increase the likelihood of successful outcomes.

Issue/Challenge	Occurrence
 <b>01</b> Resource Constraints	<b>15</b>
 <b>02</b> User Interface (UI) and User Experience (UX)	<b>12</b>
 <b>03</b> Compliance with Standards and Regulations	<b>10</b>
 <b>04</b> Legacy Systems	<b>8</b>
 <b>05</b> User Feedback and Testing	<b>13</b>
 <b>06</b> Business Operations and Funding	<b>9</b>

# Overcoming barriers with Systems thinking

Systems thinking can be used to overcome the following challenges identified in the focus groups:

## 1 Resource Constraints:

Systems thinking encourages exploring alternative resource allocation strategies. By understanding the interconnectedness of resources, organizations can identify leverage points to optimize resource utilization. It involves considering partnerships, collaborative networks, and innovative funding models to mitigate the impact of limited resources.

## 4 Legacy Systems:

Systems thinking helps organizations navigate the challenges of integrating new features and maintaining compatibility with legacy systems. It involves analysing the dependencies and feedback loops associated with legacy systems, identifying areas of adaptation or modernization, and considering phased transition strategies to minimize disruptions.

## 2 User Interface (UI) and User Experience (UX):

Systems thinking recognizes the importance of designing user-friendly interfaces that cater to diverse user needs. It involves user research, prototyping, and iterative feedback loops to ensure intuitive and accessible interfaces. By understanding the interdependencies between UI/UX and other system components, organizations can create cohesive and user-centric e-mental health products.

## 5 User Feedback and Testing:

Systems thinking promotes a culture of continuous learning and adaptation. It involves integrating user feedback and testing as iterative feedback loops throughout the development process. By considering user feedback as an integral part of the system, organizations can improve the user experience, validate assumptions, and ensure the developed products effectively meet user needs.

## 3 Compliance with Standards and Regulations:

Systems thinking enables organizations to consider regulatory requirements as an integral part of the system. By mapping compliance requirements, identifying interconnections with other system elements, and analysing feedback loops, organizations can develop strategies to achieve compliance effectively and efficiently.

## 6 Business Operations and Funding:

Systems thinking takes into account the interdependencies between business operations, funding, and product development. It involves exploring strategies to optimize time allocation, minimize risks, and secure funding. By considering the systemic impact of business operations, organizations can develop sustainable business models that support e-mental health product development.

By applying systems thinking to address these challenges, organizations in e-mental health can gain a holistic understanding of the system's dynamics and interdependencies. This approach helps identify leverage points, design user-centric solutions, optimize resource utilization, ensure compliance, and develop sustainable business strategies. By addressing these challenges systematically, organizations can enhance the development and delivery of effective and impactful e-mental health products.



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**DESIGN STRATEGIES  
FOR FUTURE  
SUSTAINABLE  
IMPLEMENTATION  
[SYSTEMS THINKING]:**



**OVERCOMING BARRIERS, FINDING  
STRATEGIES TO SPREAD THE USE OF  
THE TOOLS AND DEVELOP THEM IN  
OTHER FACILITIES**