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Executive Summary

The CONNECTINGHEALTH project is dedicated to fostering interconnected and inclusive innovation ecosystems across Europe, with a particular focus on maximising the value of innovation in the digital health sector. At its core, the project aims to contribute to the long-term sustainability and advancement of healthcare in the European Union and beyond. The Comprehensive Multi-Year Action Plan emerges as a key output of the project's efforts. This strategic document outlines the objectives, activities, and timeline for achieving specific goals over the next five years, with a vision to shape the optimal future for health, particularly in the realm of digital innovation and implementation. The primary audience for this deliverable includes the EU Commission, providing insights to inform future policy or funding calls, and various stakeholder groups (i.e., national and regional governments, academia, industry, and civil society, aiming to enhance visibility and foster collaboration towards advancing such initiatives.

With the use of inclusive development processes leading to the creation of an Action Plan, our approach has integrated collaborative input from diverse stakeholders and synthesises outputs from various project work packages. Notably, the Plan draws insights from stakeholder engagement initiatives and project-led reports, with highlights including four stakeholder-specific focus groups and two comprehensive validation/verification sessions.

The Multi-Year Action Plan is a crucial guide for advancing digital health innovation and sustainable healthcare ecosystems in Europe. It leverages emerging insights to provide actionable recommendations for driving meaningful change. Key recommendations include creating multi-stakeholder ecosystems, developing health-related curriculum, enhancing awareness of health innovation, government stakeholder mapping, and establishing a knowledge-sharing marketplace. Implementation should prioritise realistic and sustainable funding and resource allocation, with potential for replication on regional, national, and international levels.

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List of Abbreviations

Abbreviation	Full Terminology
AI	Artificial Intelligence
EU	European Union
GDPR	General Data Protection Regulation
SDGs	Sustainable Development Goals
T	Task
UK	United Kingdom
UN	United Nations
WP	Work Package

1. CONNECTINGHEALTH Project Overview

The societal challenges of the modern era have reshaped our world and impacted various sectors, including healthcare. These challenges have underscored the importance of innovative solutions beyond traditional approaches. For instance, the integration of digital technologies and data has shown promise in addressing societal issues. However, it has also exposed disparities and shortcomings in the adoption and design of these technologies across different regions. This highlights the necessity of fostering innovation ecosystems to better support the development and implementation of solutions aimed at tackling societal challenges.

European countries, including the European Union (EU), United Kingdom (UK), and others, contend with fierce global competition in healthcare technology. This necessitates enhanced collaboration, innovation, and investment across the continent to capitalise on its strengths. Beyond economic concerns like market share loss and job displacement, reliance on non-EU technologies threatens sovereignty and vital sectors like healthcare. The European Commission's initiatives (like the EIC Pathfinder[1]) aim to address these challenges by promoting collaboration and investment in healthcare technologies, safeguarding EU autonomy. Collaboration among European countries, and various stakeholder groups, fostering innovation and positioning the EU as a global leader in healthcare technology, thereby enhancing citizen well-being and security.

With this in consideration, "CONNECTINGHEALTH - CONNECTing the dots withIN diGItal HEALTH Innovation Ecosystems" is a two-year preparatory action for setting up joint programme among the actors of the digital health ecosystems in Europe and beyond. The overall aim of the project is fully aligned with the call for proposals, which is to foster interconnected, inclusive innovation ecosystems across Europe and maximising the value of innovation in one of the sectors that provides the future opportunities for growth and increased competitiveness and innovativeness, namely the digital health.

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[1] https://eic.ec.europa.eu/eic-funding-opportunities/eic-pathfinder_en

CONNECTINGHEALTH[2] is implemented by the small and agile core group, which consists of the European Connected Health Alliance (ECHAlliance) as a European partner and three organisations that are leaders of the digital health ecosystems in their regions: Scottish Enterprise (Scotland, United Kingdom), Pannon Business Network Association (Western Hungary) and Seinäjoki University of Applied Science (South Ostrobothnia, Finland).

To reach its goals, CONNECTINGHEALTH has been conducting the mapping of the digital health ecosystems in Europe, their initiatives, projects, resources, and stakeholders. Additionally, it has been developing the future scenario for the digital health sector in Europe 2030, and identifying the preferable future that will be the base for the Multi-Year Action Plan. This plan is co-designed together with the stakeholders and ecosystems engaged in the project through the futures and investigative workshops.

Besides the investigation on the general level of the digital health, this project has looked deeper into the three topics crucial for the further development of the digital health sector in Europe, namely:

1. Health for wealth opportunities
2. Opportunities of the transition from traditional industry to digital health industry
3. Opportunities of engaging the stakeholders from the health and social sector in the development and implementation of the solutions.

In the above context, the CONNECTINGHEALTH project has the overall objective of fostering interconnected and inclusive innovation ecosystems across Europe and maximising the value of innovation in the digital health sector, with a long-term and sustainable vision.

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[2] https://echalliance.com/projects/connectinghealth/

Figure 1. CONNECTINGHEALTH project partners (ECHAlliance)

1.1 CONNECTINGHEALTH Objectives

- **Objective 1:** To map the landscape of the digital health ecosystems in Europe and beyond including their stakeholders, resources, initiatives, projects and political frameworks.

- **Objective 2:** To explore the current and future opportunities for growth of the digital health sector, and its competitiveness.

- **Objective 3:** To engage a wide range of stakeholders from governments, industry, academia and society in the development of the Multi-Year Action Plan for the sustainable and thriving digital health sector in Europe.

- **Objective 4:** To connect and interconnect the existing regional and thematic digital health ecosystems for better cooperation, learning, exchange of best practices and wider impact.

1.2 Work Package 6 Objectives

The objectives within Work Package (WP) 6 of CONNECTINGHEALTH are as follows:

- To plan the multi-year action in cooperation with the stakeholders,
- To identify the funding opportunities to finance the action,
- To validate the action with the key stakeholders and,
- To ensure its sustainability through the submission of the application to one of the funding instruments available.

Through these coordinated efforts within WP6, the project aims to establish a solid foundation for the successful implementation and impact of its objectives within the digital health innovation ecosystem.

2. Background

The landscape of healthcare is undergoing a profound transformation in the European Union and worldwide driven by rapid advancements in digital technologies. In response to the challenges posed by ageing populations, rising healthcare costs, and the increasing burden of chronic diseases, there is a growing recognition of the potential of digital health innovation to revolutionise healthcare delivery and improve patient outcomes.

The European Union's Next Generation EU initiative[3], and the Horizon Europe Strategic Plan 2025-2027[4], along with the United Nations' (UN) Sustainable Development Goals (SDGs)[5], underscore the importance of leveraging innovation to address pressing global health challenges and promote inclusive and sustainable development. With its focus on fostering interconnected, inclusive innovation ecosystems, Next Generation EU aligns closely with the principles of the SDGs, particularly Goal 3: Good Health and Well-being[6], and Goal 9: Industry, Innovation, and Infrastructure[7]. As such, digital health innovation promises to enhance healthcare access, quality, and efficiency while empowering individuals to manage their health. Technologies like telemedicine, wearables, and artificial intelligence, offer transformative opportunities for healthcare delivery, preventive care, and population health management. Collaboration among policymakers, healthcare providers, stakeholders, and civil society can address disparities, promote equity, and build resilient healthcare systems.

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[3] https://commission.europa.eu/strategy-and-policy/eu-budget/eu-borrower-investor-relations/nextgenerationeu_en#:~:text=NextGenerationEU%20is%20a%20groundbreaking%20temporary,digital%20and%20more%20resilient%20future.

[4] https://ec.europa.eu/commission/presscorner/detail/en/ip_24_1572

[5] https://sdgs.un.org/goals

[6] https://sdgs.un.org/goals/goal3

[7] https://sdgs.un.org/goals/goal9

3. Deliverable Introduction

3.1 Deliverable objective and scope

Deliverable 6.1 (D6.1), Comprehensive Multi-Year Action Plan, led by ECHAlliance, is a main output of the CONNECTINGHEALTH project. This document aims to outline the objectives, activities, and timeline for achieving specific goals for the next five years with respect to designing the optimal future for (digital) health in the European Union (EU) and beyond - with a consideration of the various opportunities in the domain.

This action plan is based on the outputs of WP2, WP3 and WP4, alongside the engagement of diverse stakeholders in WP5. The plan aims to place an emphasis on the multi-stakeholder cooperation, exploitation of possible, probable and preferable futures, inclusion of diverse points of views, and the strong alignment with the goals of the Next Generation EU and UN SDGs.

The plan has been validated and finalised with various stakeholder groups through the use of active engagement opportunities, stakeholder-specific focus groups, and cross-sectoral consultation validation workshops and external review.

3.2 Key components of the deliverable

The development and implementation of a Multi-Year Action Plan provides pivotal steps in responding to the European Commission's directives. The key components/content essential for crafting this comprehensive plan that aligns with the Commission's objectives includes the following:

- **Delineating clear objectives and goals** setting the foundation for the Action Plan, ensuring it is purpose-driven and outcome-oriented.
- **Methodological rigour** ensures that the plan is grounded in robust research, analysis, and strategic thinking.
- **Defining tasks and responsibilities for the Action Plan** - establishing accountability and clarity on who is responsible for what, streamlining the idealised implementation process and enhancing efficiency.
- **Explanation of stakeholder engagement and involvement** throughout the development of the Plan and in the Plan itself, ensuring inclusivity, fostering

collaboration, and garnering support from key actors, thus enhancing the plan's ideal effectiveness and sustainability.

- **Outlining expected resource allocation** as an imperative factor for delineating the financial, human, and technological resources required for executing the Action Plan efficiently.
- **Integration of risk management/mitigation strategies,** which mitigate potential obstacles and ensure smooth execution.
- **Explanation of a communication/dissemination plan** to ensure transparency, awareness, and stakeholder buy-in
- **Planning for monitoring and evaluation mechanisms** to enable continuous feedback and improvement, ensuring the Action Plan remains dynamic and responsive to evolving needs and challenges.

Through attention to these key components, the Multi-Year Action Plan can serve as a robust framework for advancing the Commission's objectives effectively and sustainably.

3.3 Relation to other WPs and tasks/deliverables

D6.1: Comprehensive Multi-Year Action Plan, led by ECHAlliance, is heavily reliant on all of the project progress to date from each of the work packages in passing. However, the outputs of various tasks and deliverables have more heavily influenced the development of this project deliverable, such as the Future Scenarios Workshops (WP2), Report on Lessons Learned on the Three Focus Areas (in digital health) (WP3), and the Focus Groups & Validation Consultancy Workshops (WP6) have directly influenced this report and will be highlighted in particular. The relation between other WPs and deliverables is presented below:

Table 1. Relation to other WPs and tasks/deliverables

WP	Deliverable/Task	Relationship
WP2	D2.1	**Map of the digital health ecosystems in Europe and beyond** - *providing the consortium insight on the current landscape which influences recommendations and accountability*

WP2	D2.2	**Paper: Scenarios for the digital health sector in 2030** – *providing the ideal vision of digital health for the future which the Action Plan aims to work towards*
WP2	D2.3	**Paper: Lessons learned from other domains of health** – *providing insight to what has worked and what has not to contribute to useful and timely recommendations*
WP3	D3.1	**Report on the three focus areas** – *to reflect on opportunities for the digital health industry*
WP3	D3.2	**Paper: Lessons learned from the three focus areas** – *to reflect on opportunities for the digital health industry*
WP4	D4.1	**The body of knowledge** – *to understand the differences between regions and countries in relation to digital health implementation and the influence of economic and health policy in its role for future recommendations*
WP4	D4.2	**SWOT analysis** – *to understand the digital health landscape and opportunities that can be applied to the Multi-Year Action Plan*
WP4	D4.3	**Paper: Conclusions for further action** – *to help influence and prioritse next steps*
WP5	D5.1	**Map of the key stakeholders** – *to understand who is necessary to engage in the Multi-Year Action Plan*
WP6	T6.1	**Inclusive development of the plan** – *gathered feedback from all stakeholder groups to better understand dependencies and impact evolution of optimal future for digital health which is applied to this deliverable*
WP6	T6.3	**Validation and finalisation of the plan with stakeholder groups** – *to ensure that the key takeaways from T6.1 are relevant across stakeholder groups and can be applied to D6.1*

3.4 Importance of inclusive development and co-creation

In the context of the CONNECTINGHEALTH project, the emphasis on inclusive development and co-creation is paramount. As the project endeavours to establish a joint program among stakeholders within Europe's digital health ecosystems (and beyond), it underscores the importance of inclusivity in fostering interconnected innovation networks.

The Quadruple Helix Approach for innovation integrates academia, industry, government, and civil society as equal partners in the innovation process, emphasising collaboration and co-creation. In digital health innovation projects, this approach is crucial as it leverages the expertise and perspectives of diverse stakeholders, including healthcare professionals, technology developers, policymakers, and patients. By fostering interdisciplinary collaboration and incorporating end-user feedback from the outset, the Quadruple Helix Approach ensures that digital health solutions are not only technologically advanced but also socially acceptable, ethically sound, and effectively implemented, leading to more sustainable and impactful outcomes in healthcare delivery.

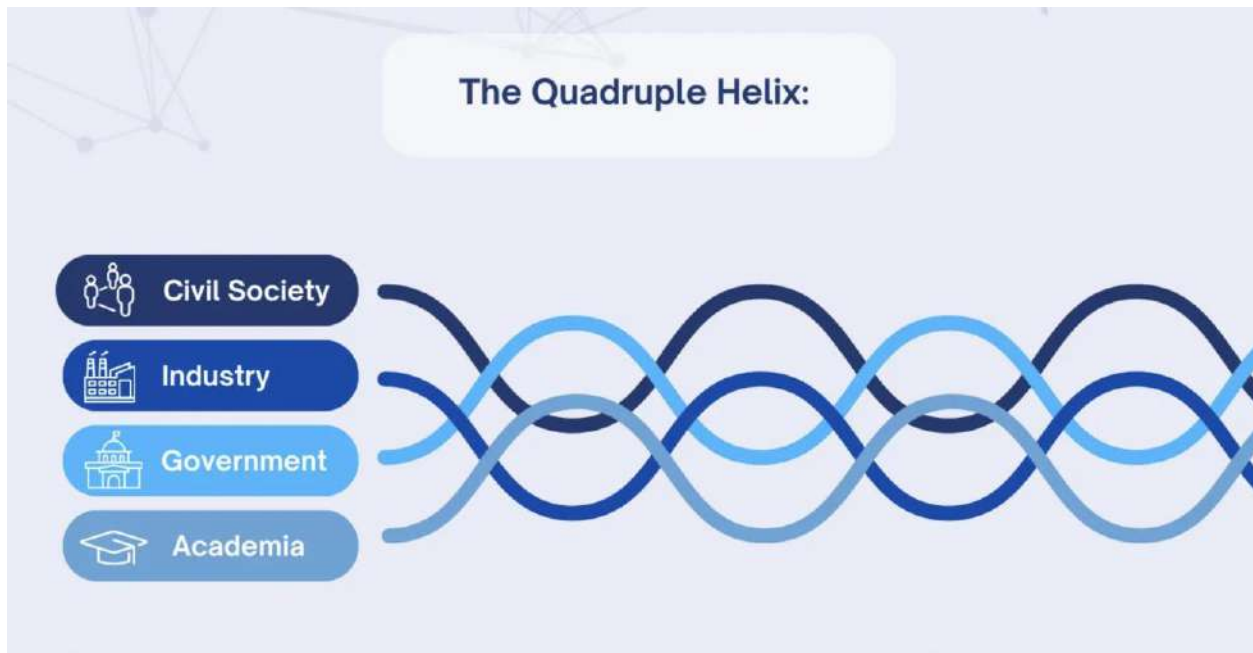**Figure 2.** The Quadruple Helix approach for innovation (adapted by ECHAlliance)

With this justification, the CONNECTINGHEALTH project greatly adopted this approach not only to ensure that the resulting solutions are tailored to meet the diverse needs of stakeholders, across different regions and countries, but also to help ensure competitiveness, and innovativeness within the digital health landscape in Europe and beyond.

4. Previous Work Package Outputs

The development of D6.1, Comprehensive Multi-Year Action Plan, relies significantly on the cumulative progress achieved across all project work packages to date. However, specific project outputs from key tasks and deliverables have exerted a more pronounced influence on shaping this project deliverable. Notably, **outputs from initiatives such as the Future Scenarios Workshops (WP2), the Report on Lessons Learned on the Three Focus Areas in digital health (WP3), and the Focus Groups & Validation Consultancy Workshops (WP6) have directly influenced the content of this report** and will be emphasised accordingly. These outputs are described in more detail below in sections 4.1, 4.2 and 4.3 of the document.

4.1 Future Scenarios Workshops

The Future Scenarios Workshops, as part of WP2, T2.2 Scenario Planning - Digital health in 2020, led by ECHAlliance, were structured to envision the future landscape of the digital health sector in Europe and beyond. This methodology involved a series of interactive workshops spanning five phases, including preparatory research, thematic co-creation workshops with stakeholders, scenario development, validation, and dissemination of results. Through these workshops, diverse stakeholders collaborated to identify key assumptions and drivers for change in the digital health domain. The most significant outcome was the formulation of four scenarios for digital health in 2030, providing valuable guidelines for navigating potential risks and fostering purposeful problem-solving across disciplines and sectors.

The findings from these workshops offer deep insights into the current barriers, enablers, and landscapes of various digital health themes, laying a foundation for informed decision-making and strategic planning. They underscore the importance of cross-disciplinary collaboration and whole-of-society approaches in driving digital health innovation. While the workshops have proven effective in stimulating creative thinking and exploring future scenarios, the project team highlighted the need for continued research and multidisciplinary action to address existing gaps in digital health innovation.

CONNECTINGHEALTH future workshops

Digital Therapeutics & Digital Pharma	11th Oct 2022	SZOMBATHELY, HUNGARY
Telehealth & Remote Patient Monitoring	11th Oct 2022	SZOMBATHELY, HUNGARY
Digital Health Softwares & Platform Solutions	26th Oct 2022	GALICIA, SPAIN
Reimbursements & Financial Mechanisms	30th Nov 2022	VIRTUAL
Digital Health Skills & Workforce	14th Dec 2022	ATHENS, GREECE
Digital Health Skills & Workforce	13th Jan 2023	VIRTUAL
Virtual Clinical Trials	18th Jan 2023	VIRTUAL
Digital Health Data	19th Jan 2023	VIRTUAL
Personalised Nutrition	9th Feb 2023	VIRTUAL
The future of Digital Health - FINAL WORKSHOP	March 2023	BARCELONA SPAIN

Figure 3. The Futures Workshop topics and schedule (ECHAlliance)

The findings from the completed workshops highlighted key barriers and enablers towards achieving a pro digital-health future as seen in Table 2 below.

Key Barriers	Key Enablers
- Fragmented policy frameworks - Inadequate collaboration - Low digital literacy - Lack of trust - Data safety concerns - Poor data quality - Conservative mindsets - Absence of widely accepted standards - Limited resources	- Supportive digital health policies - Electronic health record implementation - Advancing technology - Innovative insurance models - Increased adoption of digital health solutions - Growing public interest - Demographic engagement opportunities - Importance of health equity

Table 2. Key barriers and enablers towards achieving a pro digital-health future

These findings underscore the importance of co-creation in healthcare services and emphasise the necessity of collaboration among all stakeholders within the

healthcare ecosystem, including healthcare professionals, health systems, patients, insurers, regulators, payers, and the pharmaceutical industry, to realise the future potential of digital health.

The main output from these workshops was the development of four scenarios for digital health in 2030, each addressing critical uncertainties. In the scenario titled "Digital health is health," empowered healthcare professionals and citizens embrace digital systems, leading to improved access to healthcare services and optimised resource allocation.

Conversely, in the "It's a limbo" scenario, scepticism and insufficient understanding hinder digital health adoption, resulting in limited uptake and fragmented implementation. In the "The black hole" scenario, technology giants exert significant control over the health sector, exacerbating privacy concerns and regulatory challenges.

Finally, in the "The status quo?" scenario, despite a favourable perception of digital health solutions, fragmented implementation and policy failures contribute to limited regional and national uptake, perpetuating the status quo of disjointed digital health initiatives. These scenarios highlight the complex interplay of factors shaping the future of digital health and underscore the importance of proactive policy-making and stakeholder collaboration to realise its potential benefits.
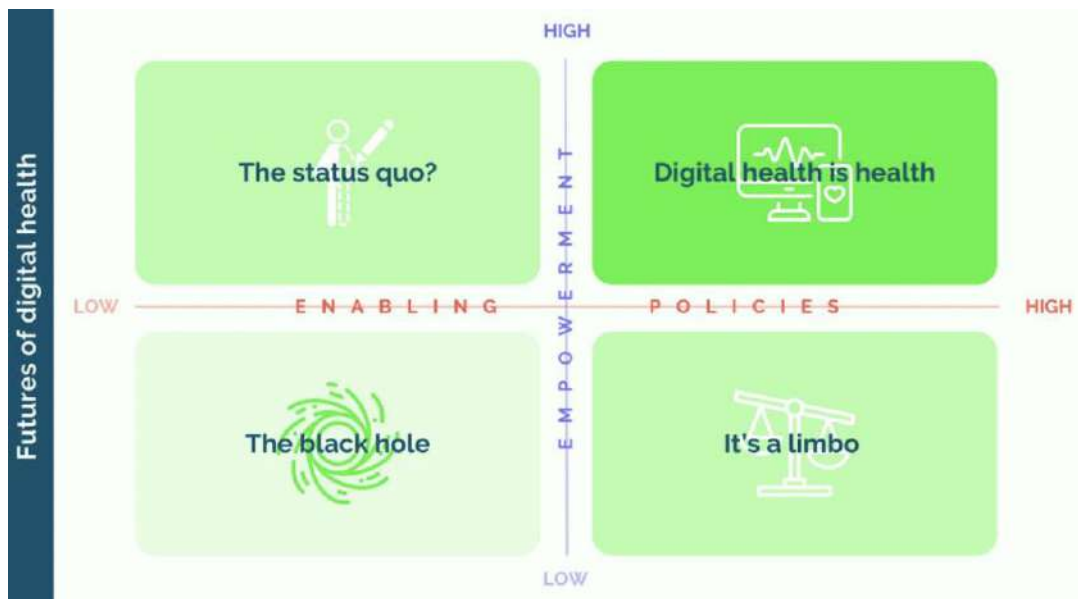
Figure 4. CONNECTINGHEALTH four scenarios for digital health in 2030 (ECHAlliance)

The full findings from this project output can be found in project deliverable D2.2 Scenarios for the digital health sector in 2030.[8] Moving forward, the insights gathered from the Future Scenarios Workshops have helped to inform the development of a practical Multi-Year Action Plan - especially when considering that the objective for the action plan is heavily connected with moving to a future scenario where "digital health is health" (seen in the top right quadrant in Figure 4 where enabling policies are high, and empowerment levels are high).

4.2 Report on Lessons Learned on the Three Focus Areas

The "Report on Lessons Learned on the Three Focus Areas" (D3.2) synthesised insights from three distinct areas explored by project partners. The lessons learned across the three focus areas, namely 'Health for Wealth,' 'From Traditional to Digital health industry,' and 'Supporting health and social care stakeholders in promoting and adopting digitalisation and new technologies in health and social care services,' reveal crucial insights for the advancement of digital health in Europe.

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8   https://echalliance.com/wp-content/uploads/2023/10/CONNECTINGHEALTH_D2.2-Scenarios-for-the-digital-health-sector-in-2030.pdf

These findings underscore the pivotal role of digital health technologies in transforming healthcare delivery, particularly highlighted by the COVID-19 crisis, emphasising the need for increased efficiency, quality, and cost efficiency in the healthcare system. Clear links between economic and health policies are evident, with supportive health policies seen to bring about direct and indirect economic benefits. The triple helix approach in Scotland serves as a potential model, showcasing the synergy between academia, industry, and healthcare systems in driving digital health innovation, albeit requiring further investment and time for full realisation.

Additionally, the transition from traditional to digital health faces cultural barriers and resource constraints, necessitating a phased approach to support implementation. Opportunities in precision medicine, personalised nutrition, and FemTech present significant growth potential, but greater collaboration and knowledge sharing across Europe are needed. Digital technologies in rehabilitation show promise in improving patient engagement and data collection, yet challenges such as compatibility issues and regulatory hurdles persist.

Key challenges in digital health adoption include funding shortages, lack of education among healthcare professionals, data privacy concerns, and interoperability issues. Stakeholder needs identified underscore the importance of investing in digital health, providing training, prioritising data security, and fostering a culture conducive to digital solutions. Future plans focus on improving telehealth, adopting artificial intelligence (AI) -driven solutions, and enhancing digitalisation strategies, with recommendations emphasising the need for skill development, user-friendly technologies, and coordinated strategies to overcome barriers and realise the full potential of digital health in Europe.

Recommendations included greater collaboration, investment, education, and personalised healthcare approaches, with identified main issues including the need for increased funding in the healthcare sector in addition to increased knowledge of funding opportunities, additional schooling and educational support of upskilling or curriculum additions to accommodate digitalisation and up-take, and the transition towards digital patient care. These findings provide valuable insights for shaping the multi-year action plan, emphasising the importance of

addressing barriers and leveraging collaborative efforts to advance digital health innovation across Europe.

The full findings from this project output can be found in project deliverable D3.2 Paper: Lessons learned from the three focus areas. The findings curated from this particular report have too contributed to shaping the development of a practical Multi-Year Action Plan.

4.3 Focus Groups & Validation Consultancy Workshops

A series of focus groups and validation workshops were conducted virtually between December 2023 and March 2024 to gather input from stakeholders. Four stakeholder-specific focus groups (each for industry, academia, government and civil society) were held after finalising dates and promoting them through various social media channels across the project consortium members. These sessions aimed to: (1) *work to uncover and better understand the synergies between each of the focus groups and other focus groups with consideration to building a desirable future of (digital) health*, and (2) *to understand what actionable steps can be taken to achieve a desirable future* - considering what needs to happen, and by whom. The three questions that were openly discussed in these sessions (in pair with the summaries to these questions) are as follows:

1. **What are your current perceptions on digital health innovation and implementation within your specific stakeholder group?**
    o   Stakeholder groups expressed a mix of excitement and concerns regarding digital health. Civil society highlighted issues like isolation in innovation, uneven access, and data privacy. Industry stressed the need for strong data, collaboration across sectors, and user-centred development. Academia felt their innovations weren't fully utilised and called for better communication with healthcare providers. Governments acknowledged challenges around scaling up effectively, workforce sustainability, and building trust with the public, while emphasising collaboration and education as key to success.

2. **What needs to happen in order to achieve your vision for digital health implementation in your sector in the future? Who is responsible?**
   - Achieving success in digital health requires a multi-pronged approach with shared responsibility. Civil society needs clear communication and successful use cases to build trust. Industry requires smoother financial channels and supportive government policies. Academia emphasises user-centric design and collaboration across sectors, while also advocating for clearer communication of public needs. Governments need to streamline regulations, foster innovation environments, and encourage diverse participation from all stakeholders. Ultimately, a collaborative "Quadruple Helix" approach, involving all stakeholder groups with government leadership, is seen as the key to achieving successful digital health implementation.

3. **What are your expectations of other sectors in order to help implement digital health innovation in your sector?**
   - Stakeholders across the board emphasised collaboration as key to successful digital health implementation. Civil society expects clear communication, user-centric design, and cost-effectiveness studies from other sectors. Industry looks for improved training programs, third-sector support, and academic involvement in translating ideas to businesses. Academia desires earlier inclusion in the innovation process, more flexible funding opportunities, and easier access to investors. Governments are seen as crucial in fostering cross-sector collaboration, particularly in education and crisis response, while also ensuring regulations act as enablers rather than roadblocks for innovation.

Figure 5. Snapshot of project Verification Workshop at the Mobile World Congress in Barcelona (ECHAlliance)

Following the initial focus groups, all of the collected data and additional data were analysed in order to feed the creation of the next step - two validation consultancy workshops bringing together all stakeholder groups in the same session. The first session took place in-person at the Mobile World Congress in Barcelona in February 2024 and the second session virtually in March 2024. The aim of these two sessions were (1) to consult and discuss results from the previously conducted stakeholder-segmented focus groups, ensuring alignment and understanding of opportunities, enablers, and barriers across academia, government, industry and civil society, and (2) to prioritise key initiatives for policy recommendations and establish next steps in the context of digital health innovation implementation across sectors to feed the Multi-Year Action Plan.

The outcome of these sessions worked to better understand the synergies across stakeholder groups and fill in the blanks within the previously collected data across

regions and countries. Additionally, these sessions helped to prioritise what key actions should be recommended within the Multi-Year Action Plan. These included:

- The creation and nurturing of a multi-stakeholder cross-border ecosystem
- The development and implementation of digital-health-focused curriculum
- The expansion of gatherings catering to improved awareness and visibility of digital health initiatives
- Further stakeholder mapping activities - with a particular emphasis on those with connections to governmental bodies
- The creation of a knowledge-sharing database and/or marketplace

This comprehensive approach aimed to gain a deep understanding of stakeholder perspectives and how different groups influence each other in the subject matter. The gathered insights were used to verify and validate priorities, challenges, and opportunities, ultimately leading to a shared vision for the future with actionable steps for achieving an optimal digital health landscape.

5. Multi-Year Action Plan Development and Implementation

5.1 Current Landscape and Assumptions

The current landscape of digital health innovation presents a mix of exciting possibilities and hurdles to overcome. Stakeholders across civil society, industry, academia, and government all have vested interests in shaping the future. A Multi-Year Action Plan thus must address these diverse perspectives to drive successful implementation.

One major assumption of the current reality is the potential realisation of the Common European Data Spaces[9]. If approved, this initiative could significantly boost the digital health environment. Secure and standardised data sharing across borders would unlock a wealth of information for research and development. This aligns with the anticipated EU's Horizon Europe Strategic Plan 2025-2027 for research and innovation[10], which is likely to prioritise fostering a user-centric approach and breaking down silos between sectors. In addition, the recently approved Artificial Intelligence Act[11], the continued development of Natural Language Processing (NLP) technology[12] within the healthcare domain, among other advancements can, and *will*, influence the evolution of digital health advancement and implementation overall.

Beyond the data space, other big factors will influence the EU's digital health strategy and related policies. Public trust in data privacy and security remains paramount. Regulations need to be seen as enablers, not barriers, to innovation. Policies that encourage collaboration between academia, industry, and the public sector will be crucial. Additionally, fostering a culture of continuous learning and upskilling the workforce will be essential to bridge the gap between technological advancements and real-world healthcare needs.

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[9] https://digital-strategy.ec.europa.eu/en/policies/data-spaces
[10] https://ec.europa.eu/commission/presscorner/detail/en/ip_24_1572

[11] https://www.europarl.europa.eu/news/en/press-room/20240308IPR19015/artificial-intelligence-act-meps-adopt-landmark-law#:~:text=On%20Wednesday%2C%20Parliament%20approved%20the,46%20against%20and%2049%20abstentions.
[12] https://digital-strategy.ec.europa.eu/en/policies/language-technologies

By acknowledging these opportunities and challenges, and following a sound methodology, the next steps for a multi-year action plan can be tailored to effectively drive digital health innovation in Europe.

5.2 Objectives and goals

The "Comprehensive Multi-Year Action Plan" (deliverable D6.1) is a strategic plan that represents a main project outcome from CONNECTINGHEALTH.

Its main objective is to help contribute to designing the best possible future for digital health in the EU and beyond, taking into account the various opportunities in this field.

The goals of this Action Plan as such are:

1. **Design the optimal future for digital health in the EU:** This overarching goal encompasses all aspects of a thriving digital health ecosystem.

2. **Outline a five-year roadmap:** This includes establishing clear objectives, activities, and a timeline for achieving them.

3. **Capitalise on opportunities in digital health:** The plan will identify and leverage promising areas for innovation and advancement.

4. **Ensure a future-proof approach:** The goals should consider the evolving digital health landscape beyond the EU.

5.3 The Proposed Action Framework

This Multi-Year Action Plan Framework presented by CONNECTINGHEALTH is a proposal outlining our strategic vision and objectives for the future of digital health in the EU for the next five years (2025-2030). While every effort has been made to ensure accuracy and feasibility, it is important to note that this document serves as a blueprint subject to change or a roadmap towards the optimal future of the digital health sector. External factors, stakeholder input, resource availability, and evolving circumstances may necessitate modifications to the proposed plan. This document does not constitute a binding commitment, and all projections, timelines, and initiatives are subject to adjustment. It can serve as a policy guideline on the European, national and regional level and will be disseminated as such. A more detailed explanation of each of the activities and deliverables proposed can be found later in this document.

Activities	Outputs
Activity 1: Creation and nurturing of one multi-stakeholder cross-border ecosystem in Europe	1. *Stakeholder Identification Report* 2. *Stakeholder Partnership Development Strategy* 3. *Government-Specific Stakeholder Mapping Exercise* 4. *Government-Specific Stakeholder Engagement Strategy* 5. *Stakeholder Engagement Workshops and Meetings* 6. *Online Collaboration Platform* 7. *Cross-Border Networking Events* 8. *Initiation of Cross-Border Projects* 9. *Best Practice Sharing Guidelines* 10. *Policy Briefs* 11. *Advocacy and Lobbying Campaigns* 12. *Stakeholder Engagement Metrics, Evaluation and Monitoring Framework*
Activity 2: Development and implementation of digital-health-focused curriculum for current healthcare students and pre-existing healthcare practitioners for European contexts which request support	1. *Development of Curriculum Framework* 2. *Development of Curriculum Modules and Lesson Plans* 3. *Digital Learning Resources* 4. *Teacher Training and Professional Development Workshops* 5. *Pilot Implementation Programs* 6. *Quality Assurance and Accreditation Guidelines* 7. *Evaluation and Assessment Tools* 8. *Community Engagement and Outreach Activities*
Activity 3: Roll-out and expansion of gatherings that improves awareness and visibility of digital health initiatives	1. *Event Speaker Recruitment and Program Development* 2. *Event Planning and Logistics* 3. *Marketing and Promotional Materials* 4. *Participant Registration and Engagement* 5. *Content Creation and Documentation* 6. *Evaluation and Impact Assessment.* 7. *Sustainability and Scaling Strategies* 8. *Continuous Improvement and Iteration*

Activity 4:	
Activity 4: Creation of a knowledge-sharing database and/or open marketplace Europe wide for cross sectoral, multi-stakeholder use *(i.e., for industry to find funds/testers/etc., for academia to have their innovations uptaken by industry, for civil society to be included in consultations at initial innovation phases, for the government to support with enabling policies, etc.)*	1. *Database Design and Architecture* 2. *Content Curation and Aggregation* 3. *User Interface and Experience Design* 4. *Platform Development and Implementation* 5. *Quality Assurance and Testing* 6. *Community Engagement and Onboarding:* 7. *Monitoring and Analytics Tools* 8. *Governance and Moderation Policies*

Figure 6. CONNECTINGHEALTH Multi-Year Action Plan Framework Main Activities & Output

In continuation of Figure 6, the four main activities and outputs are described in more depth below, with a SMART-goals lens applied, taking into account the relevant stakeholders which could be involved, and approximate timelines with respect to a short-, medium-, and long-term calendar over the five years ahead. Note that the outputs listed are suggestions, and not all need to be undertaken for activity success, however, in providing the most holistic approach to action plan success, these suggested outputs act as a roadmap for potential next steps.

> **Activity 1:** *Creation and nurturing of one multi-stakeholder cross-border ecosystem in Europe*

By the end of the first year of our suggested Multi-Year Action Plan launching, Activity 1 will aim to have successfully established and cultivated a diverse multi-stakeholder cross-border ecosystem. This ecosystem will actively engage stakeholders from various sectors, including government bodies, industry associations, academia, NGOs, financial institutions, technology hubs, civil society groups, and media channels. Through targeted outreach, collaboration initiatives, and knowledge exchange programs, the ecosystem will foster partnerships, drive innovation, and facilitate the sharing of best practices across European borders. The goal is to create a dynamic and sustainable ecosystem that accelerates the adoption and implementation of digital health solutions, ultimately improving healthcare outcomes and promoting innovation-led economic growth throughout Europe.

- **Relevant stakeholders:**

    - **Allocated project management team**
        - For coordination, progression and maintenance of activity.

    - **ECHAlliance Communities Team**
        - Responsible for overseeing ECHAlliance's global membership and ecosystem community, involving suitable members and regional or thematic ecosystems.

    - **Stakeholder representation from industry, government, academia, and civil society**
        - Seek broad representation from all European countries or regions throughout all activities.

    - **Government agencies**
        - Government bodies are crucial for policy creation supporting cross-border collaboration. Involving reps from relevant ministries, trade departments, and diplomatic offices aids coordination and ecosystem development.

    - **Industry associations**

- Industry associations and chambers aid cross-border businesses by providing networking, advocacy, and expertise to foster collaboration and remove trade barriers.

- **Businesses and corporations**
  - Involving multinationals, SMEs, start-ups, and other businesses is vital for a thriving cross-border ecosystem. They offer expertise, resources, and market access, driving innovation, job creation, and economic growth.

- **Academic and research institutions**
  - Academia fosters cross-border collaboration via knowledge exchange, research partnerships, and talent development. Involving universities promotes innovation, technology transfer, and research commercialisation within the ecosystem.

- **Non-governmental organisations (NGOs)**
  - NGOs in sustainable development, humanitarian aid, and social entrepreneurship address cross-border challenges. Their expertise in community engagement, capacity building, and advocacy complements other stakeholders' efforts.

- **Financial institutions and investors**
  - Financial institutions and investors provide crucial funding for cross-border ventures. Engaging them attracts investment, facilitates capital flows, and mitigates financial risks.

- **Technology and innovation hubs**
  - Tech hubs foster entrepreneurship, innovation, and knowledge exchange. They offer infrastructure, mentorship, and networking, catalysing cross-border collaboration in emerging industries within health innovation.

- **Civil society and community groups**
  - Involving civil society, community groups, and grassroots movements ensures the cross-border ecosystem meets local needs. They offer insights, grassroots support, and social capital for initiatives in cultural exchange, social inclusion, and sustainable development.

- o **Media and communication channels**
    - ■ Using media, digital platforms, and communication channels is vital for awareness and collaboration in cross-border initiatives. Involving journalists, influencers, and communication pros amplifies efforts and widens the audience reach.

- **Potential output descriptions:**

  - o **Stakeholder Identification Report**
    - ■ Produce one stakeholder identification report (considering the digital health innovation space in Europe) detailing key stakeholders' roles, interests, influence, and potential contributions at regional, national, and EU levels.

  - o **Stakeholder Partnership Development Strategy**
    - ■ Develop a stakeholder partnership strategy to engage champions for the cause within national borders and across Europe, ensuring regional coverage. This strategy outlines outreach plans, collaboration frameworks, and engagement mechanisms to foster cross-border collaboration among stakeholders within the Quadruple Helix Model.

  - o **Government-Specific Stakeholder Mapping Exercise**
    - ■ Perform a targeted stakeholder mapping exercise focusing solely on government entities at both national and regional levels. This exercise aims to identify and categorise key governmental stakeholders relevant to the project's objectives, providing valuable insights into their roles, interests, and potential contributions.

  - o **Government-Specific Stakeholder Engagement Strategy**
    - ■ Develop a tailored stakeholder engagement strategy specifically designed to effectively engage governmental entities at national and regional levels. This strategy outlines approaches, tactics, and communication channels to foster meaningful dialogue, collaboration, and partnership with government stakeholders, aligning with activity objectives and priorities.

o **Stakeholder Engagement Workshops and Meetings**

  ■ Organise various stakeholder workshops and meetings to facilitate dialogue, collaboration, and relationship-building with and amongst governmental stakeholders. These sessions provide opportunities for sharing insights, gathering feedback, and contributing to project planning and implementation.

o **Online Collaboration Platform**

  ■ Create an online collaboration platform to facilitate ongoing communication, information sharing, and collaboration among stakeholders. The platform may include discussion forums, resource libraries, project directories, and networking tools to support cross-border initiatives and partnerships.

o **Cross-Border Networking Events**

  ■ Organise cross-border networking events to unite stakeholders from various countries and sectors, fostering knowledge exchange, relationship-building, and collaboration exploration. These events aim to facilitate meaningful interactions and foster cross-border partnerships.

o **Initiation of Cross-Border Projects**

  ■ Initiate cross-border projects addressing common challenges identified in the outputs of the CONNECTINGHEALTH project. Leveraging complementary strengths and promoting shared goals among stakeholders, these projects may focus on research collaboration, innovation exchange, or policy advocacy to advance the cross-border ecosystem.

o **Best Practice Sharing Guidelines**

  ■ Develop best practice sharing guidelines derived from successful cross-border collaboration initiatives. These resources aid stakeholders in replicating successful models, avoiding common pitfalls, and enhancing the overall effectiveness of their cross-border engagement efforts.

- o **Policy Briefs**
  - To advocate for supportive policies, regulations, and funding mechanisms that facilitate cross-border collaboration and innovation. These briefs should highlight the benefits of cross-border ecosystems and provide recommendations for policymakers at the national and EU levels.

- o **Advocacy and Lobbying Campaigns**
  - Create policy briefs advocating for supportive policies, regulations, and funding mechanisms that facilitate cross-border collaboration and innovation. These briefs highlight the benefits of cross-border ecosystems and offer recommendations for policymakers at national and EU levels.

- o **Stakeholder Engagement Metrics, Evaluation and Monitoring Framework**
  - Develop a Stakeholder Engagement Metrics and Monitoring Framework to measure the effectiveness and impact of engagement activities with governmental stakeholders. Define key performance indicators and metrics, track and evaluate stakeholder engagement to assess progress, identify areas for improvement, and demonstrate project outcomes.

- **Timelines:**

  - o **Short-Term Actions:**

    - **Stakeholder Identification Report:** Begin gathering initial data on key stakeholders, their roles, and interests through desk research and preliminary outreach.

    - **Stakeholder Engagement Workshops and Meetings**: Organise initial stakeholder engagement sessions to gather insights, feedback, and input for the identification report.

    - **Online Collaboration Platform:** Start the development process for the online collaboration platform by outlining basic requirements and functionalities based on initial stakeholder needs assessment.

- **Cross-Border Networking Events:** Plan and schedule the first series of cross-border networking events to kickstart relationship-building among stakeholders.

o **Medium-Term Actions:**

- **Stakeholder Partnership Development Strategy:** Develop a comprehensive strategy for fostering partnerships with key stakeholders, including detailed outreach plans and collaboration frameworks.

- **Government-Specific Stakeholder Mapping Exercise:** Conduct a thorough mapping exercise to identify and categorise government-specific stakeholders, their roles, and potential contributions.

- **Best Practice Sharing Guidelines:** Create guidelines for sharing best practices, drawing from insights gathered from initial stakeholder engagement activities.

- **Policy Briefs:** Begin drafting policy briefs advocating for supportive policies and regulations for digital health, based on initial research and stakeholder input.

o **Long-Term Actions:**

- **Government-Specific Stakeholder Engagement Strategy:** Implement a tailored engagement strategy for government stakeholders, incorporating insights from the stakeholder mapping exercise and ongoing feedback.

- **Initiation of Cross-Border Projects:** Launch pilot cross-border projects based on identified common challenges and stakeholder interests, leveraging insights from stakeholder engagement and networking events.

- **Advocacy and Lobbying Campaigns:** Roll out advocacy campaigns to promote supportive policies and regulations, leveraging policy briefs and stakeholder partnerships.

- ■ **Stakeholder Engagement Metrics, Evaluation and Monitoring Framework:** Develop a robust framework for evaluating stakeholder engagement efforts, incorporating metrics and mechanisms for ongoing monitoring and improvement.

Activity 2: *Development and implementation of digital-health-focused curriculum for current healthcare students and pre-existing healthcare practitioners for European contexts which request support*

By the end of the second year of our proposed Multi-Year Action Plan, Activity 2 aims to develop and implement the framework of a comprehensive digital-health-focused curriculum tailored for current healthcare students and pre-existing healthcare practitioners which could fit the needs of European contexts requesting support. The goal is to equip healthcare professionals with the necessary knowledge, skills, and competencies to effectively manage digital transformations in the workplace and leverage digital health technologies in their practice. This curriculum will be designed to address the specific needs and challenges of healthcare delivery in diverse European settings, emphasising best practices, evidence-based approaches, and ethical considerations, and can be ideally used as is or further adapted based on specific needs. Through strategic partnerships with academic institutions, healthcare organisations, and industry experts, we aim to ensure the widespread adoption and integration of digital health education across European healthcare systems, ultimately enhancing patient care, improving health outcomes, and driving innovation in the field of digital health throughout Europe.

- ● **Relevant stakeholders:**
  - ○ **Project management team**
    - ■ For coordination, progression and maintenance of activity
  - ○ **ECHAlliance Communities Team**
    - ■ To involve suitable ECHAlliance members and ecosystems
  - ○ **Government and education authorities**

- Government and education authorities, at both national and regional levels, must be engaged to provide support, guidance, and regulatory oversight. They may also allocate funding and resources for curriculum development and implementation.

- **Educational Institutions**

  - Educational institutions, including schools, colleges, and universities, play a vital role in integrating the digital-health curriculum into existing educational programs. Principals, teachers, and administrators must be involved in curriculum design, implementation, and evaluation.

- **Healthcare professionals**

  - Engaging healthcare professionals, including doctors, nurses, psychologists, and public health experts, is crucial for providing accurate health information. They contribute expertise to curriculum development and participate in guest lectures or workshops.

- **Digital health and technology experts**

  - Digital health and technology experts, such as software developers, data analysts, and cybersecurity specialists, offer insights into the latest digital tools for health education. Their input ensures the curriculum includes practical skills for utilising technology in health promotion and management.

- **Students and student associations**

  - Student involvement is crucial for curriculum development. Consulting with student councils or representative groups provides valuable insights into their interests, needs, and preferences for digital-health education.

- **Community organisations**

  - Collaborating with community organisations, like health advocacy groups and local healthcare providers, extends the curriculum's reach beyond school. They promote health literacy and reinforce learning through community-based activities.

- o **Industry partners**

  - ▪ Partnering with technology firms, digital health start-ups, and industry stakeholders provides resources, expertise, and real-world case studies. They may also offer internships, mentorships, or sponsorships to support student learning.

- o **Researchers and academics**

  - ▪ Engaging researchers and academics in education, public health, and technology fields provides evidence-based insights for curriculum development and evaluation. Their research informs content and teaching methods.

- o **Regulatory bodies**

  - ▪ Consulting regulatory bodies overseeing education standards ensures compliance with regulations and guidelines, meeting educational objectives and quality standards for the digital-health curriculum.

- **Potential output descriptions:**

  - o **Development of Curriculum Framework**

    - ▪ Create a robust curriculum framework for digital health education, defining scope, objectives, and structure. This framework outlines key learning outcomes, core competencies, and thematic areas to be covered, ensuring comprehensive educational content.

  - o **Development of Curriculum Modules and Lesson Plans**

    - ▪ Develop modular curriculum and lesson plans for digital health education across Europe. Each module includes learning objectives, instructional materials, activities, and assessments tailored to diverse audiences, enabling easy adoption or customisation for various educational contexts.

  - o **Digital Learning Resources**

- Create digital learning resources, including e-books, videos, interactive simulations, and online courses, to enhance traditional classroom instruction. Accessible through digital platforms, these resources accommodate various learning styles and preferences.

o **Teacher Training and Professional Development Workshops**

- Organise teacher training workshops to equip educators with the knowledge, skills, and resources for effective delivery of the digital-health curriculum. These sessions cover pedagogical approaches, instructional strategies, and technology integration methods.

o **Pilot Implementation Programs**

- Implement pilot programs in schools, universities, or healthcare settings to test the digital-health curriculum's effectiveness. Collect feedback from students, teachers, and stakeholders to evaluate its impact and identify areas for improvement.

o **Quality Assurance and Accreditation Guidelines**

- Establish quality assurance and accreditation guidelines for digital-health educational programs, ensuring alignment with industry standards and regulatory requirements.

o **Evaluation and Assessment Tools**

- Create evaluation and assessment tools to measure student learning outcomes, knowledge retention, and skill acquisition in digital health concepts. These tools include quizzes, exams, performance assessments, and surveys to assess the curriculum's effectiveness.

o **Community Engagement and Outreach Activities**

- Engage stakeholders, including parents, healthcare professionals, industry partners, and community organisations, in developing and implementing the digital-health curriculum. Organise outreach activities, seminars, and awareness campaigns to promote the curriculum and garner community support.

- **Timelines:**

  - **Short-Term Actions:**

    - **Development of Curriculum Framework:** Initiate the development process by convening a team to outline the scope, objectives, and structure of the curriculum framework.

    - **Community Engagement and Outreach Activities:** Begin planning and organising outreach activities to engage stakeholders, raise awareness, and gather input for curriculum development.

    - **Teacher Training and Professional Development Workshops:** Schedule and conduct initial training sessions for educators to introduce them to the digital-health curriculum objectives and pedagogical approaches.

    - **Digital Learning Resources:** Identify existing digital resources and begin compiling a repository of materials to supplement curriculum development.

  - **Medium-Term Actions:**

    - **Development of Curriculum Modules and Lesson Plans:** Create detailed modules and lesson plans for different topics within the curriculum, incorporating feedback from educators and stakeholders.

    - **Quality Assurance and Accreditation Guidelines:** Establish quality assurance standards and accreditation guidelines, ensuring alignment with educational best practices and industry standards.

    - **Evaluation and Assessment Tools:** Develop evaluation criteria and assessment tools to measure student learning outcomes and the effectiveness of the curriculum.

    - **Pilot Implementation Programs:** Implement pilot programs in select educational institutions to test the effectiveness of the curriculum and gather feedback for refinement.

- o **Long-Term Actions:**

    - **Community Engagement and Outreach Activities:** Continue and expand community engagement efforts to maintain stakeholder involvement and support for the curriculum.

    - **Digital Learning Resources:** Develop additional digital learning resources, such as e-books, videos, and online courses, to enhance the curriculum's accessibility and effectiveness.

    - **Teacher Training and Professional Development Workshops:** Conduct ongoing training and professional development workshops for educators to ensure they are equipped to deliver the curriculum effectively.

    - **Evaluation and Assessment Tools:** Refine and improve evaluation and assessment tools based on feedback and data collected from pilot implementations and ongoing evaluations.

> **Activity 3:** *Roll-out and expansion of gatherings that improves awareness and visibility of digital health initiatives*

Year two onwards of the proposed Multi-Year Action Plan, Activity 3 aims to successfully roll out and expand gatherings that enhance awareness and visibility of digital health initiatives across the region. The goal is to establish a series of high-impact events, including conferences, workshops, seminars, and webinars, which serve as platforms for knowledge exchange, networking, and collaboration among stakeholders in the digital health ecosystem. These gatherings will bring together key players from government agencies, healthcare institutions, industry partners, academia, NGOs, and civil society groups to showcase innovative solutions, share best practices, and foster partnerships that drive digital health transformation in Europe. Through targeted marketing, strategic partnerships, and stakeholder engagement efforts, we aim to increase participation, diversity, and impact of these gatherings, ultimately raising awareness, building momentum, and catalysing action towards achieving our overarching goal of advancing digital health innovation and improving healthcare outcomes across Europe.

- **Relevant stakeholders:**

  o **Project management team**

    ▪ For coordination, progression and maintenance of activity

  o **ECHAlliance Communities Team**

    ▪ To involve suitable ECHAlliance members and ecosystems

  o **Government health departments**

    ▪ National and local health departments can support digital health gatherings by providing funding, logistical support, and expertise. They ensure alignment with public health priorities and policies.

  o **Healthcare providers and professionals**

    ▪ Involving healthcare providers, including doctors, nurses, pharmacists, and allied health professionals, is crucial for promoting digital health initiatives and fostering collaboration. They offer insights on implementing digital health technologies and contribute to educational sessions and workshops.

  o **Technology companies and start-ups**

    ▪ Tech companies specialising in digital health solutions, such as telemedicine platforms, health apps, wearables, and health IT systems, play a pivotal role in promoting awareness and adoption. They showcase products, share case studies, and provide demonstrations at gatherings to highlight benefits.

  o **Patient advocacy groups**

    ▪ Patient advocacy groups represent patient interests and advocate for digital health solutions improving outcomes and experiences. Involving them in gatherings ensures patient perspectives and needs are prioritised.

  o **Academic and research institutions**

- Engaging academic stakeholders from universities, research centres, and networks facilitates research dissemination, best practices sharing, and collaboration with industry. This enhances digital health advancement through gatherings.

o **Regulatory agencies**

- Involving regulatory agencies in gatherings is crucial for ensuring patient safety, data privacy, and regulatory compliance in digital health initiatives. It allows for discussions on regulatory challenges, updates, and guidelines.

o **Health insurance companies and payers**

- Engaging insurers in gatherings allows discussions on reimbursement policies, coverage criteria, and incentives for digital health adoption, aligning with their interest in improving outcomes and reducing costs.

o **Professional associations and societies**

- Professional associations and societies in healthcare disciplines, like medical and nursing associations, serve as important partners in organising and endorsing gatherings. They facilitate knowledge sharing, networking, and professional development for members.

o **Community organisations and non-governmental organisations**

- Community organisations and grassroots initiatives promote health awareness and literacy within communities. Engaging them in gatherings ensures culturally sensitive, accessible, and inclusive digital health initiatives.

o **Media and communication channels**

- Utilising media outlets and social platforms promotes awareness of digital health gatherings. Engaging journalists and influencers amplifies their reach, attracting diverse audiences and stakeholders.

- **Potential output descriptions:**

  o **Event Speaker Recruitment and Program Development**

    - Recruit keynote speakers, panellists, and workshop facilitators with expertise in digital health innovation, policy, research, and practise for events. Collaborate with stakeholders to design an engaging and informative program covering diverse topics relevant to digital health initiatives.

  o **Event Planning and Logistics**

    - Create a comprehensive event plan detailing objectives, agenda, format, venue, date, and logistics. Consider accommodating both in-person and virtual attendees, and include arrangements for audiovisual equipment, catering, and transportation.

  o **Marketing and Promotional Materials**

    - Develop marketing materials, including flyers, brochures, posters, social media graphics, and email campaigns, to promote the gatherings. Craft compelling messaging highlighting the value proposition, benefits, and unique selling points of attending the events.

  o **Participant Registration and Engagement**

    - Implement an online registration system and platform for gathering participants to register and access event-related information, resources, and updates. Develop strategies for engaging participants before, during, and after the gatherings, including interactive sessions, networking opportunities, and feedback mechanisms.

  o **Content Creation and Documentation**

    - Create comprehensive content and documentation to capture insights, discussions, and outcomes from the gatherings. This involves recording video presentations, taking session notes, conducting participant surveys, and producing post-event reports for dissemination.

  o **Evaluation and Impact Assessment**

■ Create evaluation criteria and tools to measure the effectiveness, impact, and satisfaction of the gatherings among participants and stakeholders. Collect feedback on content relevance, speaker quality, networking, and overall experience to assess the events comprehensively.

o **Sustainability and Scaling Strategies**

■ Develop sustainability and scaling strategies to extend the impact of the gatherings beyond the initial phase. This includes identifying funding sources, partnerships, and collaborative arrangements with organisations interested in hosting similar events or supporting ongoing awareness efforts.

o **Continuous Improvement and Iteration**

■ Establish mechanisms for ongoing monitoring, evaluation, and iteration to continuously improve the quality, relevance, and impact of the gatherings over time. Solicit feedback from participants, stakeholders, and organisers to identify areas for enhancement and innovation in future iterations of the events.

● **Timelines:**

o **Short-Term Actions:**

■ **Event Planning and Logistics:** Secure a venue, set a date, and establish basic logistical arrangements for the first event.

■ **Marketing and Promotional Materials:** Begin designing and creating marketing materials such as flyers, posters, and social media graphics to promote the event.

o

■ **Participant Registration and Engagement:** Set up an online registration system for participants to register for the event and start promoting registration through various channels.

- **Content Creation and Documentation:** Start documenting the event planning process and create a preliminary outline for the event program.

o **Medium-Term Actions:**

- **Event Speaker Recruitment and Program Development:** Reach out to potential speakers and finalise the event program based on their availability and topics of expertise.

- **Participant Registration and Engagement:** Launch a targeted outreach campaign to encourage more registrations and engage registered participants with event updates and reminders.

- **Content Creation and Documentation:** Develop detailed content for presentations, panels, and workshops, and establish a plan for capturing key insights and outcomes during the event.

- **Evaluation and Impact Assessment:** Develop a framework for evaluating the event's impact and effectiveness in achieving its objectives.

o **Long-Term Actions:**

- **Sustainability and Scaling Strategies:** Explore opportunities to secure long-term funding and partnerships to sustain and expand the event series beyond the initial phase.

  o

- **Continuous Improvement and Iteration:** Gather feedback from participants and stakeholders to identify areas for improvement and innovation in future iterations of the event series.

- **Event Planning and Logistics:** Streamline event planning processes and logistics based on lessons learned from previous events to improve efficiency and effectiveness.

- **Marketing and Promotional Materials:** Develop a comprehensive marketing strategy for promoting future events and reaching a broader audience.

> **Activity 4:** *Creation of a knowledge-sharing database and/or open marketplace Europe wide for cross sectoral, multi-stakeholder use*

Starting development year two onwards, and completing by the end of the fifth year of the proposed Multi-Year Action, Activity 4 aims to establish a comprehensive knowledge-sharing database and/or open marketplace accessible Europe-wide for cross-sectoral, multi-stakeholder use. The goal is to create a centralised platform that facilitates the exchange of expertise, resources, and best practices among diverse stakeholders in the digital health ecosystem. This platform will serve as a repository of valuable insights, case studies, research findings, and practical tools related to digital health innovation, enabling stakeholders to access relevant information, collaborate on projects, and accelerate the implementation of innovative solutions across Europe. Through robust infrastructure development, stakeholder engagement strategies, and ongoing quality assurance measures, we aim to ensure the sustainability, usability, and scalability of this knowledge-sharing platform, thereby fostering collaboration, driving innovation, and improving healthcare outcomes throughout the European region.

- **Relevant stakeholders:**
  - **Project management team**
    - For coordination, progression and maintenance of activity
  - **ECHAlliance Communities Team**
    - To involve suitable ECHAlliance members and ecosystems
  - **Content contributors**
    - Content contributors, including experts, researchers, academics, practitioners, and industry professionals, enrich the database or marketplace with valuable knowledge, insights, and resources, enhancing its value to users.
  - **Users and beneficiaries**

- Users, including students, professionals, policymakers, researchers, entrepreneurs, and the public, shape the platform's design, functionality, and content through their needs, preferences, and feedback.

o **Technology providers**

- Engaging technology providers, including companies, developers, and IT professionals, ensures the platform's user-friendliness, scalability, and alignment with industry standards.

o **Industry partners and associations**

- Partnering with industry associations and relevant networks fosters collaboration, promotes knowledge exchange, and expands platform reach. Industry stakeholders offer resources, expertise, and promotional support to enhance effectiveness.

o **Government agencies and regulators**

- Engaging government agencies and regulators ensures compliance with relevant laws and regulations governing data privacy, intellectual property rights, and online transactions. It also facilitates access to public datasets, funding opportunities, and policy support.

o **Educational institutions**

- Engaging educational institutions fosters lifelong learning, professional development, and capacity-building opportunities for platform users by contributing resources, research, and expertise.

o **Non-profit organisations**

- Non-profit organisations and civil society groups promote knowledge-sharing, social impact, and community engagement. They contribute resources, networks, and advocacy support to address societal challenges and ensure inclusive access to information and opportunities.

o **Entrepreneurs and start-ups**

- Engaging entrepreneurs, start-ups, and innovators fosters innovation, incubates new ideas, and catalyses economic growth within the

knowledge-sharing ecosystem by providing access to knowledge, mentorship, and networking opportunities.

- o **Funders and investors**

  - ■ Engaging funders and investors secures resources and establishes sustainability models for the knowledge-sharing platform's long-term impact.

- o **Media and communication channels**

  - ■ Leveraging media outlets and communication channels is essential for promoting awareness and attracting users to the knowledge-sharing platform. Engaging journalists, influencers, and communication professionals enhances outreach efforts and boosts platform visibility.

- ● **Potential output descriptions:**

  - o **Database Design and Architecture**

    - ■ Design a comprehensive plan for the knowledge-sharing database or marketplace, detailing its structure, functionality, and technical specifications. Considerations include data storage, retrieval, security, and scalability to ensure an effective and robust platform.

  - o **Content Curation and Aggregation**

    - ■ Curate and aggregate relevant knowledge resources such as research articles, case studies, reports, and educational materials for the database or marketplace. Ensure accuracy, currency, and alignment with the platform's focus areas and audience.

  - o **User Interface and Experience Design**

    - ■ Design a user-friendly interface for the knowledge-sharing database or marketplace, prioritising ease of navigation and accessibility. Include advanced search filters, tagging systems, and personalised recommendations to improve user experience

  - o **Platform Development and Implementation**

- Develop and deploy the knowledge-sharing database or marketplace platform using appropriate technologies and frameworks. Implement features for content management, user registration, authentication, collaboration, and sharing to facilitate knowledge exchange and interaction among users.

- **Quality Assurance and Testing**

  - Conduct comprehensive testing and quality assurance to ensure the reliability, performance, and security of the knowledge-sharing platform. Test for usability, functionality, compatibility, and security vulnerabilities across various devices, browsers, and user scenarios.

- **Community Engagement and Onboarding**

  - Launch outreach and onboarding campaigns to attract users, contributors, and stakeholders to the knowledge-sharing platform. Provide training, resources, and support to help users navigate the platform, contribute content, and engage with the community effectively.

- **Monitoring and Analytics Tools**

  - Initiate outreach and onboarding campaigns to attract users, contributors, and stakeholders to the knowledge-sharing platform. Offer training, resources, and support to assist users in navigating the platform, contributing content, and engaging with the community efficiently.

- **Governance and Moderation Policies**

  - Establish governance and moderation policies to oversee content creation and curation on the knowledge-sharing platform. Define guidelines for user-generated content, community standards, copyright compliance, and dispute resolution to maintain quality and integrity.

- **Timelines:**

  - **Short-Term Actions:**

- **User Interface and Experience Design:** Conduct user research and surveys to understand user preferences and requirements for the platform's interface design.

- **Community Engagement and Onboarding:** Develop a plan for engaging potential users and stakeholders through outreach campaigns, social media presence, and informational materials.

- **Quality Assurance and Testing:** Begin testing the initial prototypes of the platform for usability, functionality, and compatibility with different devices and browsers.

- **Medium-Term Actions:**

  - **Database Design and Architecture:** Finalise the design and architecture plan for the knowledge-sharing platform, ensuring scalability, security, and compatibility with future enhancements.

  - **Platform Development and Implementation:** Begin development of the platform, focusing on core features such as user registration, content management, and collaboration tools.

  - **Governance and Moderation Policies:** Establish initial guidelines and policies for content creation, curation, and moderation, considering input from stakeholders and legal experts.

- **Long-Term Actions:**

  - **Content Curation and Aggregation:** Continuously curate and aggregate relevant knowledge resources to populate the platform, ensuring that the content remains up-to-date and aligned with user needs.

  - **Monitoring and Analytics Tools:** Implement monitoring and analytics tools to track user engagement, content performance, and platform usage metrics, providing insights for continuous improvement.

■ **Quality Assurance and Testing:** Conduct ongoing testing and quality assurance to identify and address any issues or bugs that arise during the platform's usage and development lifecycle.

5.4 Resource allocation and EU-specific resources

The proposed Multi-Year Action Plan serves as a roadmap for achieving a flourishing digital health future in the EU, however, resource allocation will significantly influence the plan's effectiveness in several ways:

● **Prioritisation and feasibility:** Resource limitations often dictate which activities within the plan are prioritised. Abundant funding allows for pursuing a wider range of ambitious goals, while limited resources might necessitate focusing on just a few key areas or scaling back initiatives. This directly impacts the plan's comprehensiveness and ability to address diverse aspects of digital health.

● **Depth and reach:** The amount of funding allocated determines the depth and breadth with which the plan can delve into different facets of digital health. Ample resources could enable in-depth exploration of various opportunities and challenges, while limited funds might force a more superficial approach.

● **Stakeholder engagement:** Effective stakeholder engagement is crucial for plan success, and resources play a vital role in facilitating this. Funding can support workshops, conferences, and communication materials to ensure all voices are heard, fostering collaboration and buy-in from key players.

● **Sustainability and impact:** Long-term success hinges on building a sustainable digital health cross-sector, cross-border ecosystem. Resources are needed for pilot projects, testing initiatives, and knowledge sharing. Without these, the plan's impact might be limited to the initial implementation phase and struggle to endure.

Complementary to the above, the EU possesses a toolbox of resources that can significantly impact the uptake of the proposed action plan such as:

- **Funding initiatives:** The EU offers various funding programs that support research and innovation in digital health. The action plan can leverage these resources to incentivise activities aligned with its goals. This attracts stakeholders and encourages participation in its initiatives.

- **Policy instruments:** EU policy has a powerful influence on shaping the digital health landscape. The action plan can advocate for policy changes that create an enabling environment for innovation, such as streamlined data regulations, fostering public-private partnerships, and promoting interoperability standards.

- **Knowledge sharing platforms:** The EU can utilise its knowledge sharing platforms to disseminate the action plan's recommendations and best practices across member states. This widespread knowledge sharing inspires local initiatives that complement the plan's objectives and encourages wider adoption.

With a realistic viewpoint in understanding how the influence that EU funding and resource allocation (and potential constraints) plays a role in continuing innovation in health, the CONNECTINGHEALTH Multi-Year Action Plan considers a range of potential futures in digital health: possible futures, probable futures, and preferable futures, as seen below and with consideration to the previously conducted future scenarios workshops conducted (as seen in section 4.1 of this document).

- **Possible futures:** These encompass a broader range of scenarios, some desirable and some undesirable. These can be used to identify potential risks and opportunities that the plan should address.

- **Probable futures:** These are based on current trends and projections. Understanding these helps tailor the plan's actions to address the most likely future scenarios.

- **Preferable futures:** These represent the desired outcomes outlined in the plan. By strategically allocating resources and leveraging EU initiatives, the plan can influence the trajectory towards these preferable futures.This is aligned with the preferable vision where "digital health is health" which was validated with stakeholders during the project workshops conducted in 2023.

By exploring these different future possibilities, the action plan can be more strategic, adaptable, and ultimately more effective.

Figure 7. Navigating digital health's promising horizons through future scenarios (Drew Beamer)

5.5 Risk management and mitigation

Implementing a Multi-Year Action Plan in Europe's digital health space entails specific risks to consider:

Risk	Probability and impact (L–M–H)	Mitigation strategy
Interoperability and data sharing: Standardising data formats and ensuring seamless interoperability across EU healthcare systems can be complex due to diverse national infrastructures and legacy systems.	L / H	Monitoring the developments around interoperability and data sharing and driving on the opportunities while recognising the potential drawbacks.
Changing policy and funding priorities: While during the pandemic, the digital health received a lot of attention and the development of the European Health Data Space is perceived as a major driver for the industry, the potential changing policy and funding priorities (e.g. shifting the R&D budget from research to safety and security) pose challenges and risks.	M/H	Monitoring the developments around the shifting European and national policies, especially after the elections (e.g. elections to the European Parliament, national parliamentary elections) and advocating through various alliances for not reducing the health R&D budget in the upcoming Framework Programme.
Stakeholder engagement and alignment: Varying healthcare system maturity levels as well as national and regional priorities pose challenges. Gaining public trust for digital health solutions, especially regarding privacy and security, is vital.	M/M	Continuous engagement with stakeholders on the European, national and regional levels through the various alliances and ecosystems to understand their needs and provide solutions.
Sustainability and long-term impact: Ensuring the scalability and uptake of the results in the five year perspective within the challenging policy and financial framework pose a risk to the sustainability and impact of the plan.	M/M	Monitoring the developments around the available funding and shifting priorities on the European, national and regional level and advocating for the increased resources for digital health also in WHO and other organisations.

In addition, successful execution of the action plan relies on compliance with evolving regulations, availability of advanced technologies, adequate financial resources, and active collaboration among diverse stakeholders. Disengagement or conflicts among stakeholders could impede progress and compromise the plan's effectiveness.

By implementing this risk management methodology, the CONNECTINGHEALTH project can proactively address potential obstacles and ensure the plan remains a robust and adaptable guide for shaping a positive digital health future for the EU.

5.6 Communication and dissemination plan

To ensure the CONNECTINGHEALTH Multi-Year Action Plan reaches a wide audience and gains traction, a well-defined communication and dissemination plan will be established. This plan should cover a diverse target audience, incl. policymakers, healthcare providers, industry leaders, patient organisations, academics, and also civic society.

An easily accessible website with the full plan and summaries/infographics would be proposed as a central resource. Press releases and media engagement will generate news coverage, while stakeholder workshops and conferences will provide platforms for discussion and feedback. Social media channels like X and LinkedIn and other professional / sector-relevant platforms will keep everyone updated and engaged - and could perhaps be leveraged off of the CONNECTINGHEALTH project's pre-established efforts and networks.

Figure 8. Capturing impact for maximum engagement and up-take (Juliana Romão)

Secondly, the communication plan needs to build momentum and collaboration. A strategic launch, such as a press conference or social media campaign, would ignite initial interest. Regular updates on progress, achievements, and upcoming initiatives will be crucial for maintaining engagement throughout the five years if to move forward. Collaboration with relevant organisations working in digital health (including the current CONNECTINGHEALTH project consortium) will help amplify the plan's reach and impact overall.

5.7 Monitoring and evaluation for continuous improvement

To understand progress and impact and the potential need for shifting priorities, and ensure continuous improvement and successful implementation, the Multi-Year Action Plan will require a robust monitoring and evaluation system to ensure continuous improvement and successful implementation. This monitoring framework will include the clear and measurable indicators identified for each strategic objectives outlined in the plan. Additionally, appropriate data collection methods must be chosen to gather information on the performance indicators. Going hand-in-hand with this, a regular monitoring schedule must be established to track progress at pre-determined intervals (e.g., quarterly or biannually).

6. Conclusion

In conclusion, the CONNECTINGHEALTH project stands as a pivotal initiative dedicated to fostering interconnected and inclusive innovation ecosystems across Europe, with a specific focus on maximising the value of innovation in the digital health sector. Through collaborative efforts and inclusive development processes, the project has produced a proposal for a Comprehensive Multi-Year Action Plan, serving as a vital roadmap for advancing digital health innovation and sustainable healthcare ecosystems. This strategic document not only outlines objectives and activities but also provides actionable recommendations aimed at driving meaningful change within the European healthcare landscape.

The recommendations put forth in the Action Plan, spanning activities such as the creation of multi-stakeholder ecosystems, development of digital health-focused curriculum, and roll-out of gatherings to enhance awareness and visibility, underscore the importance of collaborative efforts and strategic partnerships in realising the project's greater vision. Moreover, with a particular emphasis on stakeholder mapping activities involving governmental bodies, the Action Plan highlights the significance of engaging key decision-makers and influencers to shape policy and drive implementation efforts forward.

Moving forward, successful implementation of the Action Plan will require careful consideration of resource allocation, sustainable rollout strategies, and leveraging EU-specific resources. By adhering to these principles and embracing a collaborative approach, the CONNECTINGHEALTH project can realise its vision of shaping the optimal future for health through digital innovation and implementation, ultimately benefiting citizens across Europe and beyond.