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Health Labs4Value

Action plan of territorial Health Labs4Value - Poland

Łukasz Łukawski, MUL

1. Executive summary

The Health Labs4Value action plan is a strategic initiative designed by the Medical University of Lodz in cooperation with the Central Clinical Hospital, the aim of which is to improve the quality of medical services, increase the efficiency of the healthcare system and implement new technologies and organizational processes. The plan is a response to the key challenges facing the Polish healthcare system, including long waiting times for specialist appointments, complicated procedures, and a shortage of medical staff. It was prepared based on a SWOT analysis of the Polish system. This allowed us to identify four priority areas in which actions should be focused primarily:

1. Relieving the medical staff by promoting and supporting the implementation of innovative solutions in the field of medicine, including telemedicine
2. Reducing administrative barriers and simplifying procedures, including supporting digitization and de-papering
3. Promoting innovative organizational changes based on VHBC, e.g. the inverted pyramid of health services, which can reduce waiting time for visits to specialists.
4. International cooperation allowing the use of best practices from other countries and the development of common universal tools and procedures.

A number of key activities have been planned for the three-year period, including:

Testing innovative medical solutions in the Living Lab methodology (3 years) – conducting pilot tests of new technologies in a real environment.

Raising awareness of medical staff and students in the field of innovation and telemedicine (2 years) – training for 100 medical staff and 300 students.

Expanding the use of digital signatures in clinical hospitals (3 years) – implementing the solution in 30 hospital clinics.

Educating patients about biometric signatures (1 year) – covering 100 patients with the program.

Establishing a Think Tank for systemic changes in healthcare (2 years) – 5 publications and participation in 5 key conferences.

Building a database of good practices and organizational solutions in health (2 years) – a website with the results of the Think Tank and partners' work.

European database of innovative practices and mutual testing in Living Labs (3 years) – development of international cooperation and testing of solutions in different conditions.

Organization of international conferences and workshops (3 years) – at least 2 conferences and 4 industry events in the area of healthcare.

The above activities will allow to achieve significant results such as:

Implementation of innovative technologies in 30 hospital clinics.

Increased awareness and competences in the field of new technologies among medical staff and patients.

Increased international cooperation and exchange of knowledge between European partners.

Strengthening systemic changes in healthcare through the activities of the Think Tank.
The implementation of the action plan will ensure lasting changes in the healthcare system, enabling effective use of new technologies and pro-organizational on a national and European scale.

2. Introduction

2.1. Brief overview of Health Labs4Value initiative

The **Health Labs4Value** initiative covers six Central European countries: Austria, Czechia, Germany, Hungary, Poland, and Slovenia. Its goal is to improve healthcare systems through innovation, collaboration, and knowledge sharing. It fosters cooperation between academia, healthcare providers, startups, industry leaders, and public institutions to create a modern and sustainable healthcare ecosystem.
The project is based on the **"Living Labs"** methodology, establishing decentralized centers in each participating country to test innovations in real-world conditions. These open, user-centered ecosystems integrate research with citizens' daily lives, enabling the co-creation and testing of new solutions. By operating in diverse social environments, they offer a flexible approach to healthcare innovation, supporting rapid prototyping, user feedback analysis, and scaling of successful solutions.

2.2. Purpose and scope of the action plan

Developing an Action Plan for a Polish regional Living Lab is essential as it structures the implementation process by defining goals, stages, tasks, and a timeline. This ensures coherent actions and efficient collaboration between universities, healthcare institutions, startups, authorities, and patients. The plan also optimizes resource management, including funding, by identifying potential support sources and partnerships. A well-prepared document facilitates integration with the European Living Labs network, providing access to international funds and expert knowledge. Defined success indicators enable progress tracking and effectiveness assessment, allowing for necessary adjustments. Additionally, an Action Plan enhances project credibility, making it easier to gain support from decision-makers and stakeholders. It is a key document that boosts efficiency, effectiveness, and scalability of healthcare innovations.

3. Local context analysis

3.1. Current healthcare landscape

The Polish healthcare system is public and based on an insurance model. Its main payer is the National Health Fund (NFZ), which contracts medical services with healthcare facilities, and financing comes from mandatory health contributions paid by citizens as well as from the state budget. The health contribution is 9% of gross income, with additional support from local governments, European funds, and private medical services. The system includes public healthcare facilities such as hospitals, clinics, specialist centers, and family doctors, who serve as the first point of contact and refer patients to specialists. These services are available free of charge for insured individuals. Private healthcare facilities offer paid services and health subscription plans, which enable quicker access to specialists.

The benefits of the system include the availability of free medical care for insured individuals, a wide network of facilities, drug reimbursements, and special care for groups such as children, pregnant women, and seniors. On the other hand, drawbacks include long waiting times for specialists, especially for planned procedures, a shortage of medical personnel, bureaucracy, and uneven access to services depending on the region. As a result, more and more patients are turning to private healthcare services, which shorten the waiting times for treatment.

3.2. Key challenges and opportunities

The Polish healthcare system faces significant challenges, including a shortage of medical personnel, long waiting times for services, an aging population, underfunding, excessive bureaucracy, and unequal access to healthcare between cities and smaller towns. The lack of medical staff leads to overburdened doctors and nurses, further extending waiting times for treatment. The growing number of seniors increases the demand for geriatric care and chronic disease treatment, while limited financial resources hinder the development of medical infrastructure and salaries in the healthcare sector.

At the same time, there are key opportunities for improvement. The development of telemedicine and digitalization, including e-prescriptions and teleconsultations, can streamline diagnostics and treatment. Investments in modern medical technologies, such as artificial intelligence and robotics, will enhance healthcare efficiency. Planned increases in healthcare funding, along with EU financial support, may improve service quality and working conditions for medical staff. Strengthening preventive healthcare could reduce the system's burden of treating chronic diseases. Better cooperation between the public and private sectors, along with reforms in medical education, may help shorten waiting times and increase the number of specialists. In the coming years, the effective implementation of reforms and investment in modern solutions will determine the quality and accessibility of healthcare in Poland

3.3. SWOT analysis

STRENGHTS	WEAKNESSES
Universal, free access to health care for insured people	Long queues for medical specialists and medical procedures
Development of telemedicine and digitalization, such as e-prescriptions and e-referrals	Shortage of medical staff
Highly qualified medical staff	Inequalities in access to health care between residents of large cities and residents of rural areas and small towns
Increasing financial expenditure on health care in the last few years	Excessive bureaucracy and complicated administrative procedures
Improving quality of medical infrastructure	Too little emphasis on health prevention

OPPORTUNITIES	THREATS
Dynamic technological development also in the fields of medicine	Lack of political stability and continuation of system reforms
Digital and communication revolution facilitating data flow	An aging society causing an increase in patients requiring the care of many specialists
Possibilities of cooperation within the European Union influencing the joint development of new solutions	Global political and economic situation
Better cooperation between public and private entities	Aging medical staff in many specialties

4. Pilot experience

4.1. Brief summary of the pilot activity

The Polish pilot initiative, conducted as part of the Health Labs4Value project, focused on testing a digital solution designed to streamline the process of signing medical documentation by patients in real-world clinical settings. The pilot was implemented at the Central Clinical Hospital in Łódź, within the framework of the Territorial Living Health Laboratories, and was guided by the Living Lab methodology. This approach emphasizes co-creation, iterative testing, and active stakeholder engagement throughout the innovation lifecycle—from concept development to implementation.

The pilot aimed to address the growing need for digitization in healthcare, particularly in the context of patient-centered care and value-based healthcare delivery. Two complementary technologies were tested: a biometric signature system using tablets and a digital IC Pen. The tablet-based solution enabled patients to sign documents electronically, with the system capturing biometric metadata such as pressure, speed, and acceleration. These parameters enhanced the security and legal credibility of the signature. The IC Pen, on the other hand, allowed patients to sign printed documents in a traditional manner, while simultaneously capturing biometric data via an embedded camera and transferring it to the hospital's Health Information System (HIS).

The pilot began with a thorough needs assessment involving key stakeholders, including patients, caregivers, healthcare professionals, IT staff, and administrative personnel. Open Innovation Camps were organized to identify local challenges and collaboratively design solutions tailored to the hospital's operational context. Twenty patients from the Clinic of Chronic Cardiovascular and Metabolic Diseases were recruited to participate in the pilot. The testing process included a pre-test phase using standardized PREM and PROM questionnaires, followed by real-world interaction with the devices during patient registration and clinical procedures, and concluded with a post-test evaluation.

Throughout the pilot, data were securely stored in the HIS, ensuring compliance with data protection regulations. Medical staff were trained to support patients in using the devices, particularly elderly individuals or those with limited digital literacy. The pilot also included technical support mechanisms to address any operational issues, such as device malfunctions or software integration challenges.

The results of the pilot demonstrated several key benefits. Patients reported increased convenience and satisfaction, particularly due to the elimination of paper-based forms and the ability to complete documentation directly during clinical encounters. Healthcare professionals noted improvements in workflow efficiency and data accessibility, although some challenges were identified, such as slower patient intake due to the need for real-time documentation and occasional technical glitches with device synchronization.

Overall, the pilot provided a robust foundation for scaling the solution across other healthcare units. It validated the Living Lab methodology as an effective framework for healthcare innovation, demonstrating that early and continuous stakeholder involvement, adaptive design, and real-world testing significantly enhance the relevance, usability, and acceptance of digital health solutions. The insights gained from this pilot will inform future implementation strategies, including training programs, technical refinements, and integration with broader hospital systems.

4.2. Experience gaind from the pilot activity

The pilot activity provided valuable insights into both the technical and organizational dimensions of implementing digital solutions in healthcare. The experience gained during the pilot confirmed the importance of engaging diverse stakeholder groups—including patients, caregivers, healthcare professionals, IT specialists, and administrative staff—from the earliest stages of development.

One of the key lessons learned was the critical role of targeted recruitment and structured onboarding. The pilot demonstrated that clear communication and hands-on support were sufficient to ensure engagement and compliance.

From a process perspective, the pilot highlighted the value of integrating feedback mechanisms at multiple levels. Patient-reported experience measures (PREM) and outcome measures (PROM) were collected before and after the intervention, providing quantitative insights into satisfaction, usability, and perceived benefits. In addition, qualitative feedback from staff revealed operational challenges, such as slower patient intake due to real-time documentation requirements, cursor displacement on stationary tablets, and delays in generating printed documents using the IC Pen. These issues were addressed through technical adjustments, including PIN-based authorization, improved device synchronization, and optimization of printing protocols.

The pilot also underscored the importance of legal and regulatory considerations. Although the biometric signature technology complies with European standards, national legislation regarding the legal validity of electronic signatures in medical documentation remains ambiguous. This prompted further dialogue with legal experts and software providers to ensure compliance and future-proofing of the solution.

Organizationally, the pilot demonstrated that digital transformation in healthcare requires not only technological innovation but also cultural and procedural adaptation. The Living Lab approach facilitated cross-functional collaboration, enabling clinical, administrative, and technical teams to work together in refining the solution. Iterative testing and shared evaluation workshops fostered a collective sense of responsibility and accelerated the pace of innovation.

Ultimately, the pilot validated the potential of biometric and hybrid digital signature solutions to enhance patient care, streamline administrative workflows, and reduce operational costs. It also revealed the need for scalable implementation strategies, including comprehensive training programs, robust technical support, and continuous monitoring. The insights gained will inform

future deployments, ensuring that digital tools are not only technically sound but also aligned with the real-world needs of healthcare providers and patients.

4.3. Impact of the pilot activity on the action plan

The pilot activity conducted at the Central Clinical Hospital in Łódź had a significant and multidimensional impact on the development and refinement of the Territorial Polish HL4V Action Plan. While the initial strategic framework was based on a SWOT analysis and predefined priorities, the real-world testing of biometric and hybrid digital signature solutions provided essential empirical evidence that shaped the operational and implementation aspects of the plan.

One of the most direct influences was the validation of the Living Lab methodology as a practical and scalable approach to healthcare innovation. The pilot confirmed that real-world testing environments, combined with structured stakeholder engagement, are not only feasible but also highly effective in identifying context-specific challenges and opportunities. This insight reinforced the decision to embed Living Lab-based testing as a core mechanism for evaluating future medical technologies within the three-year action plan. The pilot revealed specific technical and organizational requirements—such as staff training, system integration protocols, and patient education strategies—that were subsequently incorporated into the implementation roadmap. These refinements ensured that the action plan moved beyond conceptual ambition to include actionable, evidence-based steps. Moreover, the pilot highlighted the importance of patient and staff readiness, which directly influenced the inclusion of targeted educational initiatives in the action plan.

The pilot also contributed to the risk assessment and mitigation strategies outlined in the action plan. Specific challenges encountered—such as system integration issues, legal uncertainties regarding electronic signatures, and usability concerns among certain patient groups—were translated into concrete risk categories. Corresponding mitigation measures, including early legal consultation, adaptive design, and continuous technical support, were embedded into the plan to ensure resilience and responsiveness during implementation.

In addition, the pilot's outcomes influenced the definition of key performance indicators (KPIs) used to monitor progress and impact. Metrics such as adoption rates, reduction in paper documentation, and user satisfaction were calibrated based on pilot data, allowing for realistic and measurable targets. This alignment between pilot findings and evaluation frameworks enhances the credibility and effectiveness of the action plan.

Finally, the pilot strengthened the rationale for international collaboration, a core priority of the HL4V initiative. The experience demonstrated the value of cross-border knowledge exchange, particularly in addressing regulatory ambiguities and benchmarking technological solutions. As a result, the action plan places greater emphasis on integrating Polish efforts with European Living Lab networks, including shared databases, joint testing protocols, and collaborative dissemination activities.

5. Strategic objectives and priorities

5.1. Localised priorities based on regional needs

Based on the SWOT analysis of the Polish healthcare system, the following priority areas were identified:

1. Relieving the medical staff by promoting and supporting the implementation of innovative solutions in the field of medicine, including telemedicine
2. Reducing administrative barriers and simplifying procedures, including: by supporting digitization and de-papering
3. Promoting innovative organizational changes based on VHBC, e.g. the inverted pyramid of health services, which can reduce waiting times for visits to specialists.
4. International cooperation allowing the use of best practices from other countries and the development of common universal tools and procedures

5.2. Alignment with Health Labs4Value strategic objectives

Compliance with the strategic goals of Health Labs4Value:

1. Relieving the medical staff by promoting and supporting the implementation of innovative solutions in the field of medicine, including telemedicine.

This priority is in line with Health Labs4Value's goal to develop digital health solutions and improve technology adoption and support regional and international innovation ecosystems. Its goal is to optimize the processes of inpatient, outpatient and primary health care through digitization and innovative digital systems. This is a response to the local challenge related to the shortage of medical staff and long waits for visits to specialists, and at the same time contributes to the broader goal of improving the efficiency of healthcare and patient experience throughout Central Europe.

2. Reducing administrative barriers and simplifying procedures, including: by supporting digitization and de-papering

This priority is consistent with Health Labs4Value's goal of developing digital health solutions and improving technology implementation and supporting regional and international innovation ecosystems. It will also contribute to improving patient-centered care and increasing satisfaction with access and quality of care among patients, which reflects the assumptions of VBHC.

3. Promoting innovative organizational changes based on VHBC, e.g. the inverted pyramid of health services, which can reduce waiting times for visits to specialists.

This priority aligns with Health Labs4Value's goals to expand preventative health care and improve patient-centered care. It will also have a positive impact on the quality of the entire health care

system in Poland, contributing to a more effective use of financial resources. This responds to local demand for improved healthcare experiences but also contributes to the broader goal of moving towards more personalized and patient-focused care models in all participating regions.

4. International cooperation allowing the use of best practices from other countries and the development of common universal tools and procedures

This priority refers directly to one of the goals of Health Labs4Value, which is to support regional and international innovation ecosystems. It is also a direct reflection of the idea behind all project partners, as it strongly emphasizes international cooperation, knowledge exchange and the participation of various stakeholders in co-creating common universal solutions that can be implemented in various regions of Europe.

6. Proposed activities and interventions

6.1. Activities to support the implementation of Priority 1

6.1.1. Activity 1 Testing innovative medical solutions using the LivingLab methodology

Using the Regional Living Lab to test innovative medical solutions in a real clinical environment. The project will be implemented for 3 years and its goal is to test 10 innovative solutions, which may include digital technologies, medical devices or organizational and process solutions in health care.

Timeline and milestones

Year 1: Project preparation and launch

• M1: (Month 1-3) Team recruitment, development of variants of testing methodology adapted to potential reported solutions.

• M2: (Month 4-6) Establishing cooperation with companies and start-ups.

• M3: (Month 7-12) First recruitment of innovative solutions, selection of 3-4 for testing, commencement of pilot studies.

Year 2: Intensifying testing

• M4: (Month 13-18) Evaluation of the first tests, improvement of the methodology based on previous experience. Second call for solutions (another 3-4 projects).

• M5: (Month 19-24) Extension of tests to a larger group of patients, analysis of first results, iterative corrections.

Year 3: Evaluation and implementation of results

• M6: (Month 25-30) Third call for projects (last 2-3 solutions), finalization of tests of previous innovations.

• M7: (Month 31-36) Summary, final report, implementation recommendations, publication of results, implementation of selected solutions.

Staff required

•Research team: doctors, nurses, diagnosticians, physiotherapists.

•Innovation specialists: medical technology analysts, innovation managers, biostatisticians.

•IT team: system integration specialists, data analysts, programmers.

•Living Lab Coordinator: a person who supervises tests and works with partners.

•Administrative staff: legal, financial and communication services.

Hardware and financial resources

• Clinical infrastructure: testing rooms, laboratories, diagnostic equipment.

• IT technologies: data management systems, AI/ML analysis, digital patient records.

• Budget: funds for remuneration, purchase/licenses of hardware and software, clinical analyses, organization of training and conferences

Assumed results and impact

• Results:

o Testing 10 innovative medical solutions.

o Publication of evaluation reports and scientific articles.

o Implementation of at least 3 solutions to the system.

• Impact:

o Improving the quality of medical care thanks to new technologies.

o Increasing the competitiveness of the Medical University of Lodz in the area of innovation.

o Increase in the number of partnerships with the private sector.

Key Success Indicators (KPIs)

• Number of solutions submitted and tested (≥10).

• Number of solutions implemented in clinical practice (≥3).

• Number of scientific publications (≥3).

• Number of established cooperations with the technology sector (≥6).

• Increased patient and medical staff satisfaction (≥70% positive ratings).

6.1.2. Activity 2 Raising the awareness and knowledge of medical stuff and students in the area of innovative medical solutions, including telemedicine

The aim of the activity is to raise the awareness and knowledge of medical workers and students in the field of innovative medical solutions, including telemedicine. The activity will cover 100 medical workers and 300 students over 2 years through training, workshops, conferences and practical classes using new medical technologies.

Timeline and milestones

Year 1: Preparation and first phase of training

• M1: (Month 1-3) Development of a training program, recruitment of experts and trainers.

• M2: (Month 4-6) Development of e-learning training materials, recruitment of participants.

• M3: (Month 7-12) Start of training: workshops for medical staff, classes for students, first conference on telemedicine.

Year 2: Expanding and consolidating knowledge

• M4: (Month 13-18) Implementation of interactive simulations and practical case studies using telemedicine kiosks

• M5: (Month 19-21) Evaluation of program effectiveness, adjustment of training content.

• M6: (Month 22-24) Summary conference, certification of participants, publication of a report with the effects of the activity.

Staff required

• Telemedicine and innovation experts: doctors, biomedical engineers, IT specialists.

• Trainers and lecturers: experienced practitioners and scientists in the field of e-health and new technologies.

• IT team: e-learning platform administrators, digital education specialists.

• Project coordinator: person managing the schedule and cooperation with participants.

Hardware and financial resources

• E-learning platform with access to interactive courses and materials.

• Medical simulators and telemedicine equipment for practical workshops.

• Budget for organizing conferences, workshops and fees for experts.

Assumed results and impact

• Results:

o Training of 100 medical workers and 300 students.

o Organization of at least 2 conferences and 10 practical workshops.

o Creating an accessible e-learning platform for participants.

• Impact:

o Increased awareness and competence in the field of innovative medical technologies.

o Preparing staff for the effective use of telemedicine in clinical practice.

o Increased interest of students in modern methods of diagnosis and treatment.

Key Success Indicators (KPIs)

• Number of participants trained (≥400).

• Number of training and workshops conducted (≥10).

• Number of conference participants (≥200).

• Degree of satisfaction of participants (≥85% positive ratings).

• Number of students and employees using telemedicine in practice (≥40%).

6.2. Activities to support the implementation of Priority 2

6.2.1. Activity 1 Scaling the introduced solution to other clinics and teaching hospitals

After successfully testing the digital signature in one of the hospital clinics, we plan to expand the implementation to 30 clinics in the same hospital and in two other clinical hospitals. The goal is to improve the efficiency of medical documentation management, eliminate paper documents and increase the convenience of patients and staff.

Timeline and milestones

Year 1: Preparation for implementation and first tests

• M1: (Month 1-3) Development of a detailed implementation plan, analysis of IT infrastructure in hospitals.

• M2: (Month 4-6) Purchase and configuration of equipment for the first clinics.

• M3: (Month 7-12) Implementation in the first 5 clinics, staff training, system performance tests.

Year 2: Scaling the implementation

• M4: (Month 13-18) Extension of the system to another 10 clinics in the first hospital.

• M5: (Month 19-24) Implementation in the first clinics in the second and third hospitals (10 new implementations in total).

Year 3: Finalization and optimization

• M6: (Month 25-30) Implementation in the last 5 clinics, adapting the system to the specific needs of various units.

• M7: (Month 31-36) Project summary, analysis of results, publication of report and recommendations.

Staff required

• IT team: system administrators, programmers integrating digital signature with the hospital system.

• Implementation coordinator: overseeing the schedule and cooperation between hospitals.

• Medical staff: doctors and nurses using the system, trained in the new solution.

• Data security specialists: ensuring system compliance with legal regulations.

Hardware and financial resources

• Tablets and digital pens for each clinic (30 sets).

• Integration with hospital systems (e.g. Electronic Medical Records - EDM).

• Staff training and technical support.

• Budget for IT infrastructure, software licenses and system maintenance.

Assumed results and impact

• Results:

o Implementation of the solution in 30 clinics.

o Elimination of paper signatures in medical documentation in clinics covered by the project.

o Training of medical and administrative staff in the use of the system.

• Impact:

o Reducing patient service time thanks to documentation automation.

o Reduction of costs related to printing and archiving documents.

o Greater security of patient data through digital authorization and encryption.

o Possibility of further expansion of the system to other medical units.

Key Success Indicators (KPIs)

• Number of clinics covered by the implementation (≥30).

• Percentage of documents signed digitally (≥90% in covered clinics).

• Number of trained employees (≥60).

• Reduction of patient administrative service time (≥30%).

• Reduction in costs related to paper documentation (≥50%).

6.2.2. Activity 2 Raising patients' awareness and knowledge about biometric signatures

The aim of the activity is to raise patients' awareness and knowledge about the biometric signature, its security, legal compliance and the benefits it brings to them and the health care system. Within 1 year, 100 patients will be involved in educational activities and will take part in workshops, information campaigns and demonstration sessions in hospital clinics.

Timeline and milestones

First half of the year: Preparation and commencement of activities

• M1: (Month 1-2) Development of educational materials (leaflets, posters, instructional videos, website).

• M2: (Month 3-4) Recruitment of the first patients for the information program, start of the information campaign in clinics.

• M3: (Month 5-6) Organization of the first workshops and demonstration of biometric signature for patients.

Second half of the year: Intensification of activities and evaluation of effects

• M4: (Month 7-8) Expanding the campaign to other units, monitoring patient opinions, updating educational materials.

• M5: (Month 9-10) Organizing the second series of workshops and demo sessions.

• M6: (Month 11-12) Project summary, patient awareness level survey, final report with recommendations for the future.

Required personnel

• E-signature and medical law experts – specialists explaining legal and technological aspects to patients.

• Educational team – people conducting workshops and creating information materials.

• Medical staff – doctors and nurses supporting patients in signing documents digitally.

• IT team – responsible for preparing demonstrations and providing technological support.

Equipment and financial resources

• Educational materials – leaflets, posters, information animations, a dedicated section on the hospital's website.

• Biometric tablets and pens for demonstrations in counseling centers.

• Budget for the organization of workshops, production of educational materials and summary survey.

Expected results and impact

•Results:

o About 100 patients trained in biometric signatures.

o Organization of at least 2 series of workshops and demonstration sessions.

o Preparation and distribution of educational materials in hospitals.

• Impact:

o Greater acceptance of biometric signatures among patients.

o Reduction of administrative service time in clinics thanks to a smoother process of signing documents.

o Increasing the level of safety and comfort of patients by eliminating paper forms.

Key Success Indicators (KPIs)

• Number of patients covered by the program (≥100).

• Number of workshops and demonstrations organized (≥2 series).

• The degree of acceptance of the biometric signature by patients (≥80% of positive opinions).

• Number of clinics equipped with educational materials (≥10).

• Number of views of online materials (≥500).

6.3. Activities to support the implementation of Priority 3

6.3.1. Activity 1 Establishment of a Think Tank operating in the area of the Healthcare System

The aim of the activity is to create a Think Tank that will create and promote changes and new systemic solutions in the area of health. Think Tank will bring together experts from various fields, conducting analyses, developing recommendations and publications, as well as participating in key conferences. Over the course of 2 years, 5 publications will be created, and Think Tank members will take part in 5 industry events, promoting innovative solutions and initiating debate on reforms in healthcare.

Timeline and milestones

Year 1: Creating a structure and first analyses

• M1: (Month 1-3) Recruiting experts, establishing a team, defining research areas.

• M2: (Month 4-6) Developing the first report and publication (topics related to key challenges of the healthcare system).

• M3: (Month 7-12) Organizing the first industry event, participating in a conference, starting further research.

Year 2: Intensification of activities and promotion of results

• M4: (Month 13-18) Two more publications, consultations with decision-makers.

• M5: (Month 19-21) Participation in further conferences, launch of a campaign promoting research results.

• M6: (Month 22-24) Preparation of a final report summarizing Think Tank's activities over the two years, organization of a summary event.

Required staff

• Experts in public health and innovation - scientists, physicians, health policy analysts.

• Specialists in health law and economics - experts analyzing legislative and financial aspects of new solutions.

• Communication and promotion team - responsible for publications, event organization and cooperation with the media.

• Project coordinator - managing the Think Tank's schedule and activities.

Equipment and financial resources

• Budget for research and analysis in the field of the healthcare system.

• Financing of publications and reports, their distribution and promotion in the media.

• Funds for experts to participate in conferences, organize their own events and discussion panels.

Expected results and impact

• Results:

o Development of 5 publications analyzing key areas of the healthcare system.

o Participation in 5 events in the healthcare area, presentation of analysis results.

o Initiation of a debate on healthcare reforms.

•Impact:

o Raising awareness and knowledge of decision-makers and public opinion on systemic changes.

o Influence on shaping health policy through recommendations for institutions and ministries.

o Increasing interest in innovative solutions among medical experts and practitioners.

Key success indicators (KPIs)

• Number of published reports and analyses (≥5).

• Number of conferences and events attended by Think Tank experts (≥5).

• Number of report recipients (≥1000 downloads/receipts of publications).

• Number of institutions and decision-makers who used Think Tank recommendations (≥5).

• Degree of media interest in publications (≥30 mentions in media).

6.3.2. Activity 2 Dedicated website

The aim of the activity is to create a database on new organizational and process solutions in the healthcare system. The database will take the form of a dedicated website and will be linked to Think Tank's activities, constituting a knowledge and innovation center. It will contain the effects of Think Tank's work, as well as solutions developed by other entities and partners, which will allow for a broad exchange of knowledge and good practices.

Timeline and milestones

Year 1: Development of the concept and launch of the website

• M1: (Month 1-3) Development of the scope and functionality of the database, analysis of existing solutions, consultations with experts and partners.

• M2: (Month 4-6) Design and creation of the website, development of the user interface.

• M3: (Month 7-12) Pilot implementation of the website, publication of the first Think Tank content, user tests.

Year 2: Content expansion and promotion

• M4: (Month 13-18) Expand the database with materials from partners, add interactive features (search engine, thematic filters).

• M5: (Month 19-21) Promotional campaign, presentation of the database at conferences and in industry media.

• M6: (Month 22-24) Project summary, effectiveness assessment.

Required Personnel

• IT team and UX/UI designers – responsible for website development and usability.

• Healthcare experts – responsible for content selection and development.

• Partnership coordinator – engaging external institutions and organizations to contribute solutions.

• Communication and marketing team – ensuring the database is widely recognized in the medical and scientific communities.

Technical and Financial Resources

• Server and IT infrastructure for website functionality.

• Budget for website development and maintenance.

• Funding for promotion and integration with conferences and industry media.

• Costs for content moderation and regular updates.

Expected Results and Impact

• Results:

o Creation of a database in the form of a website, accessible to experts, healthcare managers, and public institutions.

o Publication of Think Tank reports and innovative solutions from other entities.

o Implementation of a thematic search engine and filtering tools.

o Promotional campaign targeting the medical and academic community.

Impact:

o Improved access to knowledge on healthcare innovations.

o Support for decision-makers and healthcare managers in implementing organizational and process improvements.

o Building a network of experts around the platform, fostering knowledge exchange and new initiatives.

Key Performance Indicators (KPIs)

• Launch of the website and database (1 fully functioning platform).

• Number of published materials (≥50 articles, analyses, reports ect.).

• Number of contributing entities and partners (≥7).

• Number of database users (≥1,000 in the first year).

• Number of conferences and events where the database is promoted (≥2).

6.4. Activities to support the implementation of Priority 4

6.4.1. Activity 1 Central European database of good practices and innovative solutions

The aim of the activity is to create a common, partner/European database of good practices and solutions in healthcare and to mutually test innovations in Living Labs in different regional conditions. Initially, the database will be supplied with solutions from HL4V project partners, who will simultaneously test each other's solutions. At a later stage, the database will be joined by solutions from third parties, who will also be able to share their innovations for testing in the Living Lab network.

Timeline and milestones

Year 1: Creation of the database and first tests

• M1: (Month 1-3) Defining the scope and structure of the database, obtaining the first solutions from HL4V partners.

• M2: (Month 4-6) Building and launching the digital platform, developing rules for testing solutions in Living Labs.

• M3: (Month 7-12) Starting mutual tests of HL4V partners, first evaluation of effects.

Year 2: Expanding cooperation and integrating new entities

• M4: (Month 13-18) Making the database available to third parties, implementing new solutions for testing in Living Labs.

• M5: (Month 19-24) Organizing workshops and meetings for new partners, expanding the functionality of the database, developing standards for knowledge exchange and best practices.

Year 3: Scaling and long-term development strategy

• M6: (Month 25-30) Expand testing to new regions, increase the number of partners and solutions involved.

• M7: (Month 31-33) Develop a strategy for long-term maintenance and development of the database, initiate activities aimed at integrating the database with other European health initiatives.

• M8: (Month 34-36) Summary of activities, publication of the final report, presentation of project results at international conferences.

Required staff

• IT team and UX/UI designers – creating and managing the digital platform.

• Medical innovation experts – verification and evaluation of solutions before publication in the database.

• International cooperation coordinator – managing cooperation with HL4V partners and third parties.

• Living Labs organization team – organizing and coordinating tests in different regions.

• Promotion and communication team – informing about the database and engaging new entities.

Hardware and financial resources

• IT infrastructure – servers and database management system.

• Budget for platform development and maintenance, including technical support and updates.

• Funds for organizing Living Lab tests – financing necessary equipment and evaluation studies.

• Promotional and networking costs – conferences, webinars, publications.

Expected results and impact

• Results:

o Creation of a European database of good practices and innovative solutions.

o Testing of the first solutions of HL4V partners in different regional conditions.

o Making the database available to third parties and starting to test their solutions in Living Labs.

o Integration of different ecosystems of health innovations at the European level.

o Creation of a strategy for the long-term development of the database and its linkage with other European initiatives.

• Impact:

o Better transfer of knowledge and experience between regions and countries.

o Facilitating the implementation of innovations in different healthcare systems.

o Creation of a European cooperation network for innovators, start-ups and medical institutions.

o Increasing the efficiency of healthcare systems thanks to the availability of proven and tested solutions.

Key success indicators (KPIs)

•Number of solutions in the database (≥40 after 3 years).

•Number of tested innovations in Living Labs (≥20).

•Number of partners using the database (≥15).

•Number of workshops and networking meetings organised (≥5).

•Number of countries involved in the project (≥6).

•Number of conferences and events where the database was promoted (≥5).

6.4.2. Activity 2 Conferences and workshops

The aim of the activity is to organize international conferences and workshops, which will be a platform for the exchange of knowledge and experience in the field of innovation in healthcare. The events will be attended by all partners of the Health Labs4Value (HL4V) project as well as additional experts and stakeholders. The initiative will organize at least two joint conferences and four other events, e.g. workshops, seminars or discussion panels.

Timeline and milestones

Year 1: Planning and first events

• M1: (Month 1-3) Development of the schedule of events, identification of key topics and speakers.

• M2: (Month 4-6) Organization of the first internal workshops for HL4V partners.

• M3: (Month 7-12) Preparation and implementation of the first international conference, where innovative HL4V solutions will be presented.

Year 2: Expanding cooperation and international expansion

• M4: (Month 13-18) Organization of two more workshops, broadening the topics to include new areas of innovation in healthcare.

• M5: (Month 19-24) Preparation and implementation of the second international conference, with the participation of new partners from outside HL4V.

Year 3: Scale and Sustain the Initiative

• M6: (Month 25-30) Organize the last two events (workshops, panel discussions, networking meetings).

• M7: (Month 31-33) Summarize events to date, develop a strategy for continuing activities.

• M8: (Month 34-36) Implement conclusions for further HL4V initiatives.

Required staff

• Conference organization team – coordination of events and ensuring efficient logistics.

• Innovation and medicine experts – preparation of substantive presentations and discussion panels.

• Communication and promotion specialists – promotion of events in the media and scientific communities.

• Moderators and trainers – conducting workshops and interactive sessions.

Equipment and financial resources

• Budget for organizing conferences and workshops, including renting rooms, inviting speakers and promotional materials.

• IT infrastructure – tools for organizing online events and live broadcasts.

• Networking funds – building lasting relationships between HL4V project partners and new stakeholders.

• Travel and accommodation costs for participants and speakers.

Expected results and impact

<u>•Results:</u>

o Organization of at least 2 international conferences and 4 workshops/seminars.

o Expanding the topics to include new areas of medical and organizational innovation.

o Increased cooperation between HL4V partners and new stakeholders.

o Making conference and workshop materials available in publications and recordings.

<u>• Impact:</u>

o Strengthening international cooperation in healthcare innovation.

o Dissemination of best practices and modern solutions through a wide network of recipients.

o Increasing awareness of tested and implemented innovations among decision-makers and the medical community.

o Creating new initiatives and projects resulting from networking during events.

Key Success Indicators (KPIs)

- Number of events organized (≥6).
- Number of conference and workshop participants (≥300 in total).
- Number of countries represented at events (≥7).
- Number of speakers and experts involved in events (≥30).
- Number of materials published after conferences (≥6 reports, articles or recordings).

7. Collaboration and partnerships

7.1. Identification of key stakeholders

1. Medical Universities and Research Institutes. Institutions conducting research on medical innovations and providing organizational support for scientific projects.
2. Clinical Hospitals and Medical Facilities. Places for testing and implementing innovative technological and organizational solutions.
3. Government Organizations and Regulatory Institutions (e.g., Ministry of Health, National Health Fund, EMA, WHO). Entities responsible for developing regulations, financing the healthcare system, and overseeing the implementation of new solutions.
4. Technology Companies and Medical Startups. Entities providing innovative IT and hardware solutions in the health
5. Patient Organizations and NGOs. Entities representing patient interests and conducting educational campaigns on new medical technologies.
6. Medical Personnel (Doctors, Nurses, Medical Technicians, Hospital Administrators) Individuals directly using innovations and implementing them in daily clinical practice.
7. Decision-Makers and Politicians (MEPs, MPs, Local Government Representatives). Individuals shaping healthcare policies at the national and international levels.
8. International Organizations and European Partners (e.g., HL4V partners, EIT Health, OECD). Entities operating at the international level, supporting the development of innovations in healthcare systems.

7.2. Roles and responsibilities

1. Medical Universities and Research Institutes

- Providing scientific and expert knowledge.
- Testing innovative solutions within Living Labs.
- Organizing conferences and workshops and publishing research results.
- Collaborating in the development of the database of best practices and the Think Tank.

2. Clinical Hospitals and Medical Facilities

- Implementing and testing new technologies (e.g., digital signatures, telemedicine).
- Engaging medical staff in training and workshops.
- Collaborating on the development and implementation of systemic organizational innovations.
- Organizing educational meetings and events for patients.

3. Government Organizations and Regulatory Institutions (e.g., Ministry of Health, National Health Fund, EMA, WHO)

- Establishing legal frameworks for implemented solutions.

- Financially supporting innovative projects.
- Incorporating Think Tank recommendations into national and European strategies.
- Providing patronage for conferences and workshops.

4. Technology Companies and Medical Startups

- Developing and supplying innovative technologies (e.g., biometric signatures, telemedicine tools).
- Participating in testing and evaluation of implemented solutions.
- Collaborating in the development of the database of best practices and Living Labs platform.
- Sponsoring events and showcasing new technologies at conferences.

5. Patient Organizations and NGOs

- Educating patients about the benefits of new technologies (e.g., biometric signatures).
- Co-organizing educational events and awareness campaigns.
- Testing solutions from the end-user perspective.
- Collaborating in the development of implementation strategies.

6. Medical Personnel (Doctors, Nurses, Medical Technicians, Hospital Administrators)

- Participating in training on new technologies and processes.
- Testing and providing feedback on the functionality of systems.
- Engaging in the creation of best practices and recommendations for the database.
- Attending conferences and workshops.

7. Decision-Makers and Politicians (MEPs, MPs, Local Government Representatives)

- Providing legislative support for the implementation of innovations.
- Participating in conferences and debates on the future of the healthcare system.
- Supporting Think Tank initiatives and the database of best practices.
- Promoting implemented solutions at national and European levels.

8. International Organizations and European Partners (e.g., HL4V partners, EIT Health, OECD)

- Collaborating in organizing international conferences and events.
- Jointly testing solutions in different regional conditions.
- Providing data and reports for the database of best practices.
- Developing implementation strategies at the European level.

7.3. Mechanisms for collaboration

The Medical University of Lodz will be the leader and coordinator of the cooperation. The cooperation will be based on voluntary participation. Individual activities requiring financial involvement and sharing resources will be regulated by separate agreements. Teams involving representatives of the parties involved will be appointed for individual projects. Roles and responsibilities will be assigned in accordance with the PRINCE 2 methodology used by the Medical University of Lodz.

8. Risk assessment and mitigation strategies

Risk	Probability of occurrence	Mitigation strategy
Delays or obstacles due to legal and regulatory constraints (e.g., data protection, medical certification)	Medium	Engage legal experts early in the projects. Cooperate with regulatory bodies (e.g., Ministry of Health). Align new solutions with existing legal frameworks and standards.
Lack of acceptance from healthcare professionals due to workload increase, lack of trust, or lack of knowledge.	Medium	Provide continuous training and awareness programs. Demonstrate practical benefits through pilot projects and testimonials. Offer incentives for early adopters (e.g., certification, professional development).
Patients may be hesitant to adopt new solutions like digital signatures or telemedicine due to data security concern	Medium	Conduct educational campaigns to explain benefits and security measures. Ensure transparency in data usage and obtain patient feedback. Engage patient organizations to build trust and credibility.
Lack of financial resources to fully implement and sustain the initiatives	Medium to High	Secure multiple funding sources (EU grants, private partnerships, public funds). Prioritize cost-effective solutions and optimize resources. Monitor budget allocation closely to avoid overruns.
Cultural, administrative, and logistical challenges in coordinating multi-country initiatives	Low	Establish clear governance structures and roles. Use standardized project management methodologies. Promote regular communication through digital collaboration tools.

9. Monitoring and evaluation framework

9.1. KPI tracking methodology

To effectively measure the success of the proposed initiatives, the following methodology will be applied:

Defining KPI Categories

The KPIs will be grouped into the following categories:

- **Implementation KPIs** – measuring the progress of actions.
- **Engagement KPIs** – tracking stakeholder participation.
- **Impact KPIs** – assessing the effects on the healthcare system.
- **Sustainability KPIs** – evaluating long-term viability.

KPI Measurement Methods

A. Implementation KPIs (Tracking project execution)

KPI	Measurement Method	Frequency	Tools
Number of solutions tested in Living Labs	Project reports, tracking tools	Quarterly	Project management software
Number of hospitals and clinics implementing solutions	Implementation reports	Semi-annual	Surveys, direct monitoring
Number of publications and policy recommendations	Document review	Annual	Research and documentation tools

B. Engagement KPIs (Participation levels of key stakeholders)

KPI	Measurement Method	Frequency	Tools
Number of trained medical professionals and students	Attendance records	Quarterly	LMS (Learning Management System), sign-in sheets

Number of patient participants in awareness programs	Event participation logs	Semi-annual	Event registration platforms
Number of conferences and workshops organized	Event reports	Annual	Event management software

C. Impact KPIs (Effectiveness of interventions)

KPI	Measurement Method	Frequency	Tools
Adoption rate of digital signature solutions	System usage analytics	Monthly	IT system logs
Reduction in paper-based documentation	Hospital reports	Annual	Data comparison (pre/post implementation)
Number of organizations using the database of best practices	Platform analytics	Quarterly	Web analytics tools

D. Sustainability KPIs (Long-term impact and growth)

KPI	Measurement Method	Frequency	Tools
External funding secured for continuation	Financial reports	Annual	Budget tracking tools
Expansion of partnerships in the EU	Partnership agreements	Annual	Stakeholder engagement reports
Increase in policy adoptions based on	Policy adoption tracking	Annual	Legislative reports

Think Tank recommendations			

9.2. Reporting mechanisms

To ensure transparency, accountability, and continuous improvement, a structured reporting mechanism will be implemented. The mechanism will include different types of reports, clear responsibilities, and digital tools to streamline the process.

Report Type	**Purpose**	**Frequency**	**Audience**	**Content**
Monthly Progress Report	Tracks ongoing activities and milestones	Monthly	Project Team, Steering Committee	KPIs status, challenges, upcoming tasks
Quarterly Performance Report	Provides an in-depth assessment of progress and engagement	Quarterly	Project Stakeholders, Funders, Regulators	KPI trends, budget utilization, stakeholder feedback
Annual Impact Report	Evaluates long-term effects and sustainability	Annually	Government, EU Partners, Policy Makers	Achievements, challenges, policy impact, financial summary
Ad-hoc Reports	Addresses specific	As needed	Decision-makers,	Risk assessments, change

	challenges, risks, or opportunities		Regulatory Bodies	recommendations, incident reports