

ProVaHealth

PRODUCT VALIDATION IN HEALTH

— Evaluating transnational testing
in Baltic Sea Region Living Labs

 **Interreg**
Baltic Sea Region



EUROPEAN
REGIONAL
DEVELOPMENT
FUND



HEALTH INNOVATION CENTRE
OF SOUTHERN DENMARK



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EXECUTIVE SUMMARY



The purpose of this report is to evaluate the 14 cross-border pilot collaborations executed within the ProVaHealth project activity 4.2. The project was funded under the EU Interreg Baltic program and focuses on **strengthening collaboration** between *Health Living Labs in the Baltic Sea Region*.

The report draws on 14 collaboration pairs between one small and medium-sized enterprise (hereafter SME) and one Living Lab from different countries in the Baltic Sea Region. In an effort to evaluate how transnational Living Lab services could be conducted, and how services could scale from one country to another, these partnerships were each funded with 5000 EUR. In terms of categorising the products and services for test, as well as the services rendered, the 14 tests represent a very broad spectrum of health, as presented in the appendix. The tests were evaluated under the headlines of *Matching & contracting*, *Evaluation of work carried out*, and *Future perspectives*.

Regarding Matching and contracting, there was a very high degree of satisfaction with the process across SMEs and Living Labs. This is echoed throughout the findings of the report, as there is a high degree of satisfaction with the work done concerning quality found and in the future perspectives in terms of possible future collaborations.

Living Labs view the Matching and contracting phase as somewhat too cumbersome, but this is not mirrored by the SMEs who find it adequate or even too short. This finding is especially interesting in the context of this project, where the tests have been paid, and extensive communication efforts have been performed. This and other indications entails that Living Labs may have to rethink their business models, which in many circumstances build on paid services from companies, and likewise have to rethink how they attract and collaborate with SMEs. In this regard, initiatives such as defining a clear value proposition and working with an external network or as testing partner in an existing network or organisational structure may be beneficial to Living Labs. Living Labs therefore may have to reconsider the position of viewing a long contracting period as negative, and see it as part of the value for the SME. In that sense it is of course relevant to adjust processes to either generate value on a shorter time, or support a longer matching and contracting phase with a lower time consumption.

Despite of this, both the SMEs and Living Labs were very satisfied with the quality of the work done. While there were some differences in the level of expectations to the collaboration, the general level of satisfaction with the outcomes was very high.

While some Living Labs found difficulties in recruiting external test persons for their tests, this did not influence the SMEs satisfaction greatly. As co-creation and real life evaluation with real users is a central core of most Living Lab services, securing a local, stable, and accessible panel of users could be a prudent solution to this issue. This however requires a large reach or database of potential candidates for testing.

The high level of satisfaction found in previous sections was mirrored concerning Future Perspectives. Specifically, SMEs often wanted to repeat the process and collaborate either with the same or with some other Living Lab in the future. Across the questions of repetition, future collaboration and concrete plans, the responses was generally significantly positive and provide cause for optimism with regards to the services provided to the SMEs, and the organisation of the work done.

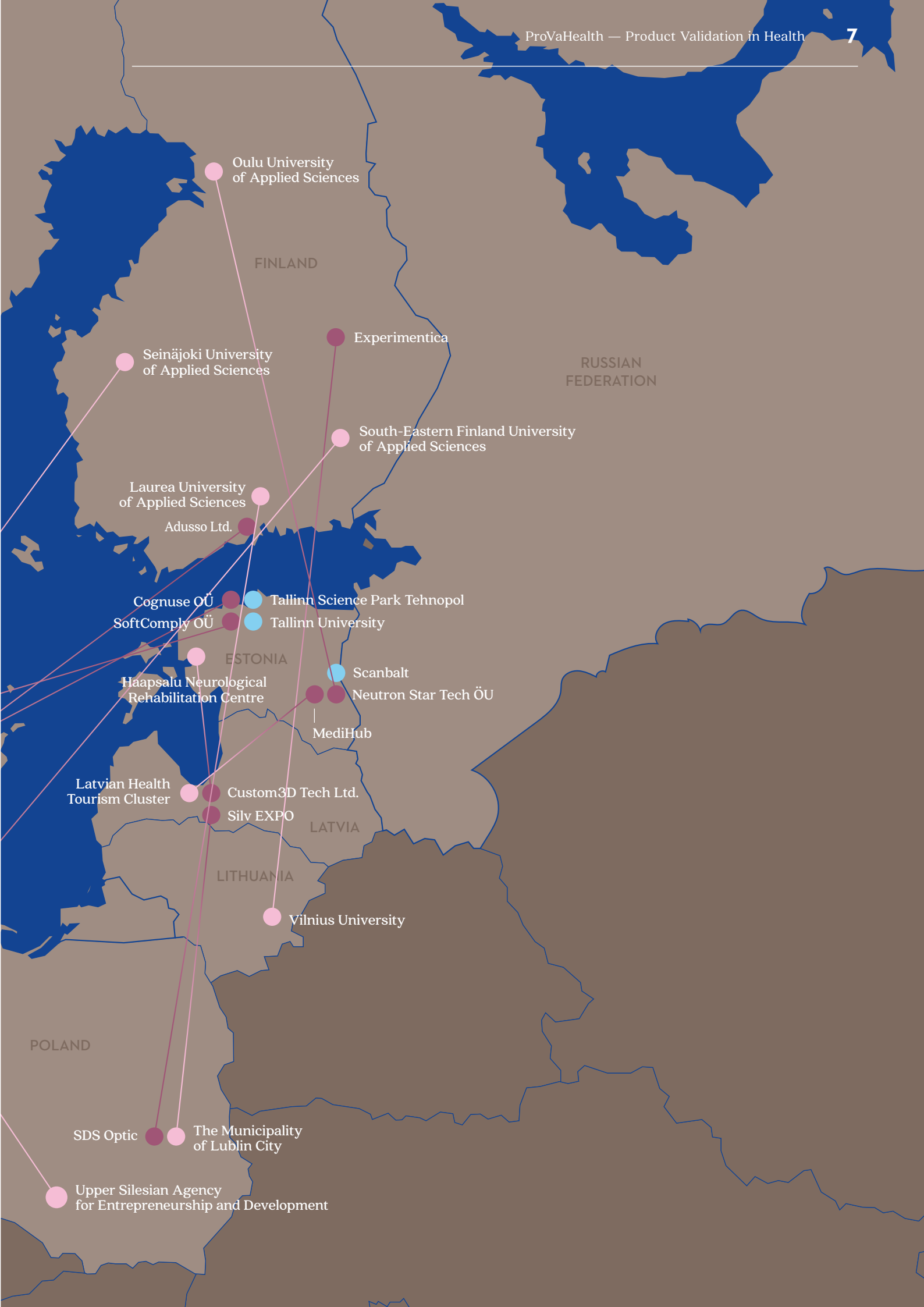


*Presentation on the main findings
found in this report
by Jens Strandbech, co-author
of this report*

ProVaHealth

- Living Lab and project partner
- Small and medium-sized enterprise (SME)
- Project partner





CHAPTER 1

INTRODUCTION

In 2017, the European Union Regional Development Fund co-financed the project ProVaHealth with almost 2.3 million EUR under the Baltic Sea Region program. ProVaHealth is a **collaboration across eight different Baltic Sea countries**, and consists of 17 primary partners whereof 14 represent a Living Lab.

ProVaHealth project aim

The main aims of the project are outlined in the strategy of the project application, which is included in a slightly edited form below.

Living Labs are user-centred, open-innovation ecosystems integrating concurrent research and innovation processes within a public-private-people partnership, collaborating for creation, prototyping, validating, and testing of new technologies, services, products, and systems in real-life contexts. Living labs help and support companies rapidly commercialize and scale up their innovations and products to global markets.

Living Labs are user-driven innovation environments where users and producers co-create innovation in a trusted, open ecosystem that enables business and societal innovation, which focus on value creation and solving problems. The involvement of SMEs in close relation with user communities, public organizations, and research institutions in a Living Lab setting helps to address different economic, legal, and ethical matters, and maximizes the benefits of innovation in a particular territory. In this way, a Living Lab may bring new perspectives on technological and social innovation.

Currently, innovative SMEs are unevenly distributed and are especially lacking in the Baltic countries and Poland, due to the shortage of risk willing financing, while the large industries, like pharmaceutical companies, are mostly located in the Nordic countries and North Germany. In the medium and long term, the Baltic Sea Region is among the most dynamic healthcare markets in Europe. Healthcare spending in Poland and the Baltic States is growing at a disproportionately high rate and is approaching the average for Europe.

A weak transnational and trans-sectoral coordination of the innovation chain in Baltic Sea Region is slowing down transfer of innovative products and services. In order to further exploit the potential of the market and meet the societal challenges a process has been initiated by ScanBalt aiming for the — Baltic Sea Region as one test site for development of health care products and services. ProVaHealth would become one important tool for this process with the aim of overcoming several challenges.

There exists a lack of coordination and cooperation both within a country and transnationally. Further, one cannot rule out possible competition between Living Labs within a given country and between countries owing to the objective to make the individual Living Labs financially viable. This calls for better cooperation and may lead to an increase in the volume of Living Lab activities overall which will support both development of innova-

tive solutions, commercialisation of these and better financial viability of the Living Labs themselves.

Within the context as described above three challenges are encountered which ProVaHealth will try to tackle: 1) Living Lab are insufficiently utilised and lack sustainable business models 2) the Living Lab infrastructure serves only locally or regionally and 3) slow market uptake.

- 1 Many Living Labs have been created and initially funded in the context of an EU or nationally funded program, and their business models are often not sustainable in the long term or need to be updated and improved to enable them to operate without public support. Underutilisation because of insufficient management structures and a lack of visibility among potential clients further threatens the economic sustainability of Living Labs.
- 2 Most Living Labs and testbeds in the Baltic Sea Region who focus on health and well-being work locally or regionally and not in cooperation with each other. They lack enough clients in their region for their specific niche, and incubators, accelerators, science parks or clusters, do not have enough capacity to develop top level Living Labs in all needed niches for their client SMEs. In addition, most Living Labs in the Baltic Sea Region lack close clinic-company collaboration. SMEs often miss access to existing clinical infrastructure in other countries to validate diagnostic tools and processes. There are significant cultural differences between the public and the private sectors, and public procurement procedures make it difficult to enter foreign markets for the companies and there is a lack of efficient support structures for health care innovation.
- 3 The gap between real needs of health innovation users and innovations developed by technology companies causes low market uptake of new products, low success rate of start-ups and health systems that responds too slow to real needs which influences the commercialization of Baltic Sea Region top level health science results and potentially causes a slow market uptake of new products.

Purpose of the report

The purpose of this report is to evaluate the 14 cross-border pilot collaborations executed within the project. The evaluation reports on the overall results across pilots and identifies important findings.

Readers guide

The first chapter holds an introduction to the report and provides an overview of the project and report aims, and elaborates on the process of identifying companies involved in the testing process.

The second chapter introduces the methodology of the report, as well as its limitations.

The third chapter provides an overview of the data collected at the conclusion of the 14 tests, and continues with three sections of key findings, elaborating on: Matching and contracting, Evaluation of work done, and Future Perspectives.

In the fourth chapter, the conclusions of the report are presented.

In addition to the four chapters, this report includes one appendix, which introduces all partners in the project and provides an overview of the pairs of Living Labs and SMEs involved in the test as well as a description of the collaboration which took place.

Project partners

The ProVaHealth project is led by Tallinn Science Park Tehnopol. The project includes one Living Lab from Estonia, one from Latvia, one from Lithuania, four from Finland, one from Sweden, three from Denmark, one from Germany and two from Poland.

The partners cover a large variety of health related fields such as active healthy aging, homecare, telemedicine, diagnostics, biomedicine, cardiology, oncology, acute care, health tourism, physical rehabilitation, neurorehabilitation, osteoarthritis, public diseases, and robotics.

For more information see the appendix which present an overview of the partners in the project as well as the involved SMEs. The project is supported by associated partners, find information on associated partners at www.projects.interreg-baltic.eu/projects/provahealth or contact the Health Innovation Centre of Southern Denmark.

Involving Small and Medium-sized Enterprises

The purpose of this section is to provide an overview regarding the process of including SMEs in the project.

Criteria for testing

As the ProVaHealth project focuses on SME framework conditions, all SMEs involved adhere to the EU Commission's definition of a SME¹. This definition states that the involved SMEs must have no more than 250 staff mem-

bers or a turnover of no more than 50 million euro. In addition, the project has a set of conditions demarcating the boundaries for the test. These were set to ensure a comparable foundation across the tests, and to ensure that collaborations were kept within any competition legislation.

- 1 The collaboration had to be across national borders, meaning that the respective SME and Living Lab could not be located in the same country, and both should be within the Baltic Sea Region.
- 2 The participating SMEs were given a voucher equivalent to maximum 5000 EUR declared as state aid under de minimis regulations.
- 3 The voucher could only be used to cover the Living Labs expenses in the test.
- 4 The SMEs needed to cover all other expenses regarding the test

Enrolment in the test phase

Work package 4.1 in ProVaHealth contained an analysis of needs and barriers for cross-border collaborations from a SME perspective. For this analysis, 82 SMEs were interviewed, distributed with approximately 10 interviews per participating country. The SMEs were recruited and interviewed by the respective project partners from the SMEs home country. The 82 SMEs constituted the foundation for finding relevant SMEs for the subsequent pilot testing, and were all invited to apply to be part of the pilot test process. In addition to this, project partners and associated organisations distributed an open call for applicants to the pilots across the EU.

Matching process

The matching process was planned as a stepwise process in which:

- 1 The interested SMEs applied for a test in a Living Lab by describing their company, product and need for testing in a healthcare oriented Living Lab.
- 2 This list of possible tests was compiled into a portfolio, which was distributed to all participating Living Labs.
- 3 Living Labs contacted the chosen SMEs for a detailed discussion of collaboration possibilities.
- 4 In cases where a collaboration could be formed, a draft contract for the actions and periods for the test was used.
- 5 If a draft contract was reached, the project team evaluated compliance with the criteria for testing before signing.

¹ https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

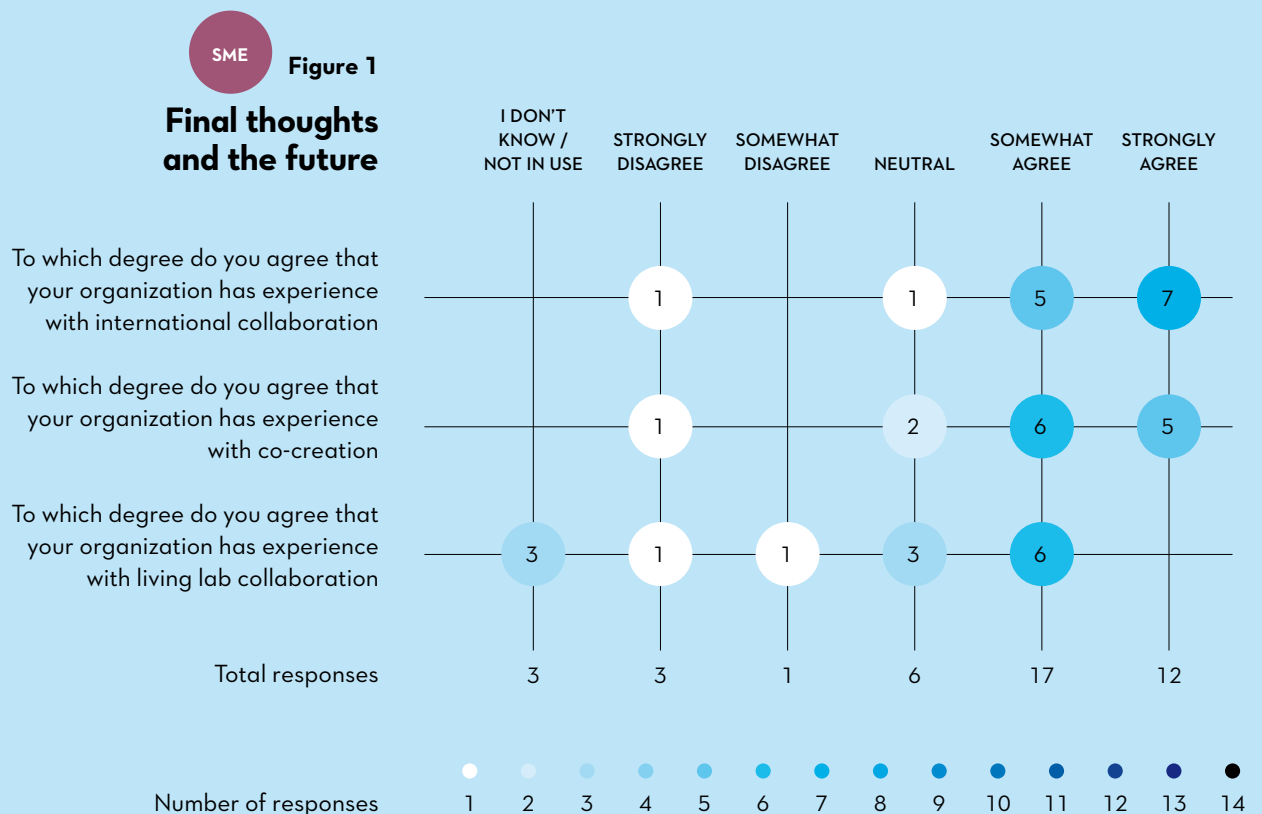
Not all Living Labs found a suitable SME to collaborate with as result of the above process, and some of the initiated collaborations ended before execution and conclusion. This meant that several other initiatives were taken to ensure all 14 tests could be executed within the project period. Amongst these initiatives was active assistance by associated partners and project partners, as well as an open for collaboration with the specific Living Labs missing a partner.

Overview of SME prerequisites for international Living Lab collaboration

The 14 involved SMEs were all collaborating across EU borders with Living Labs who often rely on user involvement and co-creation. Thus experience with Living Labs, Co-creation and international collaboration was evaluated. The involved SMEs were all asked regarding this as seen in the below heatmap. For a detailed readers guide to this heatmap, please see the section Illustrations, quotes and anonymity on page 16.

12 of the 14 SMEs participating in test activities were experienced in working internationally. This indicates that they have some experience from earlier collaborations, which they would be able to apply in the cross-border collaboration with the matched Living Lab. Concerning co-creation, 13 of the 14 either agreed or strongly agreed that they had experience with co-creation. Lastly, on the point of the SMEs experience with Living Lab collaboration, the data showed a more distributed result, as 6 of the 14 somewhat agreed that they had experience in that regard, and 2 disagreeing.

Overall, this provides some indication that the SMEs involved was prepared for the methods and processes most commonly applied in a Living Lab setting and was prepared to work internationally, but could necessarily draw on experiences with Living Labs.







CHAPTER 2

METHODOLOGY

The purpose of this chapter is to clarify the methodology used for analysing data in this report and elaborate on the limitations of the report overall.

Data analysis

The primary data source for this report was the evaluation questionnaire sent to all partners of the 14 pilots executed in the respective Living Labs within the project. The data from the questionnaire was primarily treated as quantitative data, and quantitative analysis methods were applied.

The questionnaire consisted of four types of input

- 1 Category based answers of nominal data such as type of organisation (e.g. Living Lab / SME).
- 2 Category based answers of ordinal data such as a five point scales representing level of agreement to a statement.
- 3 Comments elaborating the answers given for each question in the questionnaire. The comments were included in the report when relevant.

The questionnaire had several categorical responses of primarily ordinal data types. The possible responses in the questionnaire were often a 5-step Likert scale, used as frequently as possible in an effort to standardise the layout and facilitate comparison between questions.

In order to analyse the questionnaire the ordinal data answers were formatted into a numerical value in order to be able to make a correlation analysis of the data, and compare answers across different questions using visual illustrations. As an example of this, consider a question on agreement to a statement using a scale of — Strongly disagree, to — Strongly agree, with five options in total. The response of — strongly disagree will then yield a value of 1 and — strongly agree a value of 5. Responses such as — I don't know or — Phase not in use are given the value of 0.

The table below provides an overview of all possible answers and their numerical values when analysed quantitatively.

5	Very satisfied	Very much yes	We had very high expectations	We found a very high quality in the delivered results	Strongly agree	Output was much higher than expected
4	Somewhat satisfied	Somewhat yes	We had somewhat high expectations	We found a somewhat high quality in the delivered results	Somewhat agree	Output was somewhat higher than expected
3	Neutral	Neutral	We had average expectations	We found an average quality in the delivered results	Neutral	Output was as expected
2	Somewhat dissatisfied	Somewhat not	We had somewhat low expectations	We found a somewhat low quality in the delivered results	Somewhat disagree	Output was somewhat lower than expected
1	Very dissatisfied	Very much not	We had very low expectations	We found a very low quality in the delivered result	Strongly disagree	Output was much lower than expected
0	(Item irrelevant for me)	-	Phase not in use	Phase not in use	I don't know / Not in use	I don't know

Additionally, In order to investigate if a specific answer to one question was strongly related to a specific answer to another question, a correlation analysis was applied. This allows responses to be mapped out, and thereby investigated for potential relationship between responses, e.g. how much international collaboration a SME has, and how long time the tested product has before it is ready for market. While there exists some correlations in the dataset, these were never above what was expected and thus deemed unnecessary to report in the present report. Additionally, there were no correlations between answer across the three areas of matching and contracting, evaluation of work done and Future perspectives.

Illustrations, quotes and anonymity

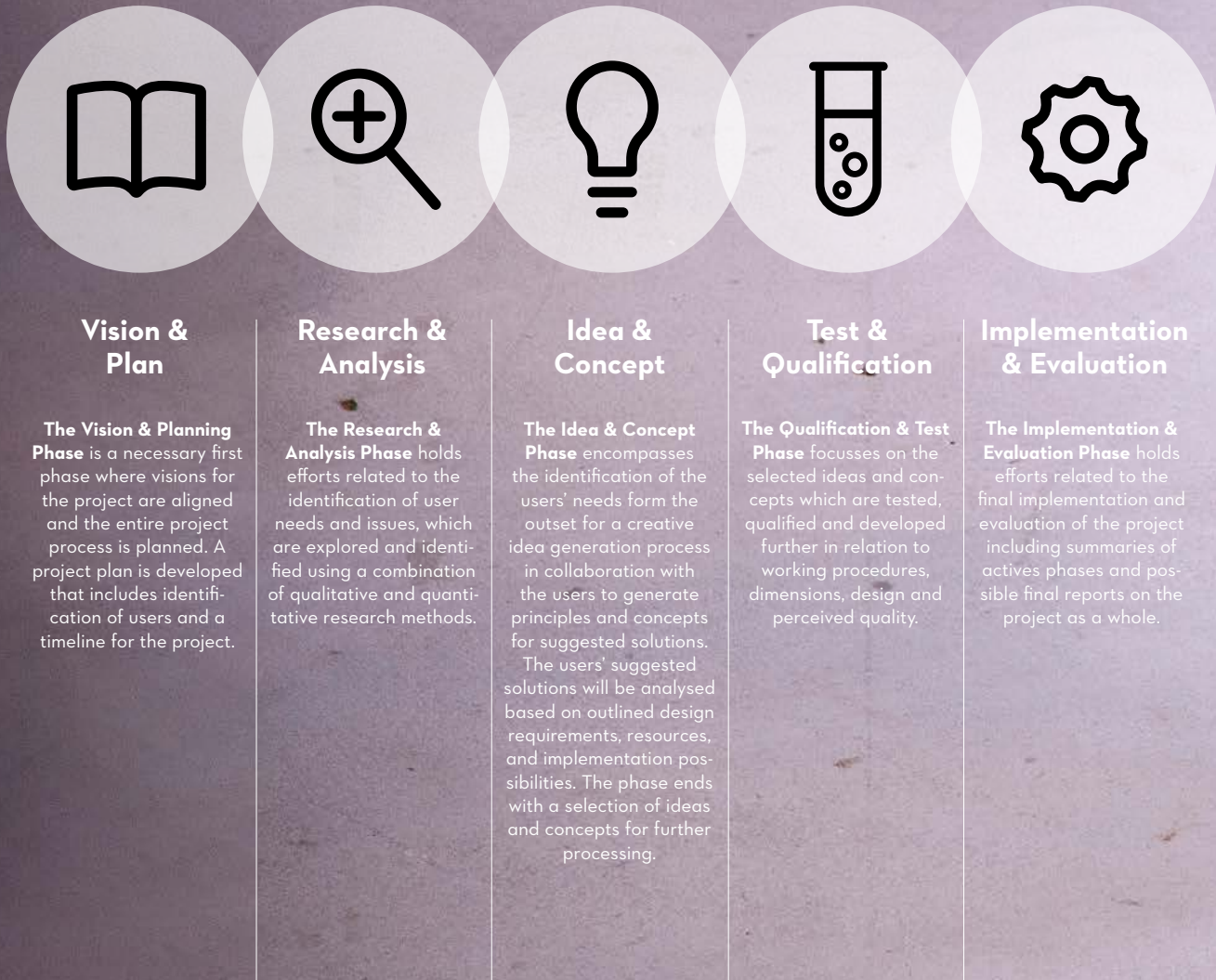
The illustration of results from the report is mostly done using Heatmaps as first seen on page 11. This type of diagram was chosen in order to give the reader a visual overview of answers given to a specific question or a set of questions. Vertically, different questions posed to the Living Labs and SME involved appear in short format. Along the bottom of the table, the different cate-

gories of answers are shown. At the bottom of each column, the summary for each category of answer is shown. This allows for a detailed view of both the distribution of answers

along e.g. a scale of satisfaction, but also an overview of the total satisfaction with a given range of questions. While all organisations are represented in the appendix, the actual author of quotes and data points has been removed. This is done on purpose since the goal of this report is to evaluate on Living Lab testing in general and not on case level. Quotes which appear in this report may have been edited for clarity.

The 5 phase model

Starting at the contracting all pilots were structured according to the below 5 phases. As is evident in the following sections, not all phase were in use in all tests, but required use of these phases allowed for a detailed discussion of input, timetables, and deliverables, which in turn enabled comparison between the 14 tests. The details of the five phase are not significant to this report, but are short overview is provided below





Limitations

The purpose of this section is to clarify the limitations of this report.

As mentioned previously, the purpose of this report is to evaluate upon the 14 cross-border pilot collaborations executed within the project. As the report draws on 14 pairs of SME and Living Lab collaboration, the results found here cannot be extrapolated outside the frame of the project with any degree of certainty. As such, the results found here should be viewed as reporting on the tests conducted and not as a guide or indication of what to expect when performing testing across borders.

In addition to the low number of respondents included in the data on which this report concludes, it should be noted that in order to be eligible to enter into the program, the SMEs were all to adhere to the limitations set in the above section Involving Small and Medium-sized Enterprises on page 10.

Furthermore, the data only draws on inputs from SMEs who are included in the project, and not from the SMEs with whom the Living Labs entered into the contracting phase with, but who ultimately were not chosen. This exact number is unknown, but is estimated between 20 and 40. Input from these SMEs could have provided valuable insight as to why collaborations were abandoned and have informed adjustments to the way the involved Living Labs conduct contracting.

Lastly, it should be noted that the questions which this evaluation draws on was designed and formatted at the start of the testing-period and did at that time not reflect the products or services which ultimately was included for testing in the project.

Accepting the above, the authors designed a secondary validation of the results by reaching out to non-project SMEs and experts asking for their views on the results presented here. Ultimately, this was abandoned due to a low number of responses despite significant promotional efforts.

CHAPTER 3

ANALYSIS OF DATA

The purpose of this chapter is to present the analysis of collected data. This chapter is divided into three sections, which focus on; **Matching and Contracting, Work carried out** and **Future perspectives.**

Matching & Contracting

Related to the phase of matching and contracting, both the SMEs and Living Labs were asked of their satisfaction regarding the initial matching process, the degree of transparency in the process, information on the process, information by the other party, their own commitment in time and/or resources, joint communication and overall satisfaction with the matching and contracting phase. In addition to these questions, the respondents were asked regarding their understanding of the process ahead.

With the SMEs showing 87 positive responses in total and the Living Labs showing 78 positive responses in total, both the Living Labs and SMEs are overall positive towards all aspects of the Matching and Contracting phase. This accounts for an 89% level of satisfaction in the SMEs and 80% with the Living Labs.

Only the question of time and resources spend in matching and contracting shows a significant degree of dissatisfaction. It should be noted that, when the Living Labs rate the overall process their perception may for some include several failed attempts at identifying partner SMEs and establishing a collaboration. This is found reflected in the responses to the question on the initial matching process, to which one SME is neutral and the rest is positive, but two Living Labs are respectively neutral and negative. In all four cases of negativity towards time and resources spend, the Living Lab sites either EU or national legal frameworks to be the biggest obstacles for the process to proceed smoothly.



From our point of view it took too much time but it was mainly due to 'third parties' such as national authorities (de minimis).

Living Lab

In addition to the explicit comments by the Living Labs on the subject of time spend in matching and contracting, the data suggests two other cause: Challenges in identifying a SME to collaborate with, and diverting understanding of test needs. The first and most widespread cause is challenges in finding and landing a SME partner.



It was hard to find a suitable SME match

Living Lab



It has taken much more time than expect to find partners interested in international testing

Living Lab



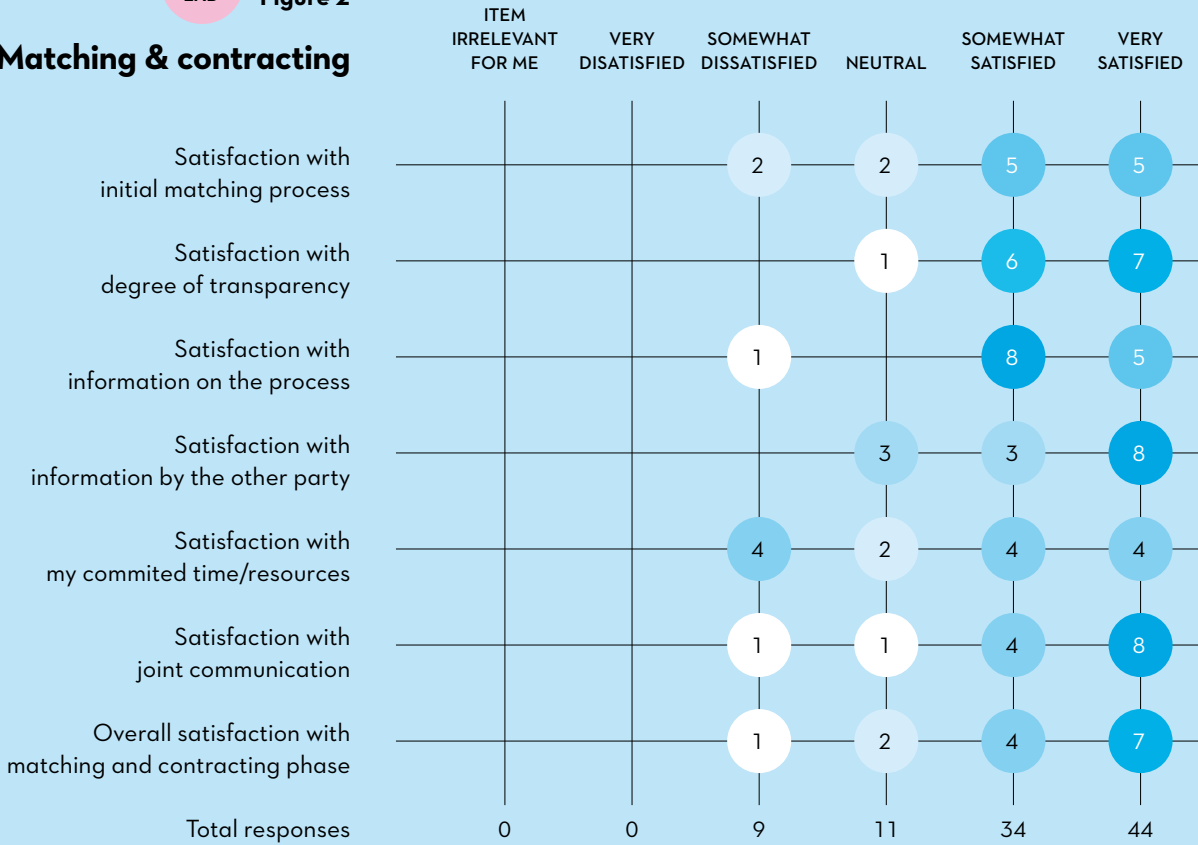
The process itself was professionally organized although we ended up finding — 'the other party' outside this official process using our own networks.

Living Lab

LIVING LAB

Figure 2

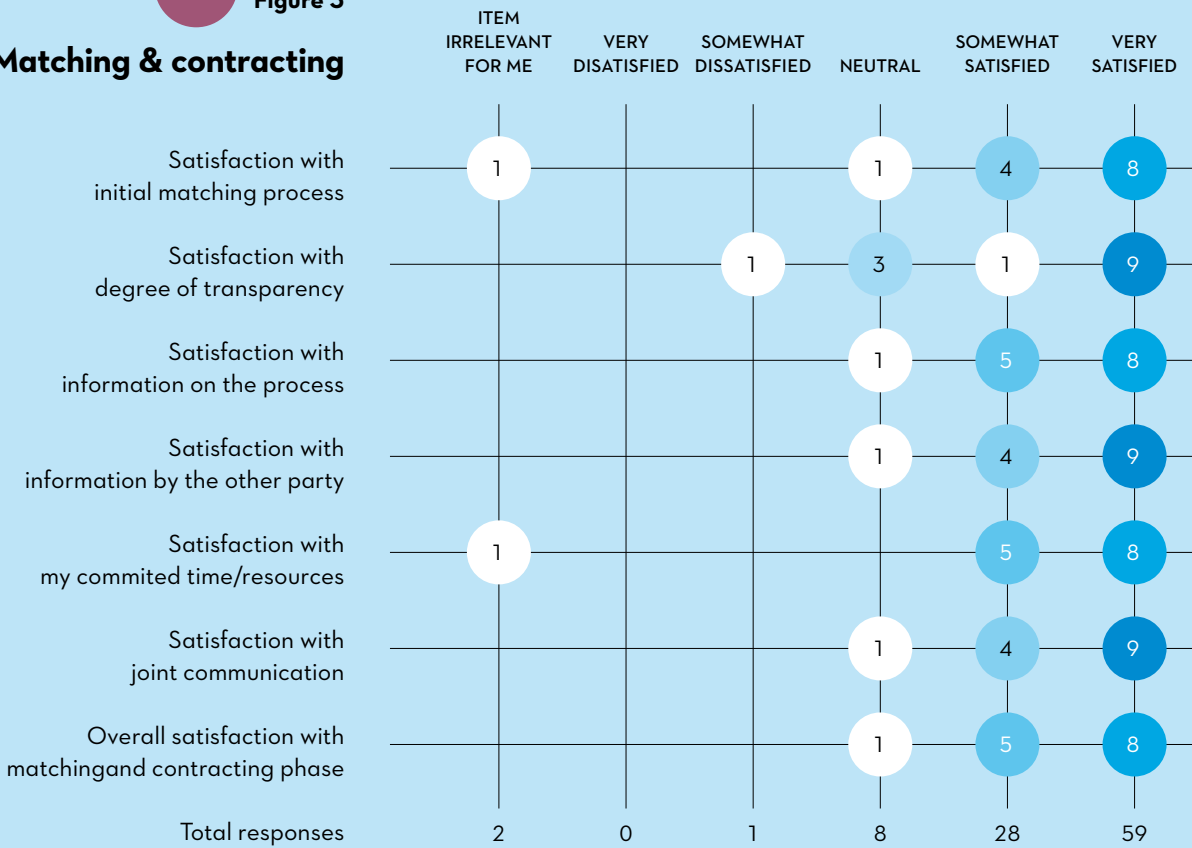
Matching & contracting



SME

Figure 3

Matching & contracting



Number of responses





The problem of finding a relevant SME was shared by almost all Living Labs in the project. This is an interesting finding when factoring in the conditions in this project, that allow the chosen companies to test their product or service in the Living Lab without having to pay. This finding furthermore substantiates the general problem amongst Living Labs as mentioned in the above section on the ProVaHealth project aim, in effecting a business model build on companies financing test activities.

Interestingly, and despite a high degree of complexity in the products tested, the SMEs included in the project did not find the matching and contracting phase to have been time consuming.



Contracting worked out very well considering that our case required special attention into information security and privacy

SME

Despite a willingness to engage in tests of complex products, the second cause for issues with time spend in matching and contracting seems to be issues with a diverting understanding of test needs. Specifically, the SMEs and Living Labs often had a rather short contracting phase, which could have benefitted from a more extensive dialogue.



We had difficulties in finding a product that could be tested in a regional Living Lab, as it was hard to find an interested department to undertake the test. We tried three different products before finding a product that could be tested.

Living Lab

With the SMEs included in the project, it was often found that a more extensive dialogue would have benefited the test overall, or that the needs of the product was not as described by the SME.



It was supposed to be a test of their solution but ended in a designing the test protocol for an updated product

Living Lab



We anticipated that their product was more mature than what we found it to be and the testing could have benefitted from a more extensive dialogue

Living Lab

Evaluation of work carried out

Related to the section of work carried out, both the SMEs and Living Labs were questioned on their satisfaction regarding the quality of work carried out, their commitment in the test and the product's or service's Technological Readiness Level (TRL).

Satisfaction with the quality of work carried out

This subsection focuses on the expectations and quality of work carried out, including the tests and/or workshops and the commitment from each participating party.

Related to the satisfaction with the quality of work carried out, both the SMEs and Living Labs were asked to state their level of expectations with the five phases as presented on page 16. In addition to these questions, the respondents were also asked to state the overall level of expectations and results of all five phases.

With six questions and 14 Living Labs involved in the project, the total number of responses in both of the matrices opposite is 84.

Overall, the project has seen a good match between expectations to the work and the quality found. With **46 somewhat or high expectations from the Living Labs and 44 from the SMEs**, the positive expectations to the work accounts for **55%** and **52%** respectively. These expectations are met, as **48** of the Living Lab responses and **50** of the SME response are positive. This yields a small increase to **57%** and **60%** satisfaction with the work carried out, when viewed from the perspective of the Living Labs and SMEs respectively.

Conversely, this entails three negative expectations by the Living Labs and just two Living Labs experienced a somewhat low quality in the work carried out. In addition, not all of the phases were in use in the work carried out; this includes **21%** of the responses for the expectations and **24%** of the responses for the results. For the

SMEs, there are four somewhat negative expectations and four very low ratings of quality in the work carried out. Again, not all of the phases were in use in the work carried out; this includes **12%** of the responses for the expectations and **11%** of the responses for the results.



Results and the project itself provided very good value in terms of insights and evaluation gathered

SME

Recruitment

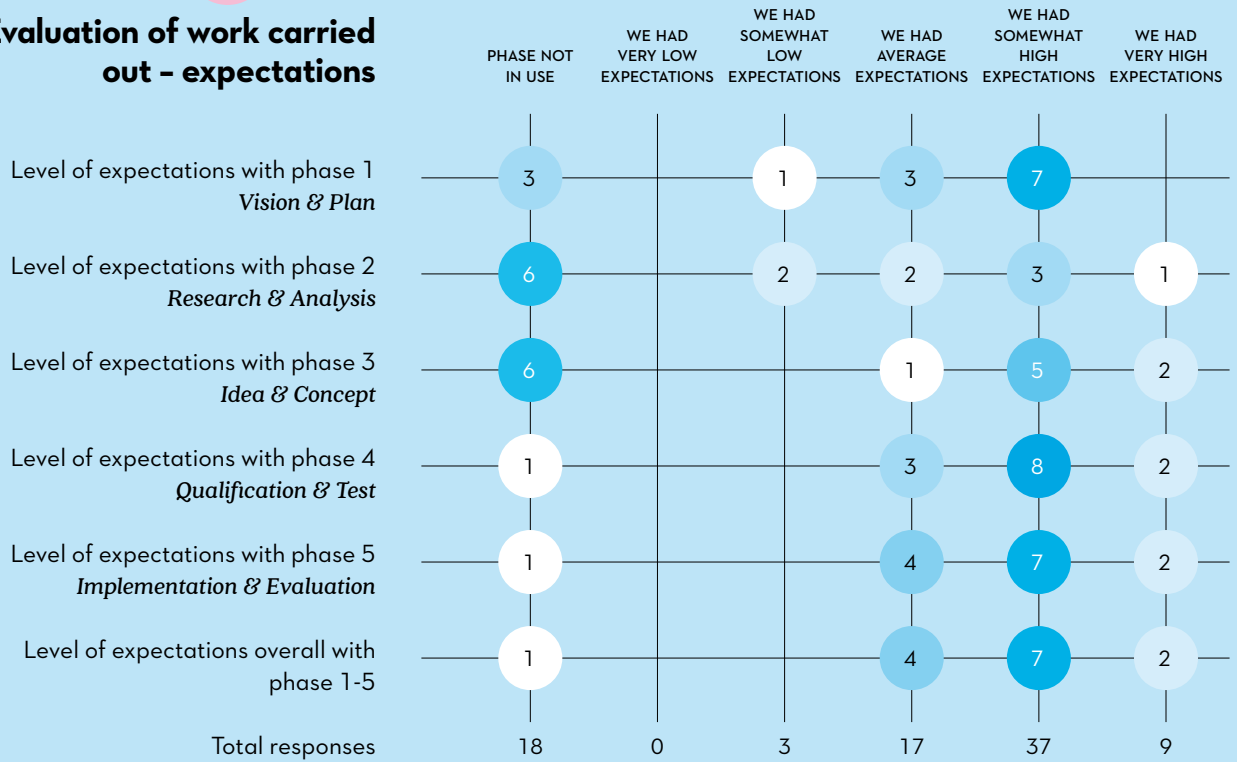
The small increase in the Living Labs satisfaction, can be explained by the Living Labs being the organisers of the work carried out, and they had a good feeling of what was going to happen, and this could explain the small variations between expectations and results. However, the SMEs have the largest increase in the negative ratings, going from four somewhat low expectations to four very low ratings, compared with the Living Labs going from three somewhat low expectations to two. The SMEs very low ratings throughout the different phases are likely due to one SME who was not satisfied with the work carried out.

The question regarding the expectations and results in Level 4: Qualification & Test, decreases from 10 positive ratings to seven in the Living Labs perspective, and the neutral and negative ratings increases consequently. The Living Labs site recruitment of test persons and feedback from test persons to be the biggest obstacles for the test process to proceed smoothly. Consequently, this is found reflected in the Living Labs responses to the question of Level 5: Implementation & Evaluation in which the negative rating is slightly increased.

LIVING LAB

Figure 4

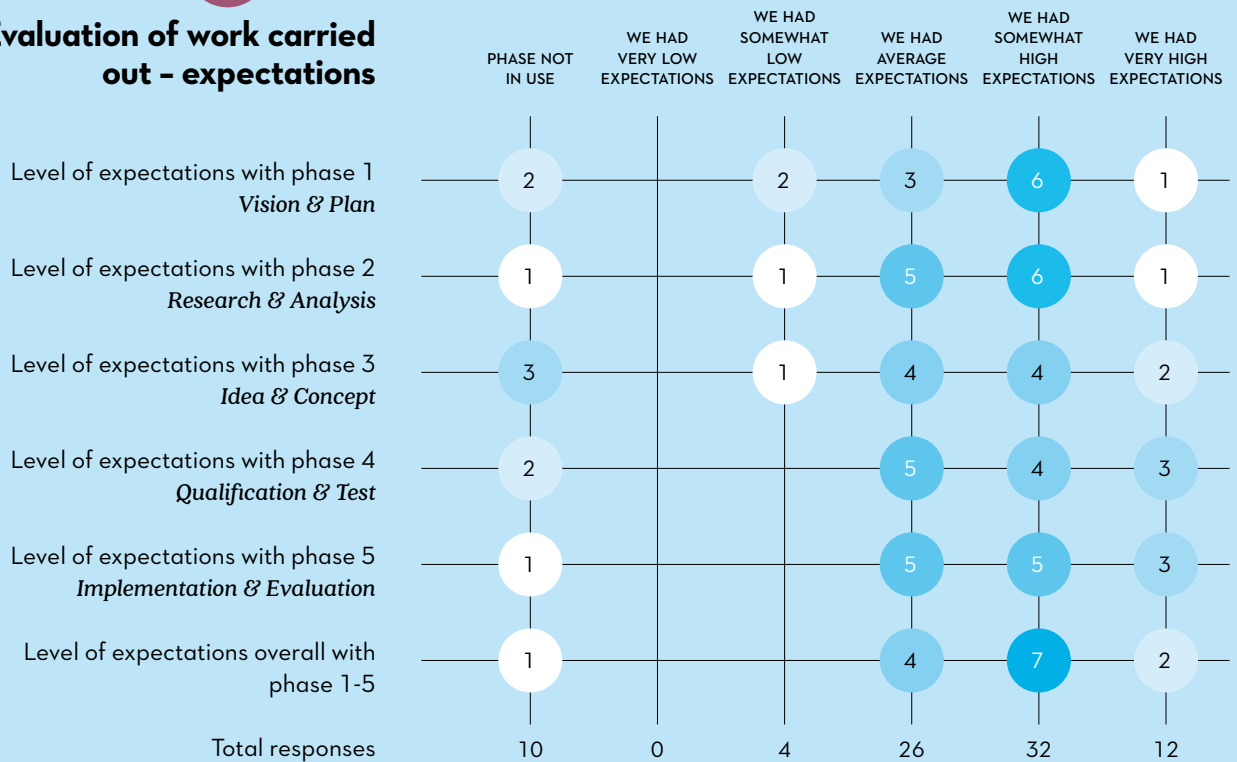
Evaluation of work carried out - expectations



SME

Figure 5

Evaluation of work carried out - expectations



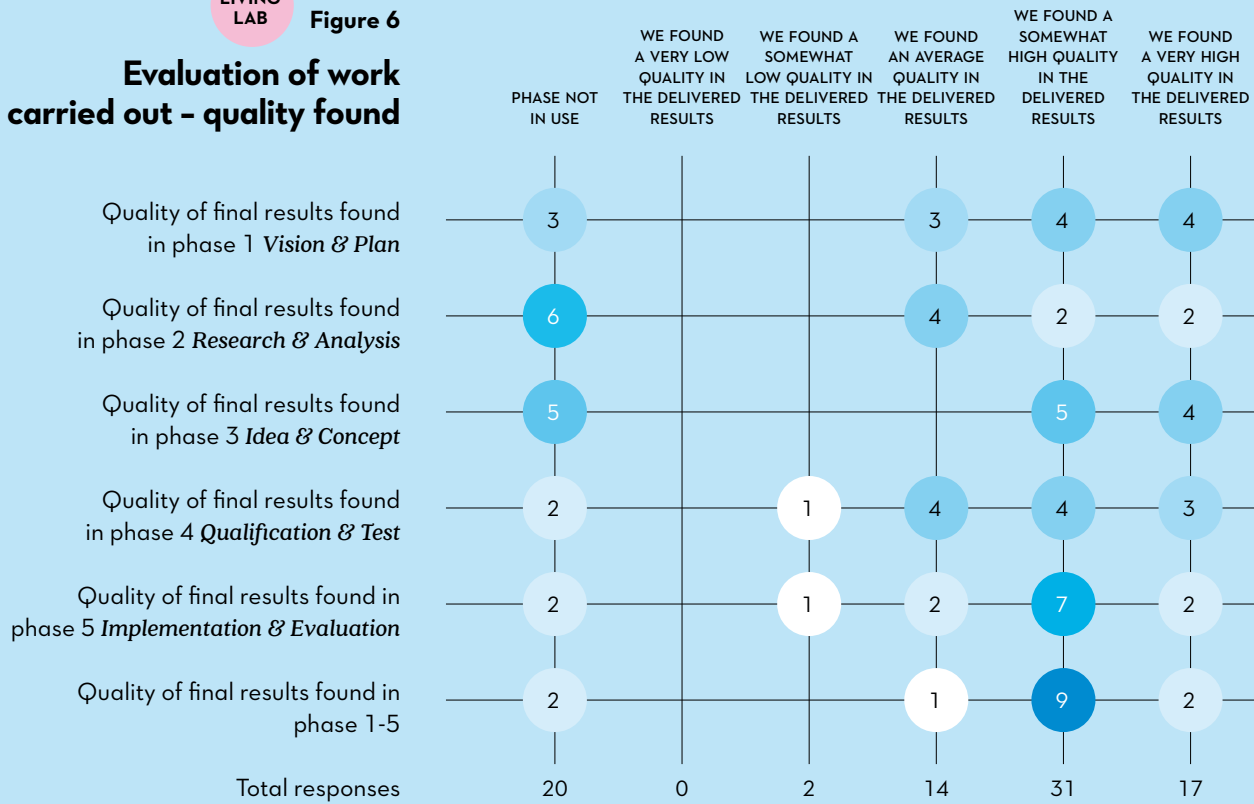
Number of responses



LIVING LAB

Figure 6

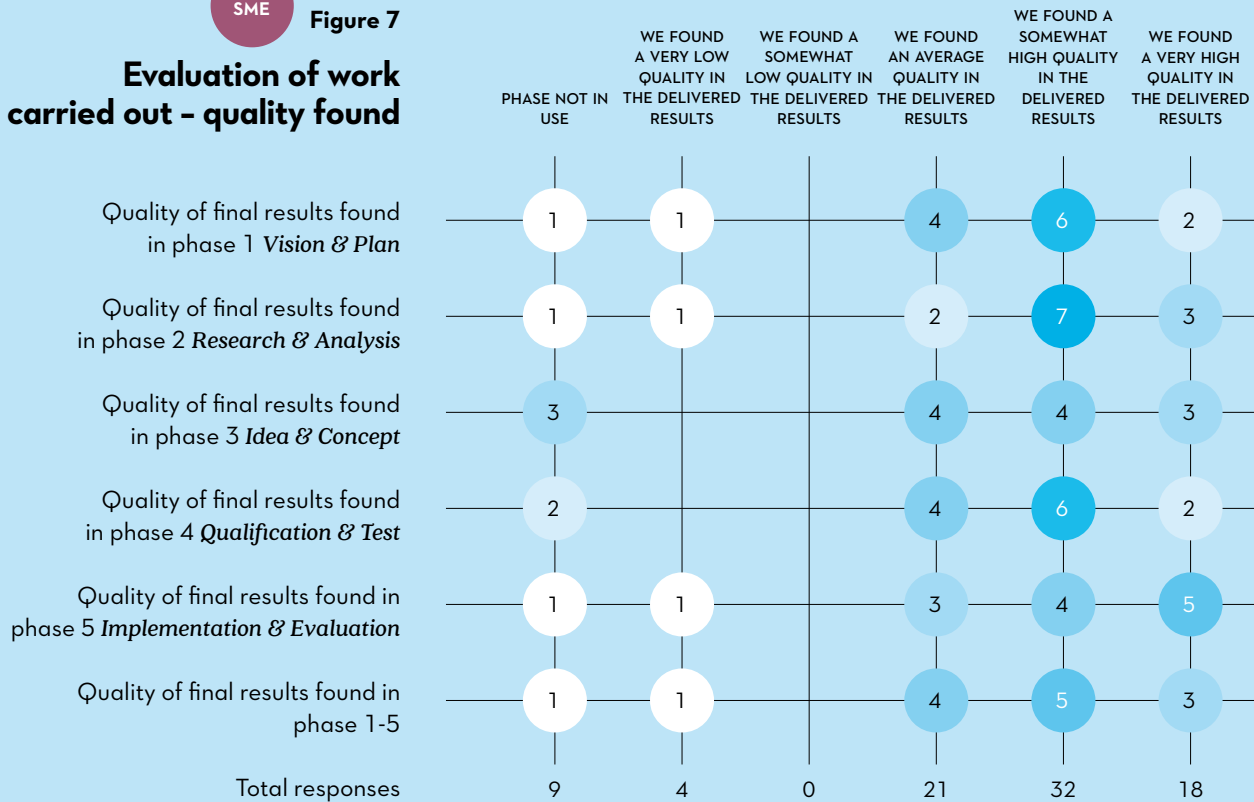
Evaluation of work carried out - quality found



SME

Figure 7

Evaluation of work carried out - quality found



Number of responses





... our services as a Living Lab were negatively affected by illness with the test persons. This reduced the amount of data generated for the analysis. Also, the test persons did not provide as many personal feedback comments as had been hoped for and thus, the data documentation provided by us was less than expected and therefore less satisfactory from a test perspective.

Living Lab

Phase not in use

The preceding work carried out in each phase was agreed upon in the contract between the matches. Thus, the amount of responses in the 'phase not in use' should be the same when comparing SMEs and Living Labs responses. However, as the Living Labs responded with 'phase not in use' 20 times, and SMEs only nine, there is an obvious and large difference.

Specifics on matching between expectations and outcomes

As seen in the figures opposite the mean score associated with expectations to and quality found with each of the five phases, as well as the overall process remain high and closely related. With the difference found in each phase for both SMEs and Living Labs remaining low, it is concluded that, generally, expectations to and quality found with each of the five phases are met. As seen opposite, there are differences in the mean value of both expectations and quality found with regards to each phase, but as these are minor, no further conclusion are based on this.

When investigating the specific relationship between expectations and outcomes, it becomes clear that while most of the SMEs and Living Labs achieve their expectations, some are either significantly positively surprised or disappointed with the quality found.



*Unfortunately,
I never got any concrete
test results*

SME

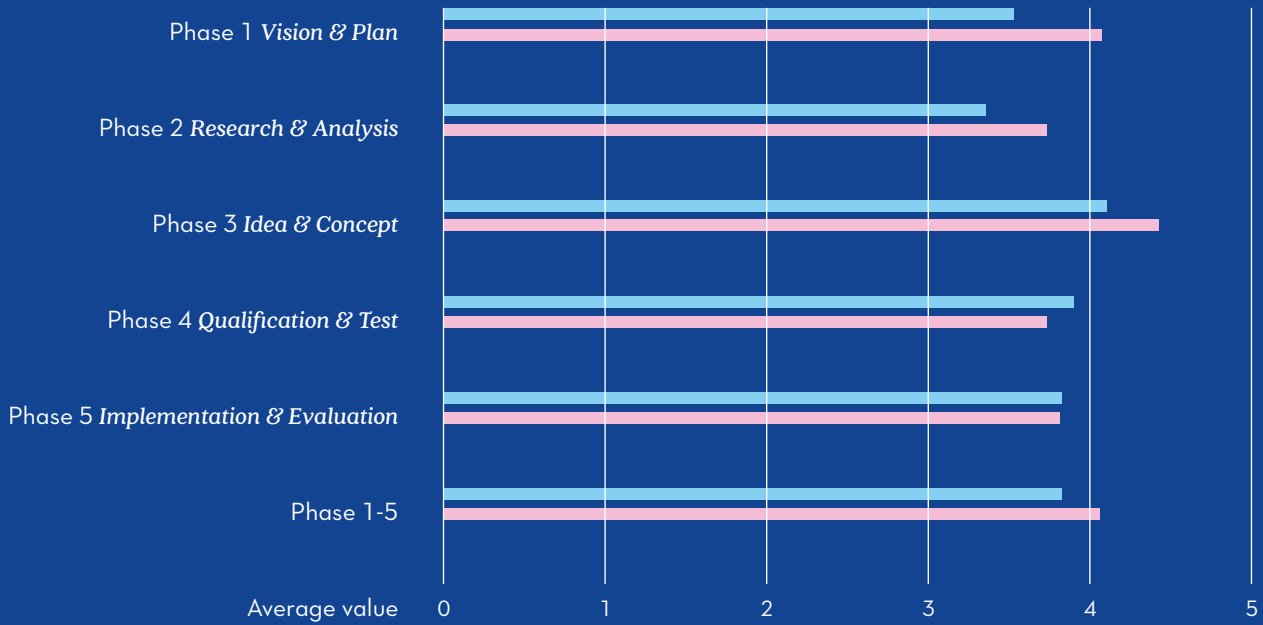
The below heatmap shows the correlation between expectations and quality found within each phase. If an SME or Living Lab had — somewhat high expectations to work concerning implementation and test, which would be Phase 5, and found — very high quality, this would result in a score of 1, as the quality found was one rank higher than expected. For both the Living Labs and SMEs, there are 84 responses.

For the Living Labs, 72 or 85% indicate that expectations were met or exceeded. The same applies for 67 or 80% or the SMEs. While there is some difference is the level of satisfaction, a general level of 80% to 85% is very high and satisfactory.

It is worth noting that a lower quality found in one phase can be translated in to a higher in another, due to a misunderstanding of the phases. Due to this, and the low difference in variations in responses when comparing one phase to another, no other conclusions are drawn from this data.

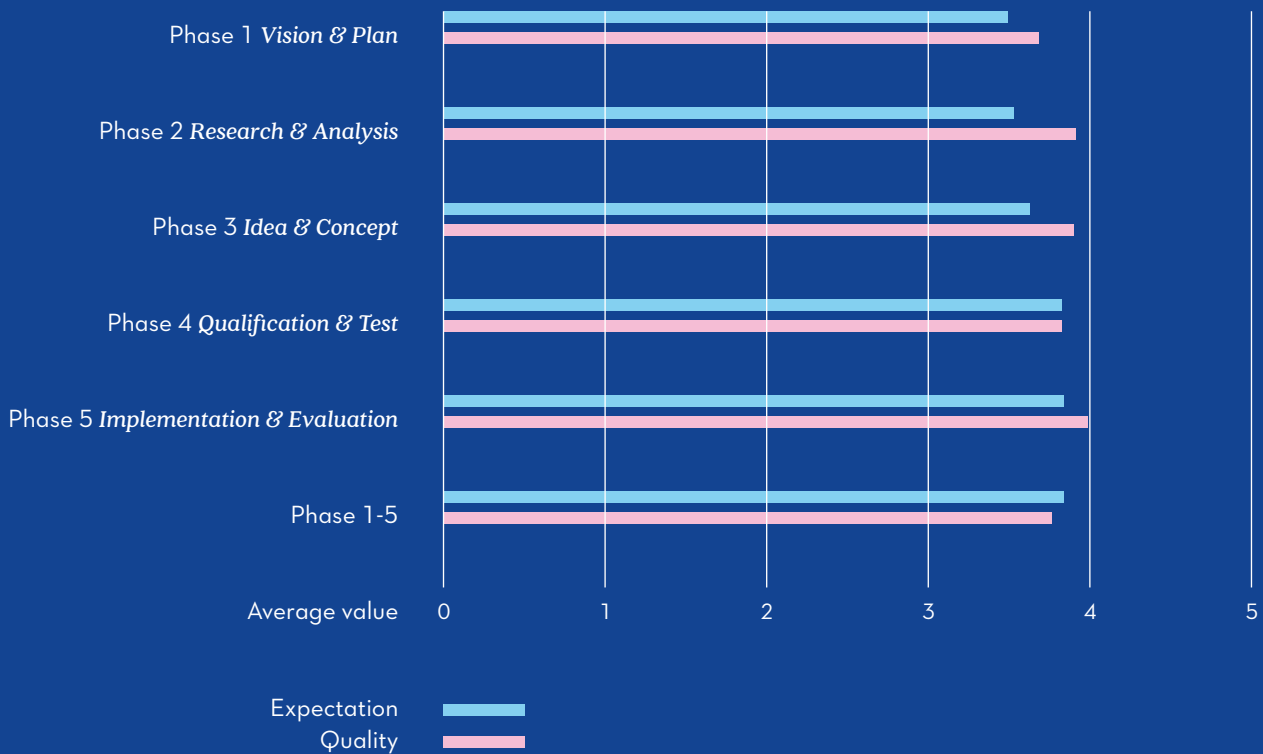
LIVING LAB Figure 8

Comparing expectations with quality found



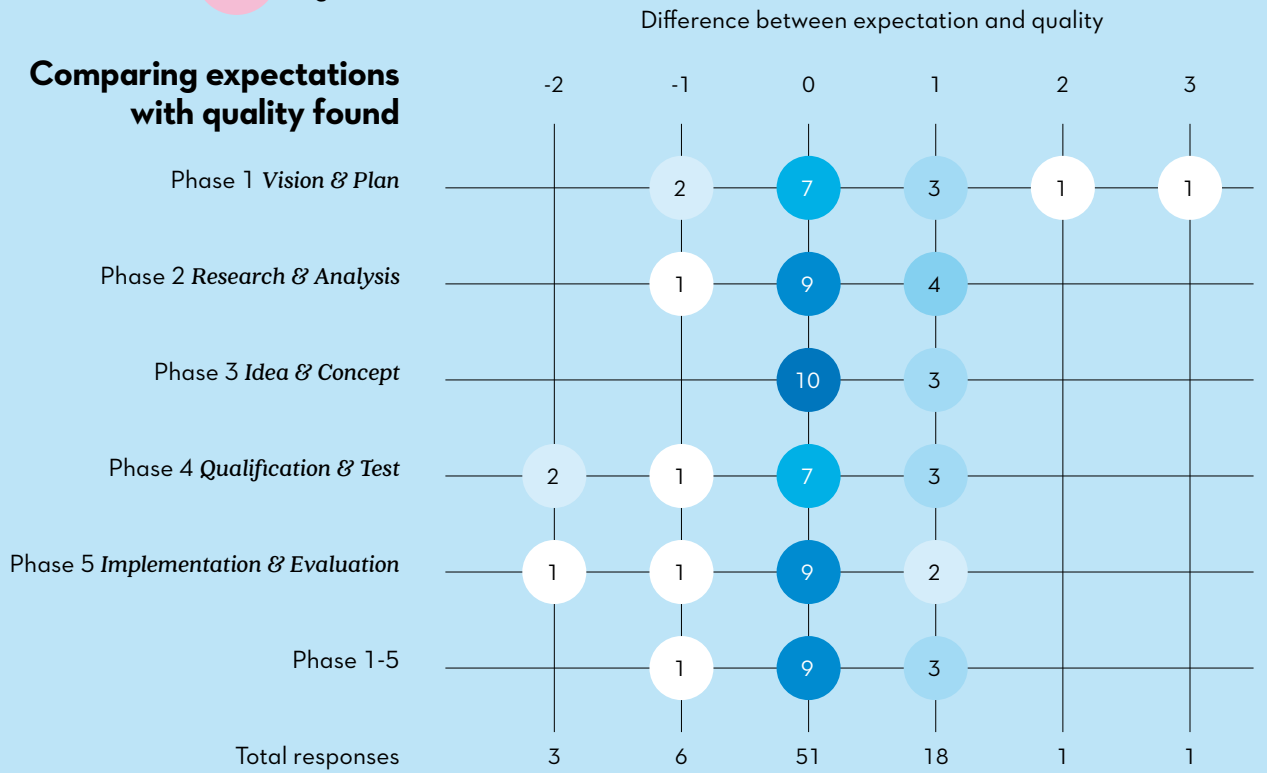
SME Figure 9

Comparing expectations with quality found



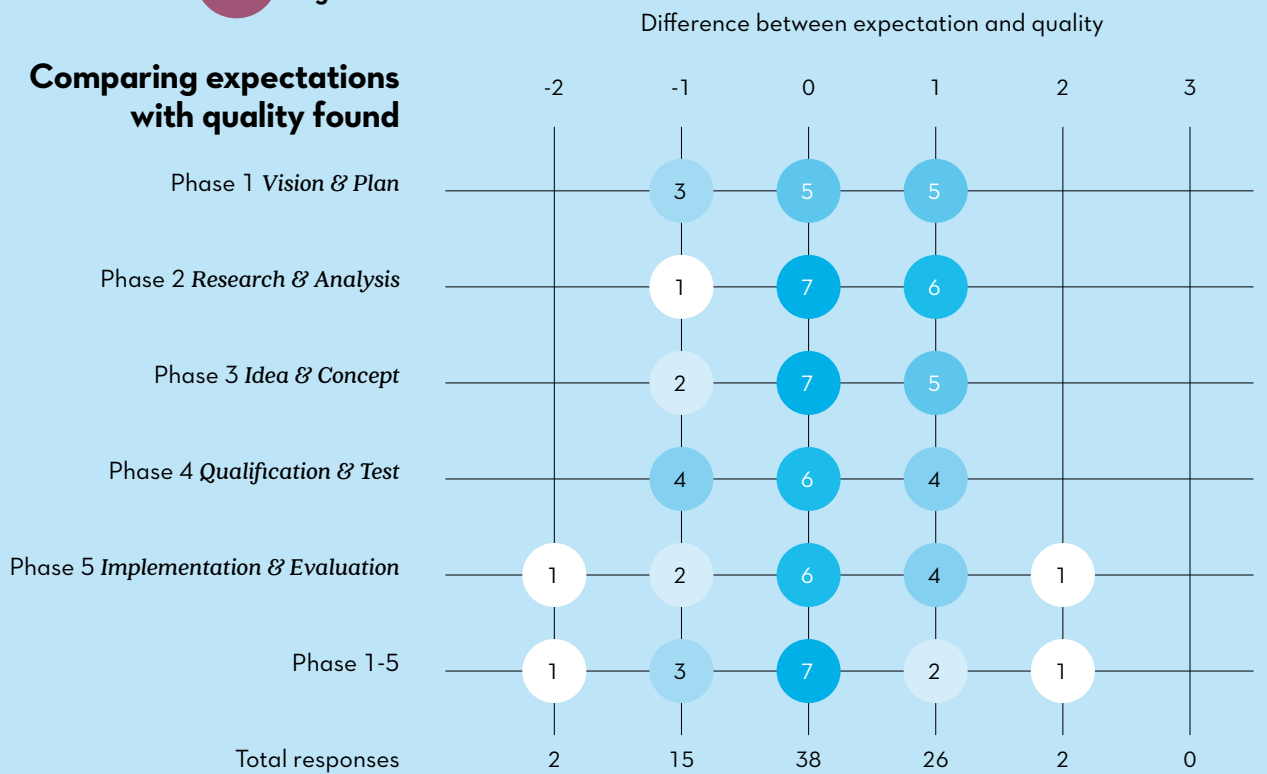
LIVING LAB Figure 10

Comparing expectations with quality found



SME Figure 11

Comparing expectations with quality found





Satisfaction with physical test or workshop

Nine of the 14 pilots included a physical test or workshop. Both the SMEs and Living Labs were asked to evaluate the other party's activity during the test, if the facilities accommodated the test, if the programme for the test was adequate, if the test included the expected number of users, if the product's target group was present during the test, and if the recruitment of participants were without issues. In addition to these questions, the Living Labs and the SMEs were also asked to evaluate the overall satisfaction with the test.

While there are **61 responses from Living Labs** and **70 from SME**, there is a **77%** satisfaction with the physical tests for both groups. With just two negative ratings in the SMEs dataset, the reason for the less than 100% satisfaction is found in the use of 'I don't know / not in use'.

While there are some differences in the level of positive satisfaction when comparing the responses from Living Labs to those from the SMEs, the differences are not to a degree, which warrant other or more specific conclusions.

Recruitment and participation

The SMEs are overall more positive than the Living Labs in their responses, except for the question regarding the presence of the product's target group. The recruitment was handled by the Living Labs, and their recruitment may have been slightly skewed towards the intended target group. The product could include a rather large target group, and the participants in the test could be a niche of the large target group.



... this personnel could be a target group for the product, but not the most important one.

Living Lab

20% of the answers by the SMEs were rated as 'I don't know / Not in use', in comparison to only 10% of the Living Labs ratings. Five out of the six responses ratings by the Living Labs were placed at the question regarding the recruitment of participants, mainly because there was no recruitment needed. However the SMEs use of the 'I don't know / Not in use' rating can be explained by the Living Labs being the organisers of the test and/or workshop. Thereby excluding the SMEs from knowing about the specific process, e.g. recruitment of participants, or the SMEs not being present during the test and therefore having no knowledge of the specific process.



The company was not present during the testing period where Living Lab staff tested software. This was not necessary. They were present at an introductory meeting, during installation of software to be tested and at a final evaluation event.

Living Lab

The question regarding recruitment is significant because seven of the SMEs rated that they strongly agreed on that the recruitment went without any issues. However only two of the Living Labs agreed or strongly agreed on this statement, which indicates that the Living Labs either have had some issues with the recruitment or that no recruitment was necessary for the test.



... our region's services as a Living Lab were negatively affected by the fact that two out of six test persons had to go on sick leave just before the test of the product was to begin. This reduced the amount of data generated to be used for the analysis ... It was not possible to mobilise another two persons at short notice. ...

Living Lab



We didn't have external participant during the event

Living Lab

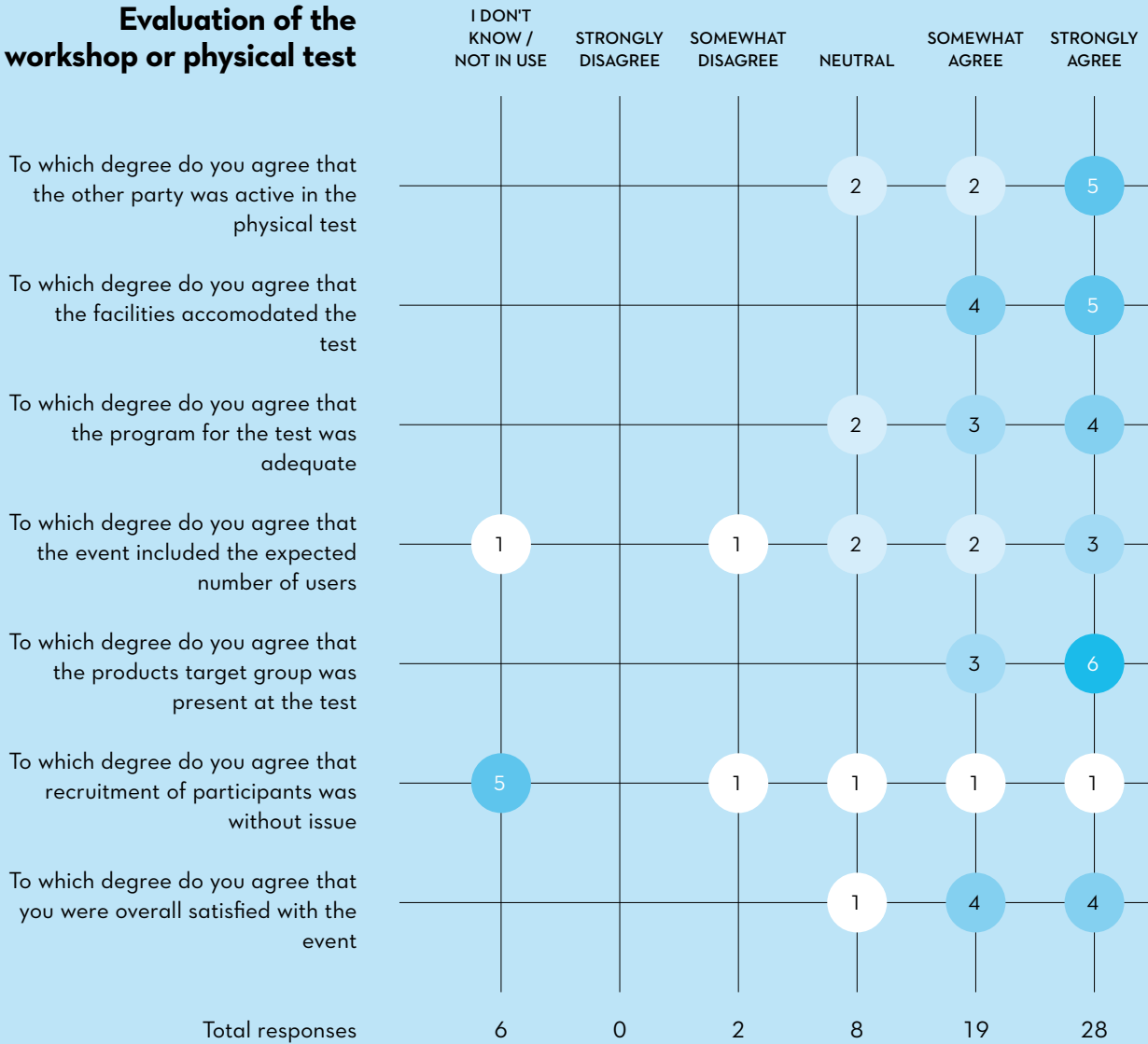
In addition, the amount of users present was overall satisfying to both parties, but with Living Labs having one negative and two neutral responses, compared to eight positive responses from Living Labs, there is a slight difference in satisfaction. Concerning the representation of the product target group at the event, the SMEs were slightly but significantly more satisfied with the amount of users than the Living Labs.

While the Living Labs were responsible for recruitment, — number of users is better understood if viewed as satisfaction with — outcomes from user test, which would allow for significant value from a small number of users rather than applying a view of — more users provide better insight. While a large set of users may be valuable, a single participant's ability to convey their experiences and desires may be several orders of magnitude more valuable. In this regard, anecdotal evidence from interviews with a limited number of SMEs involved suggests that the participation of a limited amount of users which are relevant, engaged and precise was far preferable to larger amounts of users.

LIVING LAB

Figure 12

Evaluation of the workshop or physical test



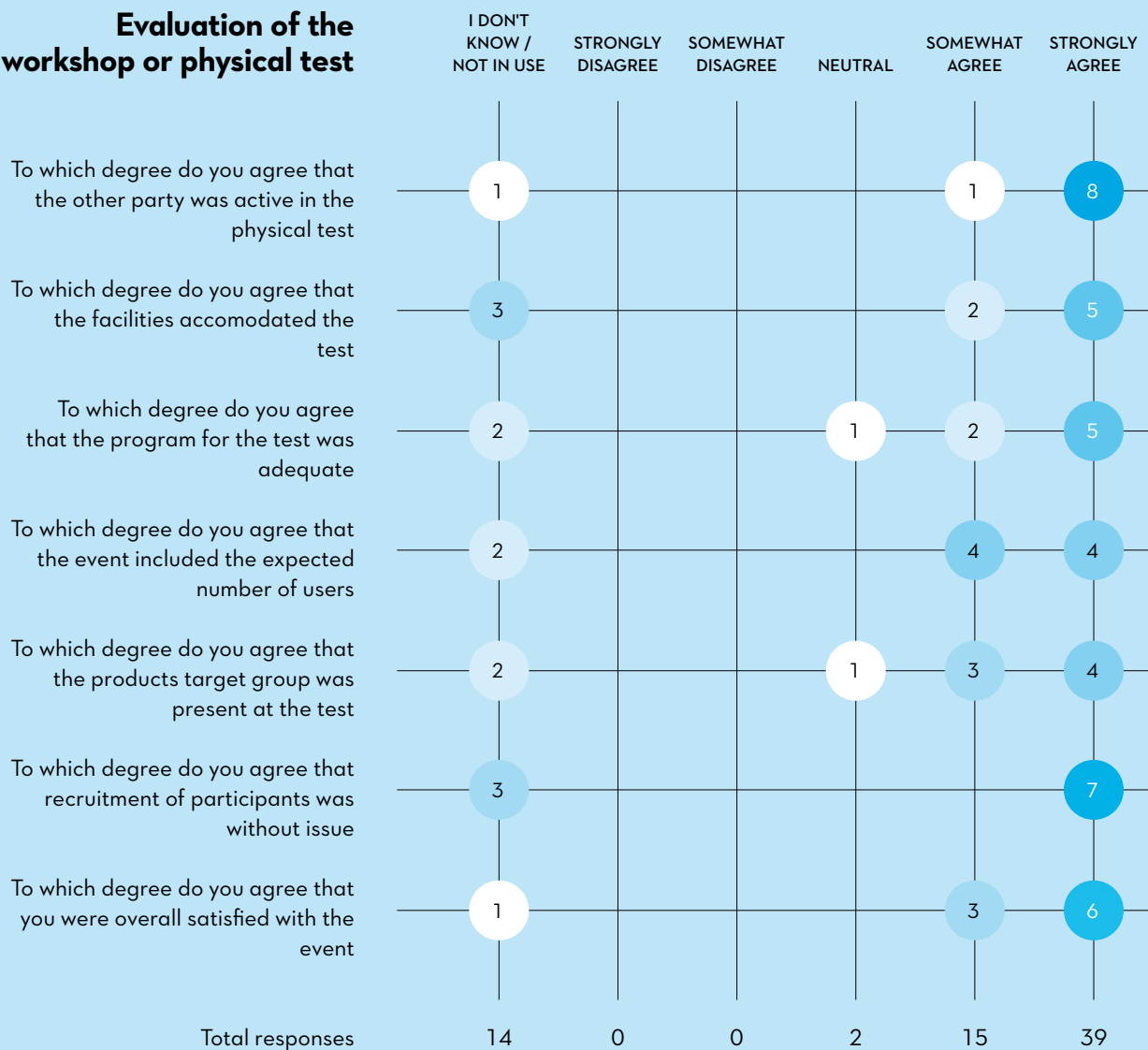
Number of responses





Figure 13

Evaluation of the workshop or physical test

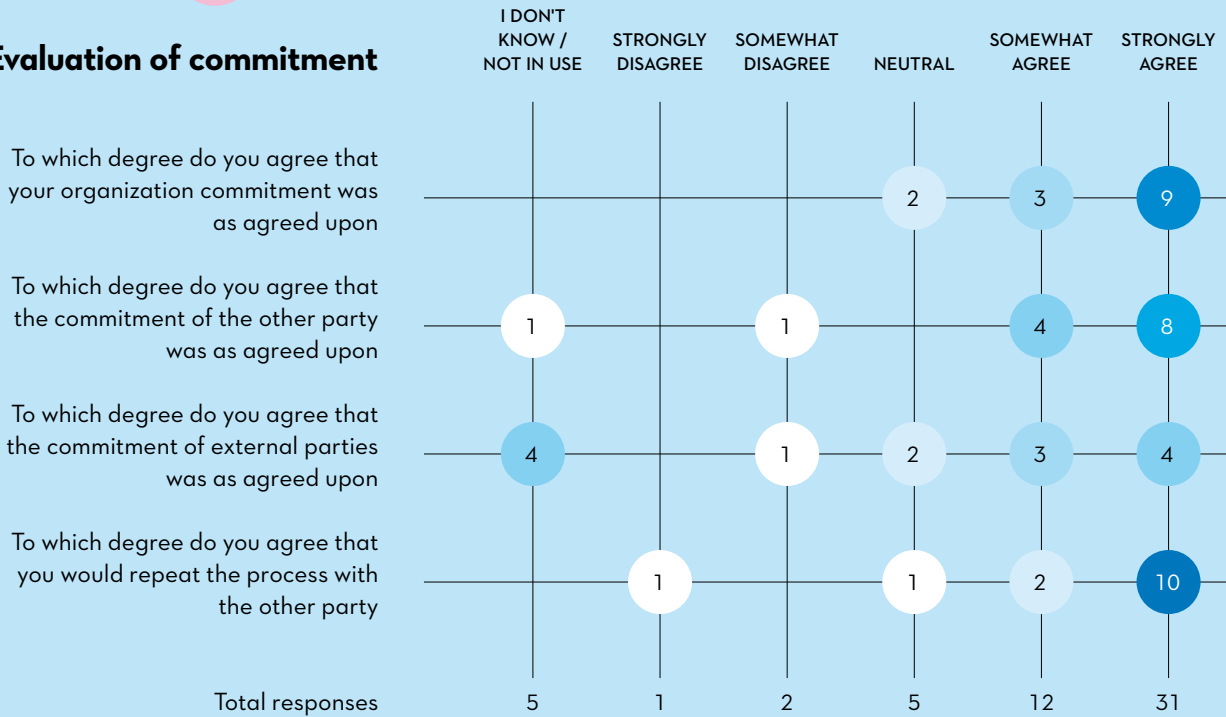


Number of responses



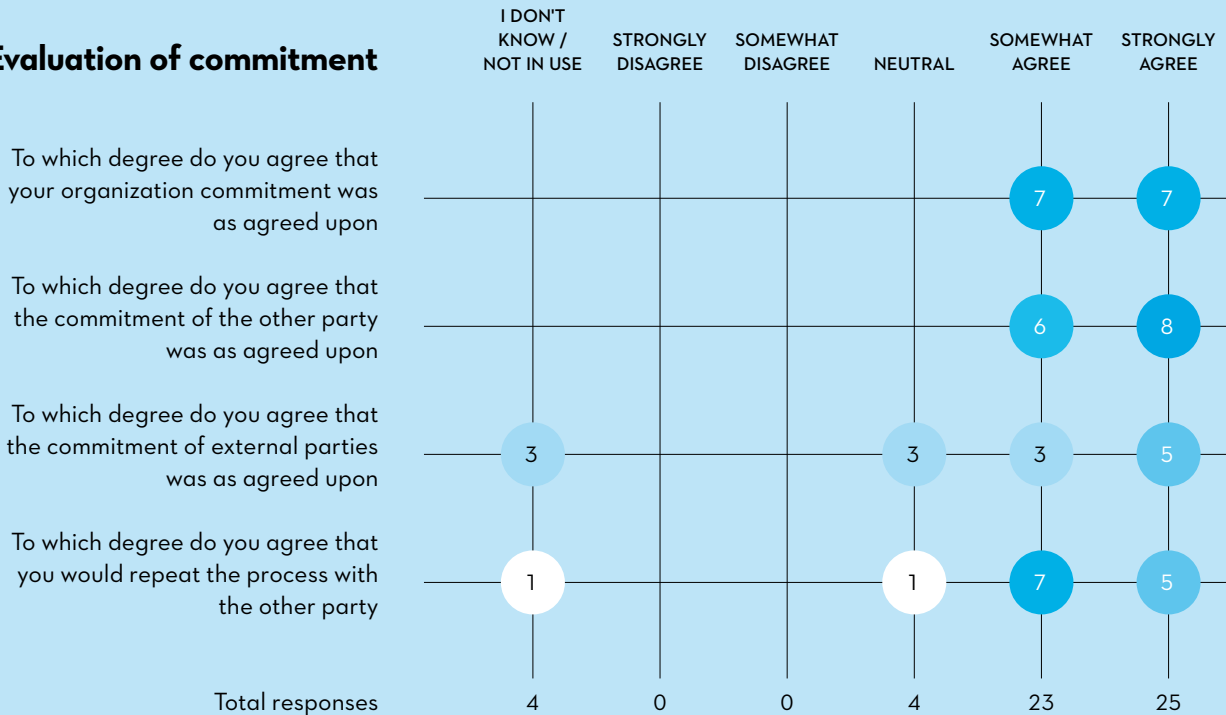
LIVING LAB Figure 14

Evaluation of commitment



SME Figure 15

Evaluation of commitment





Commitment

Related to the theme of commitment, both the Living Labs and the SMEs were asked to evaluate the commitment of the other party, the commitment of the external party, if any such participated, and if they wanted to repeat the process with the other party.

Out of 56 responses from both Living Labs and SMEs, 43 of the Living Labs and 48 of the SMEs responses evaluated the commitment as positive.

With three negative responses from Living Labs and none from SMEs, the overall level of satisfaction with commitment is considered very high and satisfactory.

When considering the individual questions, only the aspect of repetition of the process reveals major differences in responses. While both the SMEs and Living Labs would repeat the process, there is a significant difference in 10 of the 14 Living Labs strongly agreeing and two somewhat agreeing to this, while this is mirrored with five and seven respectively for SMEs. Thus the level of satisfaction is still high, but is lower for the SMEs



The test was performed in a professional way and with dedicated personnel. We are very satisfied and the testing is of high value for the company

SME



After the trust was build the commitment enhanced.

Living Lab

Technology Readiness Level

The purpose of this section is to provide an overview of how the Technology Readiness Level (TRL) of the included products was affected by the tests in Living Labs.

Related to the TRL, both the Living Labs and the SMEs were asked to state their product's or service's TRL before and after the test. This was done in an effort to evaluate any development acceleration done in the Living Lab test. With the tests ranging significantly in length, nature and type, as presented in the appendix, a change to TRL cannot be expected with all tests, and thus is not considered as a criteria for success of satisfaction with the test.

The figure opposite shows how Living Labs and SMEs respectively rate the product or service for testing, before and after time of test. With two questions and 14 Living Labs and 14 SMEs involved in the project, the total number of responses in each question in the above matrixes is 14 for each of the four rows.

Overall, the project has seen an increase in the TRL of approximately 1 point across all 14 tests. From the SMEs point of view the mean TRL level is 5,07 before time of test and 6,1 after time of test. From the Living Lab perspective the mean score 5,4 and 6,5 respectively.

Definition of TRL

TRL 9	The final operational version is thoroughly demonstrated through normal operations, with only minor problems needing to be fixed
TRL 8	Operation is as intended and demonstrated without significant design problems
TRL 7	A final prototype has been developed
TRL 6	A near final version is tested in real-life conditions
TRL 5	Basic prototype is validated in a relevant environment
TRL 4	Basic prototype is validated in a laboratory environment
TRL 3	Concept or application is proven through analysis or experimentation
TRL 2	A concept or an application is formulated
TRL 1	Basic research is done

Figure 16

LIVING LAB

Technological Readiness Level (TRL) compare

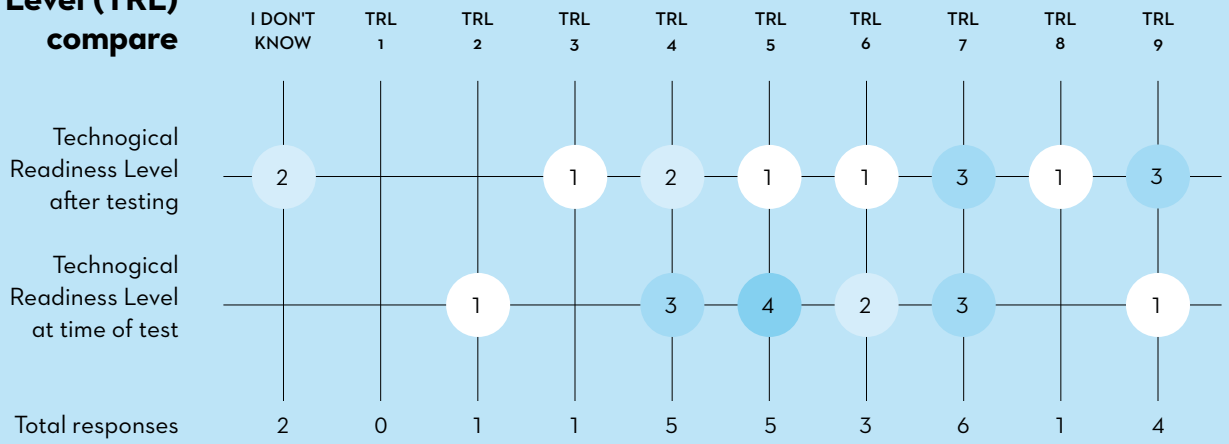
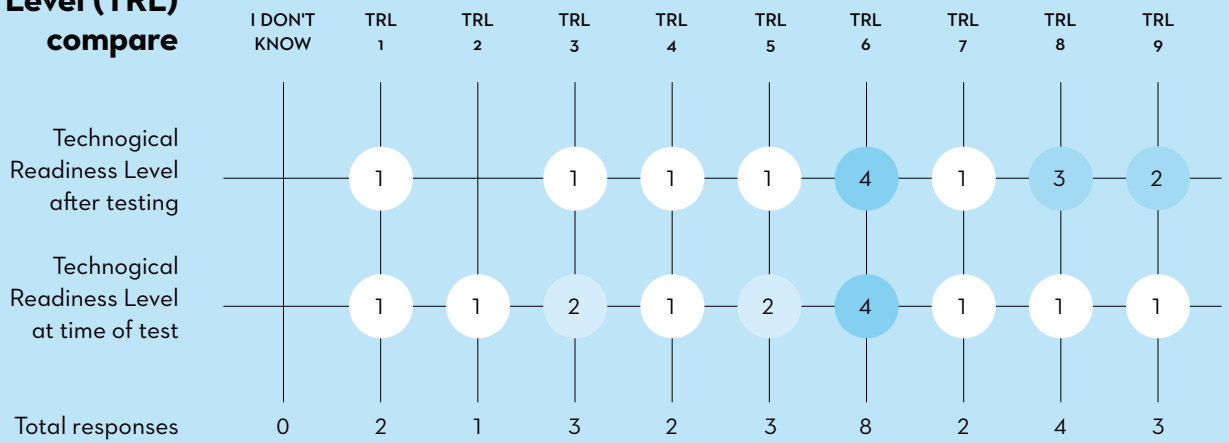


Figure 17

SME

Technological Readiness Level (TRL) compare

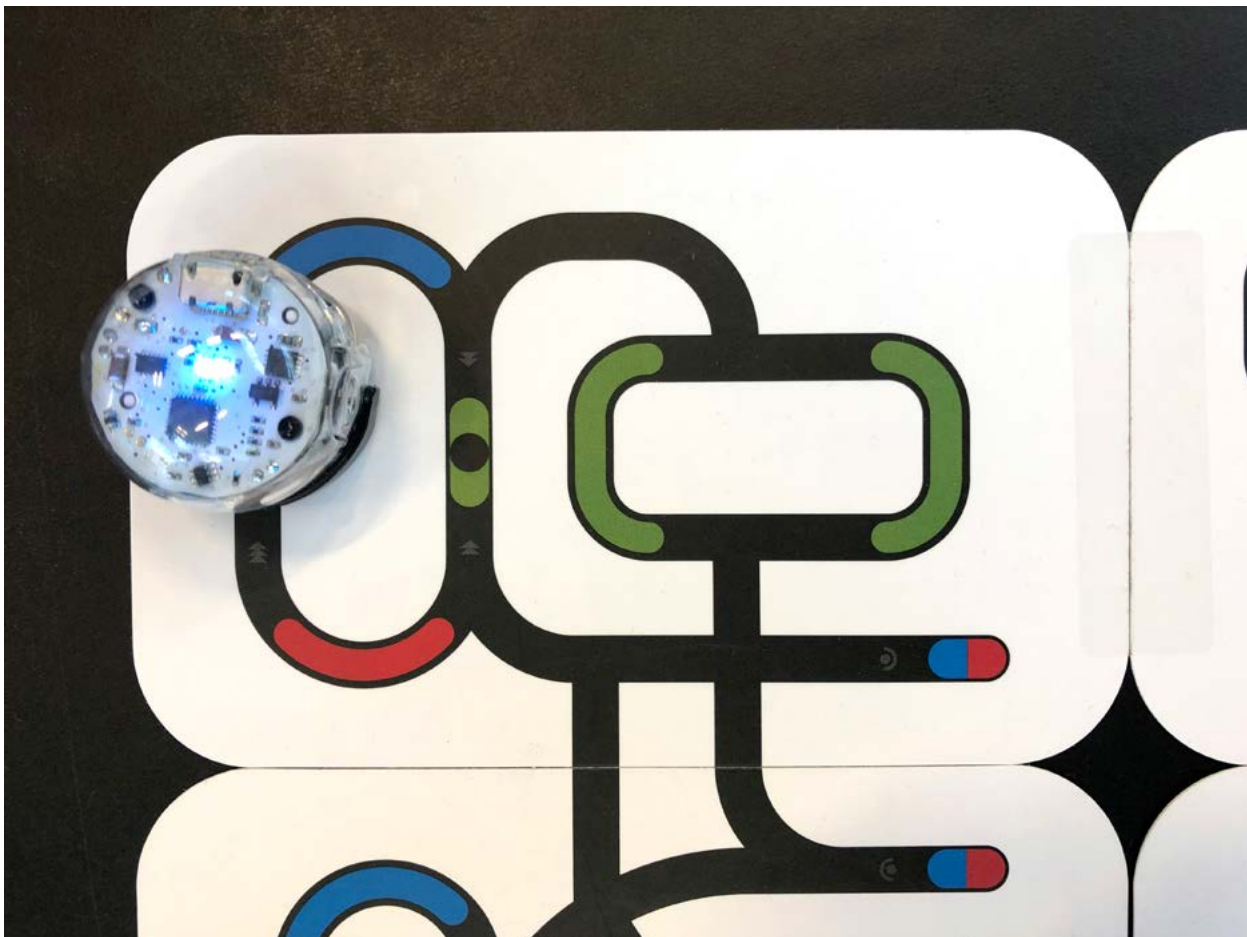


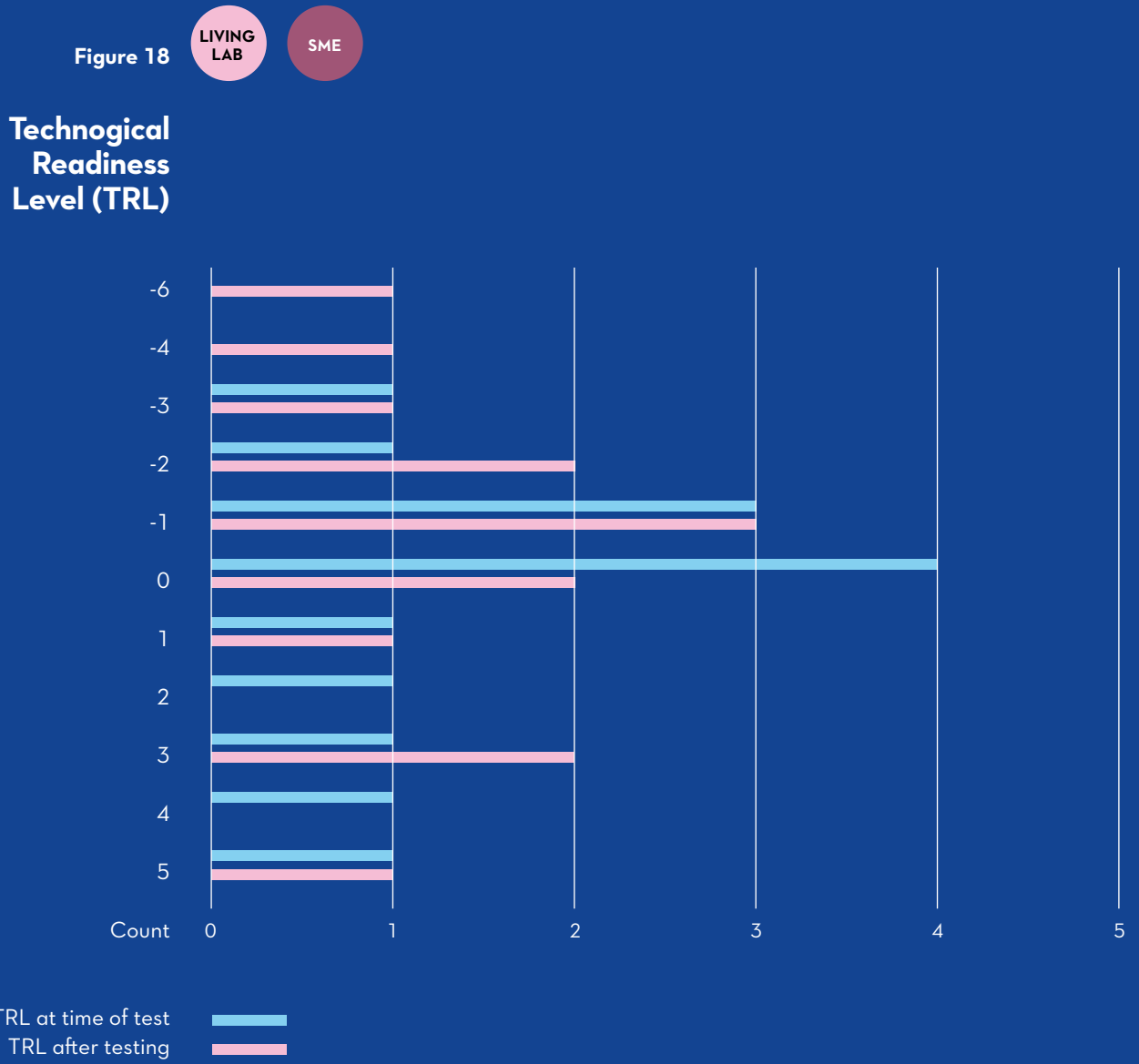
SMEs rate TRL higher than their associated Living Lab

When analysing the data further, it becomes clear that while there is a comparable mean increase in TRL across the 14 tests. When looking at the SMEs and Living Lab ratings, the specific ratings vary significantly when isolating the ratings to each of the 14 pairs.

The figure opposite shows the difference between TRL ratings when comparing the pairs of test to each other. In cases where SMEs rate higher than Living Labs, the value is negative and in the reverse case of Living Labs rating higher than SMEs, the value is positive. This allows for comparing the overall ability of TRL assessment of SMEs and Living Labs, rather than simply isolating the difference in assessment.

Overall, SMEs rate TRL higher than their associated Living Lab five times at time of test, and eight times after the test. Conversely, Living Labs rate highest five times before testing and four times after. Most significantly, the TRL was rated the same by Living Labs and SMEs 4 times out of 14 at time of testing. This would suggest that either the parties are not able to correctly rate the product or service, or they have a different opinion on the maturity of the product, even after contracting and possibly testing has been made. Additionally, the figure shows that both at the time of test and after testing, three SMEs have rated the TRL level one point higher than their associated Living Lab. Interestingly, the difference in TRL rating remains approximately the same before and after testing when evaluating across the 14 pairs. This is not shown in the presented data opposite, but is visible in the raw data.





Future perspectives

The above sections regarding Matching & Contracting and Work Carried Out both refer to the actual processes encompassed by the collaboration between the respective SMEs and Living Labs. As an addition, the evaluation also investigated the SMEs future perspectives in terms of the SMEs plans for future Living Lab collaboration.

This was investigated by questions in the likelihood of repeating the process knowing what they did by the end of the test, having a second collaboration with the same Living Lab, collaborating with other Living Labs and whether or not there were concrete plans for Living Lab collaboration at set time.

Overall, the heatmap opposite provides a significant positive result for the involved Living labs. Out of 56 responses to questions on future collaborations, 46 or 82% are positive and just four are negative. 86% of the SMEs agree that knowing what they know now, they would repeat the test process. 71% were positive towards working with the same Living Lab again. 42% have some sort of concrete plans for future collaboration. While one SME strongly disagree that they would work with the same Living Lab again, and three strongly disagree that there are concrete plans, these responses must be evaluated in conjunction with the satisfaction with work done. In this light, the use of strongly disagree is better understood not in place of — Would never do so, but rather — No plans at this time, and thus not directly be seen as a negative result per se.

A transnational collaboration regarding co-creation and development is in most instances a complex process with many associated risks. It is therefore interesting that as much as 86% of SMEs are positive towards repeating the process, knowing what they did at the conclusion of the collaboration. This is a clear indication of a positive experience throughout the process. It could furthermore be taken as indicative of Living Labs as value creating for SMEs — also in a transnational setting. The above is furthermore substantiated by 42% of SMEs having some sort of concrete plans for future collaboration, as early as at the end of the collaboration framed within this project.



I think the ProVaHealth project makes a lot of sense. Indeed, it would be much harder for us to arrange user testing in other countries. During the preparations, we learned a lot about our product and what needs to be done in the future.

SME



It was a positive experience that yielded good results.

SME



Participation and results were really insightful and useful.

SME

The two parameters of repeating the process and having a new collaboration with the same Living Lab is somewhat similar, which make the deviation of 15 % in positive answers between questions, stand out. The cause for the deviation is most certainly multifaceted, but the evaluation points at several factors. All SMEs are in a development phase, and the collaboration will have furthered the SMEs product development, understanding of their product or insight into the target group or market. The deviation could therefore be indicative of the SMEs having other needs for the next development phases, which cannot be supported by the respective Living Lab. Equally possible, the SME could be investigating expansion into other markets; hence relaying on local collaborations in these markets, or the SME have to rethink their product due to new insights gained.



We would be looking more into German, UK, or Russian users next time

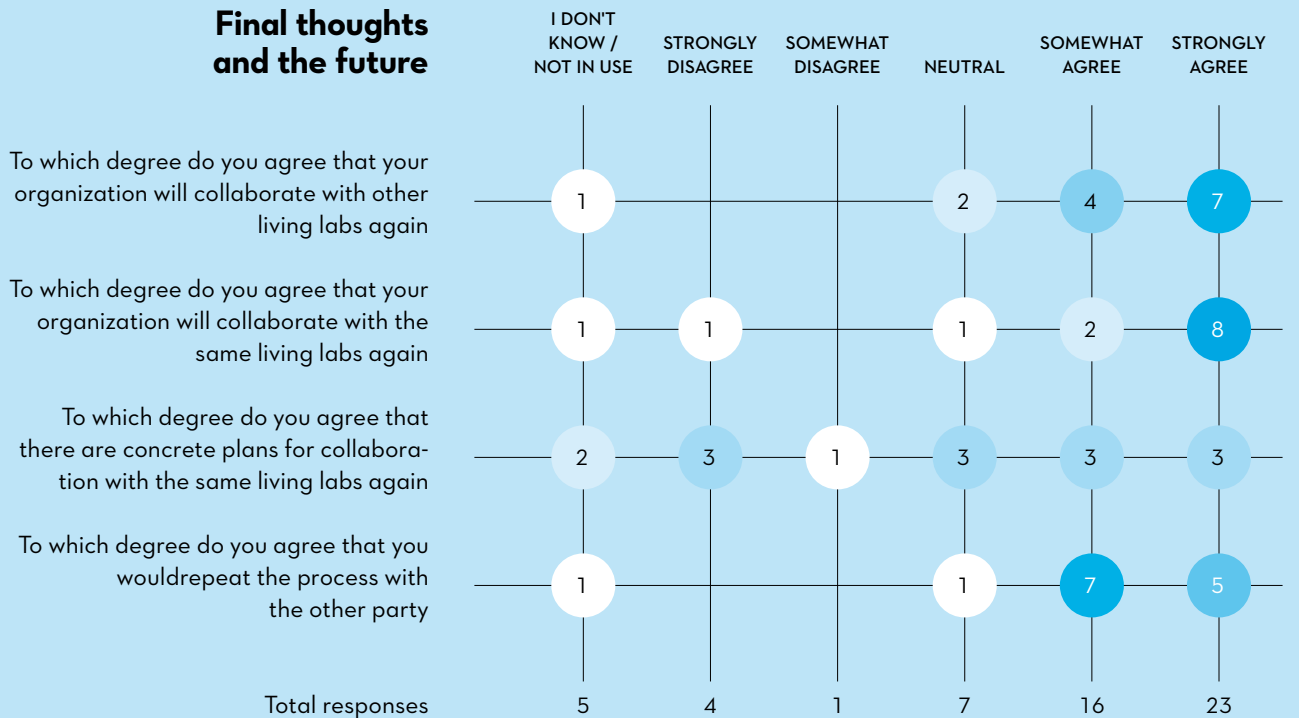
SME



Living Labs is a great way to get unbiased feedback and support

SME

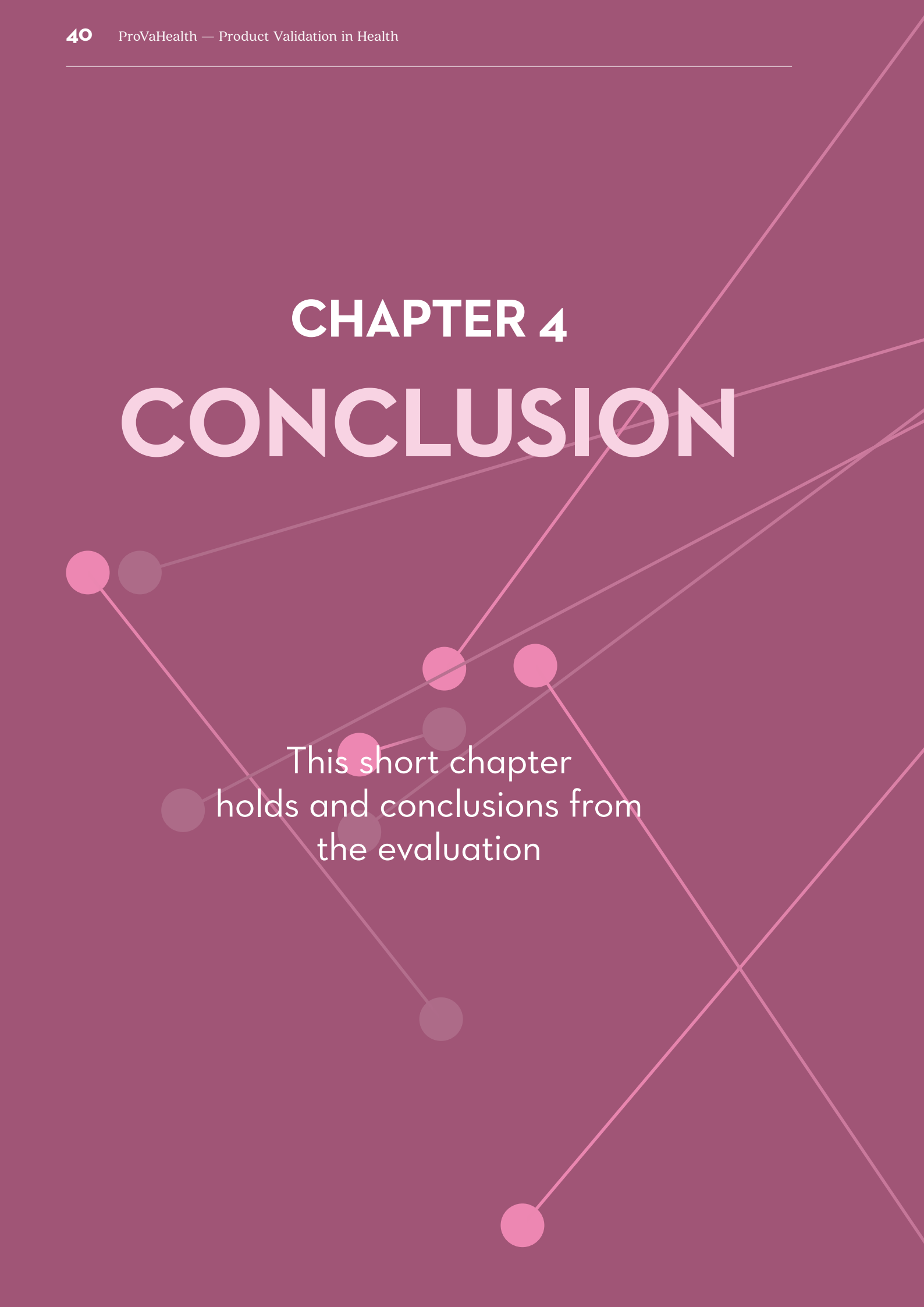
LIVING LAB **SME** **Figure 19**
Final thoughts and the future



CHAPTER 4

CONCLUSION

This short chapter
holds and conclusions from
the evaluation



Matching & contracting

Overall, there has been a high level of satisfaction with the Matching & Contracting phase across SMEs and Living Labs.

The time consumption in the matching and contracting phase exceeded most of the Living Labs expectations. This is an issue for Living Labs, and can possibly have significant implications on how Living Labs should construct their initial collaboration processes and how they estimate costs of collaborating with SMEs. One of the primary causes for excessive time consumption in this phase relates to difficulties in finding a SME and finalizing a contract. This finding is especially interesting in the context of this project, where the tests have been paid, and extensive communication efforts have been performed. This entails that Living Labs have to rethink their business models, which in many circumstances build on paid services from companies, and likewise have to rethink how they attract and collaborate with SMEs. Initiatives such as defining a clear value proposition and working with an external network or as testing partner in an existing network or organisational structure may be beneficial to Living Labs.

Many Living Labs considered the high time consumption as being caused a lengthy matching and contracting process. This, however, is contradictory to SMEs perception, who did not express this view, and in some cases addressed a need for more time in this phase. Living Labs therefore may have to reconsider a view of a long contracting period as negative, and see it as part of the value for the SME. In that sense, it is relevant for Living Labs to adjust their perception of the initial matching and contracting phase into one, which matches the documented SME-view of viewing the matching and contracting phase as something, which is value creating, and not a necessary phase before value can be created.

Evaluation of work carried out

Overall, there was a very high correlation between expectations to the work and the quality found in the work after the conclusion of the test. Additionally, across the 14 pairs, both parties are positive towards repeating the process, but with SMEs being slightly less enthusiastic than the Living Labs. When analysing the specific relationship between expectations and quality found, it becomes clear that both the Living Labs and SMEs receive the quality they expected, and that expectations were generally high.

As highlighted, some Living Labs found difficulties in recruiting external test persons for their tests. This negatively influenced the relevant phase for the Living Labs

and continued to be a cause for frustration in the tests in which external parties were relevant. When evaluating the responses concerning the satisfaction with physical tests or workshops, it is clear that the SMEs did not recognise this as an issue and thus not something, which influenced their satisfaction. As co-creation and real life evaluation with real users is a central core of most Living Lab services, securing a local, stable, and accessible panel of users could be a prudent solution to this issue. This however requires a large reach or database of potential candidates for testing. It is worth mentioning, that the Living Labs overall were more critical regarding the amount of participants than the SMEs.

The TRL level found across all 14 tests range from 2-9 before testing and 1-9 after testing and the mean TRL level has seen an increase of approximately one point across all 14 tests. While this somewhat positive result indicates that there has been a positive increase to the market-readiness of the included products, it is worth noting that prior to testing only 4 in 14 pairs rated the product or service at the same TRL level, and that this decreased to 2 in 14 after the test. Overall, the project has thus such a wide distribution of TRL assessments and can document that, in general, the SMEs rate consistently higher than the Living Labs.

Future perspectives

Overall, the data concerning Future perspectives provide a very positive outlook for Living Labs. With the high degree of SMEs willing to repeat the process, contract the same Living Lab again, and seek out other Living Labs, it could be posed that, once a SME has tried and experienced Living Lab services, even in a relatively small scale, they are likely to seek out similar services again. This should provide optimism for Living Labs and inform the design of future services and frameworks supporting open innovation settings such as Living Labs.



Pentel
Color Pen
3500 FINE POINT

Long for
Klusteren
(conclipten)
und pro.

LEBENS
MENSCHEN
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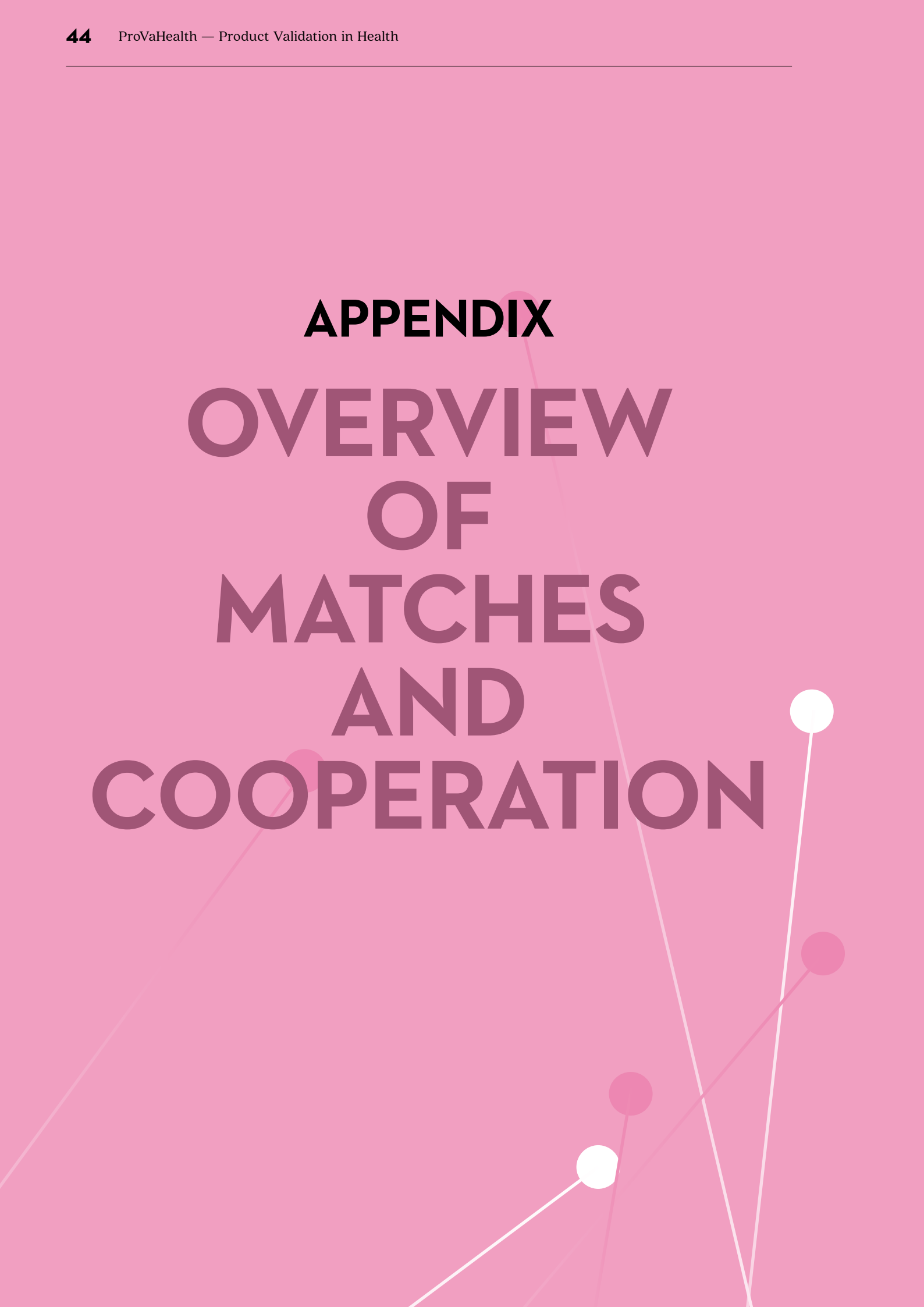
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APPENDIX

**OVERVIEW
OF
MATCHES
AND
COOPERATION**

An abstract graphic consisting of several thin white lines connecting various circular nodes. The nodes are in shades of pink and white, scattered across the page, primarily on the right side and bottom. The lines create a network-like structure.

On the following pages, the 14 matches are outlined with a description of the collaboration, the product or service for validation, as well as an overview of services provided. In addition to this, each match holds both the Living Lab and SMEs own descriptions of themselves.

Together the 14 matches represent a diverse background with companies working with as varied products as functional foods, various and varied telehealth solutions, augmented reality for simulation training for emergency personnel, compliance assistance for medical device developers and more.

MATCH 1

SME

Custom 3D Tech Ltd (Wide)

LIVING
LAB

Haapsalu Neurological Rehabilitation Centre (HNRC)

The collaboration

The objective of the test was to compare 3D printed orthoses with regular ones, mainly in appearance, suitability, and functionality. The whole production process (from getting inputs for production to issuing the orthoses to the patient) will also be tested; the aim is to complete the whole process within 12 days from the moment the patient steps into the hospital.

Product or service for validation

During the testing process, HNRC collect information by scanning the patient's leg or made a plaster cast, and pass the information onto the manufacturer (Custom 3D Tech), who created a 3D model based on the scans and measurements. The plastic part of the finished orthosis reaches the HNRC during the second week of the inpatient treatment cycle. The orthosis expert at the HNRC Assistive Center and the Pediatric Department's physiotherapist evaluated the orthosis' suitability for the patient and adjusted the orthosis in terms of assembling hinges, softening pads, layers inside and fastenings straps.

Services provided / work done

HNRC and Custom 3D Tech Ltd (Wide) have performed 20 tests on patients who require a dynamical or a static ankle foot orthoses (DAFO/AFO), or an orthoses for night usage (AFO-s). Feedback was collected after each test, during approximately 4 months. The patients evaluated the suitability of the orthoses in various aspects and compared it to the conventional orthoses.

The SME

Custom 3D Tech Ltd (Wide)

Custom 3D Tech — WiDE is pioneering functional 3D printed orthotics for O&P clinicians. Custom 3D Tech — WiDE have network of digital orthotists, engineers and 3D printers and do 3D print piece of art orthotic devices and help O&P clinics to uptake digital tools in their practice.

Every specialist can use the tool, even without experience in digital modelling. The provided software allows for automatic and individual customization, based on a person's 3D scan. Combining pre-defined digital design of P&O and the 3D scan, the software generates individual digital model which is then manufactured using additive manufacturing such as 3D printing.

WiDE core activities in the project is the development of 3D printable custom ankle foot orthoses based of 3D scan and improving their usability.

To learn more about the SME visit their website at: www.wide.tech



The Living Lab

Haapsalu Neurological Rehabilitation Centre

HNRC is a hospital that focuses on providing rehabilitation services for children and adults with neurological disorders. Most of the hospital's patients are people with spinal cord and brain injuries, but we also treat patients with progressive nervous system diseases, multiple traumas and congenital developmental disabilities. In our hospital we are treating around 4000 cases a year. At HNRC we also have the HNRC Adaptive Device Centre with 3 orthosis specialists. We produce 400-500 different types of individual orthoses and outsoles a year.

The main providing services of HNRC Living Lab are

- To test medical equipment or orthosis at large amount of patients with different diagnoses and different stage of diseases.
- To provide consultations in medical equipment development, also therapy- and testing methodics development for medical equipment.

The main goal of HNRC is to provide high quality, evidence-based, client-centred and comprehensive services. In addition to its everyday hospital work, HNRC also serves as a practical training base for young specialists and is a reliable partner in various research and development projects.

The quality of Living Labservice we can provide in high level because, we have

- Knowhow and long-term experiences in neurological diseases treatment and in usage top- level equipment.
- Patients with wide range of different diagnosis. Intensive patients flow.
- Experiences in scientific work at different projects.
- Top technological basis.

In the ProVaHealth project, Haapsalu Neurological Rehabilitation Centre has acted as a Living Lab and contributed to all activities in the project. To learn more about the Living Lab visit their website at: www.hnrk.ee

MATCH 2

SoftComply OÜ

The North Denmark Region – Aalborg University Hospital



A diagram consisting of two circles connected by a thin line. The top circle is dark purple and contains the text 'SME'. The bottom circle is light pink and contains the text 'LIVING LAB'.

The collaboration

SoftComply has developed a new software system for risk management of medical equipment. The purpose of the test was to test in practical terms if the software performed and secondly to give feedback to the developer on possible improvement.

Product or service for validation

The product is a software for risk assessment and management for medical equipment. This software would potentially be of great help for medical device companies, working within the new EU Medical Device Regulation.

Services provided / work done

At the test site, the software was looked through in details and checked against the relevant standards and procedures in the field. Additionally, the software was used in a practical test to assess functionality and results. The overall feedback was positive, and some concrete suggestions for improvements were made based on the test.

The SME

SoftComply OÜ

SoftComply Risk Manager is an app for Jira to manage, trace and report medical device risks. SoftComply Risk Manager has been developed for medical device companies and is based on the ISO14971. SoftComply Risk Manager is fully integrated to Jira, is customizable and comes with a compliant Hazard Analysis template. It supports visualization of risks in Initial and Residual Risk Matri-

ces and includes automated Risk Management Plan and Risk. SoftComply apps speed up the regulatory compliance for CE marking and FDA approval through automating the implementation of QMS and the device risk management.

We help medical device software companies get their innovative products to market faster by offering Atlasian apps for regulatory compliance.

To learn more about the SME visit their website at: www.softcomply.com

The Living Lab

Ideklinikken — Aalborg University Hospital — The North Denmark Region

The North Denmark region is one of five regions in Denmark. The North Denmark Region is responsible for three main tasks, health care, regional development, social services and special education. Aalborg University Hospital is the largest hospital in the North Denmark Region. It is also northern Jutland's largest employer, with approximately 6,500 employees.

Ideklinikken is the Health Innovation Hub for hospital innovation at the North Denmark Region. It was founded in 2009, focussing on user-driven innovation. Over time, Ideklinikken has been merged with the Region's patenting and TTO activities as well as Living Lab activities, to form a strong unit that deals with all interfaces between industry and clinic/research at the hospital. Currently, Ideklinikken is the only hospital based TTO in Denmark, dealing with the specialized understanding and different timelines and validation processes that signify the commercialization of health care products.

These competences makes Ideklinikken an ideal Living Lab in terms of health care, as most competences can be found within the regional innovation hub, including

- Commercialization experience, including IPR protection
- Experiences with on co-collaboration processes
- Fundraising
- Service & industrial design
- Clinical Trials — Pharma & medtech
- A large network within the Regional hospitals
- Project management

Ideklinikken is used to working with industry, large companies as well as SMEs, and can quickly help set up anything from a quick validation of need to a PoC process and full scale valuation in a clinical trial.

Ideklinikken is also employing the regional coordinator of the Trial Nation network, which is a national initiative for the promoting and sharing of clinical trials on pharma and medtech, along with hosting and coordinating a number of regional, national and EU projects.

In the ProVaHealth project, Ideklinikken — Aalborg University Hospital — The North Denmark Region has acted as a Living Lab and contributed to all activities in the project. To learn more about the Living Lab visit their website at: www.rn.dk

MATCH 3



The collaboration

The purpose of the collaboration was to pilot level test the solution to be considered for larger scale usage in deployment and optimization of Electronic Health Record (EHR) systems. This included assessment of the benefits and considerations as well as ease-of-use and usefulness of the solution from the users' perspective. In addition, GDPR and local data protection requirements needed to be addressed according to the chosen level of logging, anonymization and detail.

Product or service for validation

The following product was tested: UX Capturer – Record User Interaction & Reactions.

Rationale of product: Problems of use in information systems and digital applications often cause compromised quality of service and wasted labour among other resources. Many emergent problems are easy to detect by the users, but difficult to trace back without sufficient recording of user interaction. The UX Capturer makes it possible to record user interaction as it happens at a computer workstation or laptop. User experience and insight achieved through event tagging in connection with real use of the systems.

Functionality: UX Capturer records the user's computer screen, keystrokes and mouse clicks. The user can mark up any moment of interest with a dedicated button interface. Audio recording is optional and keystrokes can be masked out for password confidentiality. The video recording is stored as a movie recording as short consecutive clips with predefined length (typical default is 50 sec.). Keystrokes, mouse clicks and user markups are composed as a subtitle file for each video clip. The video files along the subtitle files are directly viewable with a compatible video player such as VLC player. Further analysis can be done with UX Reporter locally or at ux2play.com service in the cloud.

Services provided / work done

1. Preparatory work: Determining the outcome of the test required by the company Adusso whose product was tested. This was followed by design of the test process,
2. Discussion on and formulation of Non Disclosure Agreement (NDA) as well as a Data Processor Agreement to comply with the GDPR considering that patient data would be accessed during the test.
3. The unit Active Patient Support (APS) was selected to make up the Living Lab for the test in question based on test design.
4. Kick-off meeting to brief APS staff using EHR system subject to the test on the nature of the test, viz. what the test programme performs, what the test persons among the staff can or has the opportunity to do, and to clarify questions.
5. Installation of the application (computer software) on workstations at the premises used by APS staff.
6. Actual testing of the EHR system used by APS staff by way of the programme Adusso_UX_monitoring. Was carried out in six days over two consecutive weeks. Five different staff members participated in assessing ease-of-use and usefulness of the programme from a user's perspective. Furthermore, IT staff members assessed ease of installing the test software,
7. Wrap-up workshop to present and discuss test results and how they can be used by Adusso, the test organisation APS (the Living Lab) and Region Zealand in general.

The SME Adusso Ltd.

Adusso is a Finnish company, which provides cloud-backed solution to improve the operations and systems at healthcare facilities by improving the usability of their digital systems. The mission of Adusso is to save the healthcare industry from badly working computer systems, allowing the healthcare professionals to focus on the necessary.

The UX product called UX2play/ Uicapture collects information about computer usage in real context-of-use. The device captures everything, which is shown on screen, along with mouse clicks and keystrokes. In addition to this, the user can leave a comment via either

speech or writing to explain an emergent observation. There is a feedback functionality for tagging any good or bad user experiences. These tags are time stamped to allow subsequent detailed analysis as the videos can be examined by concentrating only on what takes place just before a tag and immediately after. The analysis includes coding and classifying the events with different criteria, for instance based on severity and cumulative existence of an identified problem or suggestion for improvement. The feedback data are thus used to identify and fix issues with the operations and systems, making the work at hospitals and medical clinics more efficient.

To learn more about the SME visit their website at: www.adusso.com

The Living Lab Health Innovation Zealand

Region Zealand is one of the five administrative regions in Denmark. The region provides healthcare services for 821,000 citizens. The main task of the region is to run and develop its six regional hospitals as well as its mental health services and social institutions. The region has more than 17,000 employees.

Region Zealand provides Living Lab services to private partners through different facilities. The main facility is One Point of Entry (OPE) for Medical Devices. This is the entrance for companies to Region Zealand with regard to developing and/or testing new product and service solutions. OPE facilitates contact to the relevant departments in the region. OPE also welcomes ideas for new solutions from healthcare professionals in the region. One Point of Entry (OPE) is run by the department Data and Development Support in Region Zealand.

One Point of Entry (OPE) for Medical Devices offers the following services

- Initial screening of product and service to determine the potential value of cooperation to the customers and to the region itself,
- Custom-made assistance to establish and facilitate collaborative innovation projects between the customer (company) and the region,
- Establishment of match between company and one or more departments within the region's hospitals and centres,
- Sparring on ideas for products and services before innovation process starts in earnest
- Co-creation of products and services. Examples: apps, eHealth and mHealth related products and services, certain work processes, software – e.g. for planning of manning of service delivery processes, etc.),
- Planning and carrying out of test of products and services,

- Provision of persons for test of products and services: healthcare staff, patients, citizens – and administrative staff;
- Validation of test results according to international protocols for innovation and research,
- Active use of the region's health data to support development of products and services
- Advice on public procurement related to products and services,
- Information on market aspects (to a relatively limited extent),
- Advice and assistance in implementing innovative projects between private and public partners.

The goal of OPE is for companies to become stronger in the market after participating in a process of developing a new product or service and/or testing a new solution.

In the ProVaHealth project, Health Innovation Zealand has acted as a Living Lab and contributed to all activities in the project. To learn more about the Living Lab visit the website at: <https://www.regionsjaelland.dk/Kampagner/Medicinsk-udstyr/Sider/Om-medicinsk-udstyr.aspx>

MATCH 4

Cognuse

CoLab Plug and Play

SME

LIVING LAB

The collaboration

The purpose of the test was to evaluate the use of an audio guide, CoNurse, with guidelines for the most common procedures, in a Danish hospital setting. The test took place in CoLab Plug & Play, a test environment that provides facilities on commercial terms, combined with technological service and guidance.

Product or service for validation

CoNurse by Cognuse is an audio solution designed for nurses. It is a voice-guided tool for improving the quality of the procedures, and reducing medical errors and unforeseen incidents. This tool is to be integrated into the clinical workflow to help ensure procedural protocols, guidelines and checklists are followed every time, and it helps the nurse to remember over 300+ protocols.

Services provided / work done

Two nurses from the acute unit at the Hospital of Southern Jutland were testing CoNurse one person at a time. Normally the nurses do not use audio guides; instead, they carry a booklet in their pockets, which includes guidelines for the most common procedures. The tested scenario was Glasgow Coma scale. By instructions from the representatives from Cognuse, the nurses followed the guide on a tablet, and performed the procedures on a mannequin. After the test, the nurses shared their experiences with CoNurse.



The SME

Cognuse

Cognuse is a digital health company from Estonia, who are building IT-solutions for healthcare professionals and patients. Cognuse are focusing on improving the guidelines adherence to improve care quality, outcomes, and to reduce complications. Cognuse believes that the complex system of healthcare, which is prone to human error, can be positively changed with digital technologies.

Cognuse is working together with hospitals and healthcare professionals to build scalable solutions and provide real-time support while working for the clinical staff and for the patients during the recovery process.

To learn more about the SME visit their website at: www.cognuse.com

The Living Lab

CoLab Plug and Play, Region of Southern Denmark (Health Innovation Centre of Southern Denmark)

Health Innovation Centre of Southern Denmark (HIC) is the first regional staff unit for health and welfare innovation in Denmark. HIC functions as an innovation consultancy for all departments in the Region of Southern Denmark and for other partners, such as municipalities and private companies from around the world. HIC supports the innovation process from idea to implementation within the areas of healthcare technology, telemedicine, optimized operation, and future-proof construction.

The vision of HIC is to be the promoter for the development of the collaboration between the healthcare system and private companies.

We do that by offering private companies and public organisations the following services and products

- Facilitation, project management, and consultancy of development projects between public and private partners.
- Test runs, user surveys and identification of needs in relation to usability, service design, technical requirements, and product- and organisational development.
- Workshop facilitation, co-creation setups between end-users and manufacturers, and the possibility to test work procedures in a 1:1 ratio mockup construction.
- Impact Assessment and documentation of new solutions, such as business cases in relation to public operation and certification based on testing in public operation environments.

- Facilitation of digitised collaboration agreements between sectors that will help to improve the continuity of care, and facilitation of aggregated data sharing that will improve the possibility for cross-sectoral data analyses.
- Development and implementation of infrastructure and standards for data sharing and user involvement.
- Coordination and implementation of MedCom standards, and consultancy on digital platforms in the healthcare system.
- Preparation of applications to public and private funds.

In the ProVaHealth project, CoLab Plug and Play has acted as a Living Lab, led group of activities 4.2 titled *Pilot testing* and contributed to all other activities in the project. To learn more about the Living Lab visit their website at: www.innosouth.dk.



Videopresentation of the living lab CoLab, hosted at the Health Innovation Centre Of Southern Denmark

MATCH 5

Yolife

SME

South-Eastern Finland University of Applied Sciences (Xamk)

LIVING
LAB

The collaboration

The objective of the test was to gain end-user insight and experiences about the Yolife app during a 2-week usage. The collected data is used for further development of the app and for other possible business development and marketing purposes.

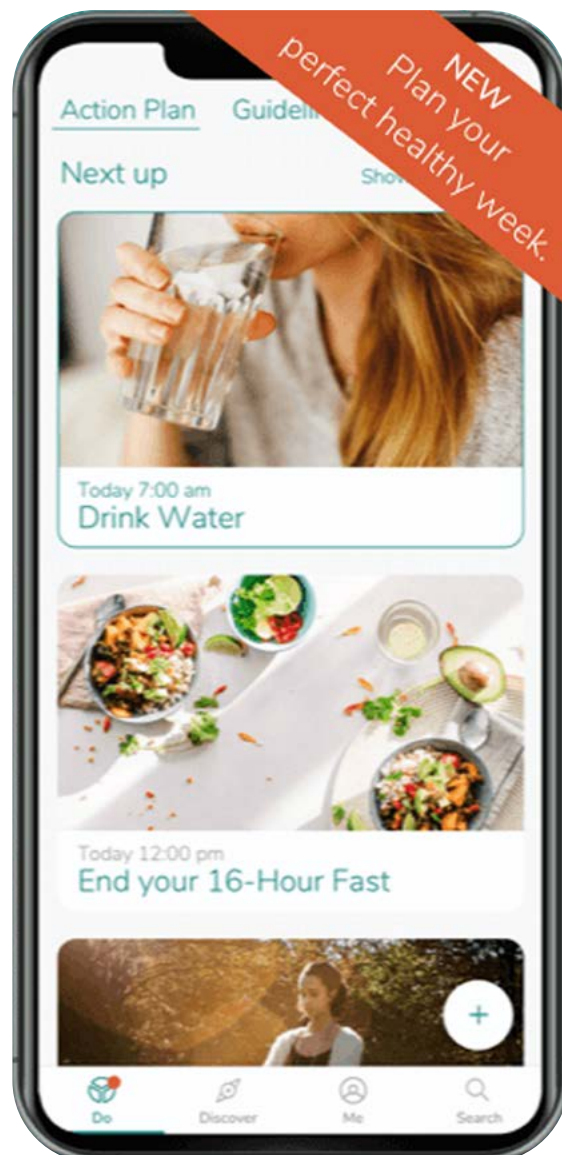
Product or service for validation

Yolife mobile app is your personal coach to live longer in good health, and avoid age- and lifestyle related diseases. The app knows you as a whole person, it helps you make the lifestyle and habit changes that are relevant for you – All backed up by the latest science.

Services provided / work done

The test protocol and the research questionnaires were designed by Active Life Lab. The protocol was reviewed and approved by Yolife. The app was tested by real end-users in Mikkeli region in Finland. The data was collected by online questionnaires.

The target group for the test was selected from the Active Life Lab testing register. The register consists of 232 end-users who have participated in previous Active Life Lab research or interventions. The registered end-users are from a variety of demographic groups including e.g. people from students to elderly.



The SME YoLife

Yolife GmbH is a German start-up company, which develops a mobile app that helps people to live longer in good health and avoid age-related diseases. Yolife mobile app is a personal subscription to a longer life in good health. The app applies the findings of 300+ scientific research papers to 15+ areas of your life, designed to make improving your health easy and effective.

Yolife offers personalized content and tips based on your specific areas of improvement: nutrition, exercise, sleep, stress, social life, and many more. The platform offers hints on how your sleep affects your food cravings, how social life affects stress levels. Score with healthy lifetime or learn some irony and self-forgiveness in case you did not behave so healthy. Yolife's health suggestions are backed by scientific studies.

To learn more about the SME visit their website at: www.yolife.io

The Living Lab The South-Eastern Finland University of Applied Sciences (XAMK)

The South-Eastern Finland University of Applied Sciences (Xamk) is an innovative higher education institution driven by the idea of unlimited lifelong learning and study. The passion to learn is not bound to time, place or method — it is a way of looking at the world.

We promote well-being and sustainable development through global networking and by creating new digital solutions. One of the goals is to be the largest Finnish university of applied sciences in terms of ROI activities and education provided through the Open University of Applied Sciences.

Active Life Lab is a research and development unit of the South-Eastern Finland University of Applied Sciences, which works in the premises of Saimaa Stadium, established in 2018 in Mikkeli.

Our mission is to increase people's health through effective wellbeing services. We carry out our mission by systematically gathering information on the effectiveness of wellbeing services, conducting cutting-edge research to develop services, and applying this knowledge in practice with our partners. Research and development projects form the foundation of our activities. Besides, Active Life Lab offers expert services in cooperation with partners and serves as a learning environment for Xamk students.

The facilities of Active Life Lab offer possibilities to measure the effectiveness of activities targeted to improve human wellbeing. The information provided by the variety of indicators can be used to find out how the effectiveness of the activities varies in different customer groups. The information can be used for target activities for the customers, who will get the most benefits from them. The information collected will help compa-

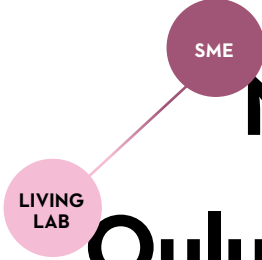
nies develop new solutions that have a measured impact on human wellbeing.

In the ProVaHealth project, The South-Eastern Finland University of Applied Sciences has acted as a Living Lab and contributed to all activities in the project. To learn more about the Living Lab visit their website at: www.xamk.fi



*Videopresentation
of the XAMK Active
Living Lab*

MATCH 6



Neutron Star Tech Oulu University of Applied Sciences

The collaboration

The objective of the test was to test the usability of the IT-solution Medda which saves time on documentation and paperwork.

Services provided / work done

The company sent material and prototype of the product. The Living Lab organized an expert panel to test the prototype, the panel consisted of health- and social professionals and lecturers. The first step was that the panel members got familiar to the product. Secondly, the panel focused together on the IT-solutions usability and relevance. After the test the feedback and a list of advice and improvements was gathered in a report.

Product or service for validation

Medda is an IT-platform for social workers that simplifies their work, reduces bureaucracy, and improves communication with general practitioners. There are problems of information exchange between social workers and general practitioners. Another issue is that local governments, special care institutions, and general care homes are documenting on paper, in Word and in Excel. Outdated programs and duplication of work increase the time spent on documentation. The purpose of this IT-solution is to save time on documentation and paperwork, and release more time to spent with the clients. Furthermore, the purpose is also to simplify and speed up the communication between the social worker and the general practitioner.

The SME

Neutron Star Tech

Medda is an IT-platform by Neutron Star Tech, it simplifies and speeds up the communication with the general practitioners. The goal is to save employees time with documentation. In Medda the social workers can plan their work and meetings, and they can insert clients and change information about them. They can also insert a health form and send it to a general practitioner. Medda is working with Põlva Local Government social department, as well as MTÜ Singel Kodu (Special Care System) and youth general practitioners in Estonia.

To learn more about the SME visit their website at: www.neutronstar.eu

The Living Lab

Oulu University of Applied Sciences (Oulu UAS)

Oulu UAS is a strong and multidisciplinary University of Applied Sciences which educate competent and innovative professionals and do active research and development. The cornerstones of the strategic operations of Oamk are its competent personnel, talented students, the innovation cluster in Oulu, and the network of higher education institutions and research institutes in Northern Finland.

Oamk SimLab consists of versatile simulation environments and lab environments of different professional health care areas which are used by companies and stakeholders for product development of health technology and welfare services. In addition, Oamk SimLab offer versatile possibilities for testing and developing products and services and training the staff.

It is possible to utilize both students' from different study programs and teachers' feedback during testing and development processes. Oamk SimLab provides safe environments for solution testing and validating before the certification. No ethical requirements are needed.

Ouas SimLab is a partner in OuluHealth ecosystem and OuluHealth Labs

OuluHealth is one of the five innovation ecosystems of Oulu Innovation Alliance. The OuluHealth ecosystem comprises several stakeholders from academia, the public sector, and the private sector. The principal idea is to facilitate open collaboration and to accelerate innovation by bringing together various partners able to contribute to the needs of the health care sector. OuluHealth Labs provides a unique, integrated health test and development environment for companies, including feedback from professionals, for every phase of the R&D process.

In the ProVaHealth project, Oulu University of Applied Sciences has acted as a Living Lab, led group of activities 2.2 titled *Development of self-assessment toolbox* and contributed to all other activities in the project. To learn more about the Living Lab visit their website at: www.oamk.fi

MATCH 7

Herosight

Seinäjäki University of Applied Sciences (SeAMK)



SME

A diagram consisting of two circles connected by a thin line. The top circle is dark purple and contains the text 'SME'. The bottom circle is light pink and contains the text 'LIVING LAB'. The line connects the bottom of the 'SME' circle to the top of the 'LIVING LAB' circle.

LIVING
LAB

The collaboration

SeAMK organized a questionnaire for a class of nurse students and for the teachers of acute care studies.

Product or service for validation

Augmented Reality software for decision training in stressful situations that will optimize basic education and simulation training for emergency personnel. The company was interested in getting feedback on how the simulation training/situations were carried out and hopes for the future training.

Services provided / work done

Our project team formulated a questionnaire together with the company representative. The questionnaire were distributed for one student group and a couple of teachers teaching acute care. The answers were recorded to google drive from where the company could see the results.

The SME Herosight

With the use of Augmented Reality as a cutting-edge technology, HeroSight builds a solution with medical experts and co-creating customers that will optimize basic education and simulation training for emergency personnel. By developing AR-software for decision training in stressful situations, HeroSight enhances the realism of simulations whilst lowering costs and resources.

HeroSights AR software simplifies practical training of emergency situations. With the use of AR glasses, HeroSight augments any training location in real time providing a more realistic scenario with 360° audio design & 3D models based on authentic medical data. This removes the need for actors and simultaneously provides a better foundation for training adequate decision-making. A built-in feedback system unburdens instructors by providing instant feedback for learners and real time follow-up statistics for management.

To learn more about the SME visit their website at: www.herosight.se

The Living Lab Seinäjoki University of Applied Sciences (SeAMK)

Seinäjoki University of Applied Sciences is a multidisciplinary institution of higher education and an efficient actor in education and research, development and innovation (RDI) in the region of South Ostrobothnia in West Finland. SeAMK conducts research, development, and innovation (RDI) with a distinctly practical emphasis, serving teaching and supporting industrial small and medium enterprises (SME) and service production within the region. RDI is carried out in cooperation with regional and national enterprises and organizations.

One of the SeAMK's focus points is health and well-being technology and SeAMK is investing in it. SeAMK Telemedicine Centre is a home-like environment where you can explore different kinds of assisted living technologies and eHealth products provided by various companies. The centre provides information about the assisted living solutions for example to elderly people and caretakers as well as to social and health care professionals and students. SeAMK is working close with The Hospital District of South Ostrobothnia, this gives possibilities to use their professional support from the different fields.

We have introduced telemedicine solutions such as distance consultation devices to the health care professionals of Finnish municipality's public health authorities. We offer consultation services and can arrange groups of professionals and end users for testing and piloting purposes.

In the ProVaHealth project, Seinäjoki University of Applied Sciences has acted as a Living Lab and contributed to all activities in the project. To learn more about the Living Lab visit their website at: www.seamk.fi

MATCH 8



SDS Optic

Laurea University of Applied Sciences



The collaboration

The objective of the walk-through setting was to introduce a novel platform for breast cancer diagnostics to a Finnish expert of the breast cancer diagnostics with significant experience.

Product or service for validation

SDS Optic 's product inPROBE is a disruptive platform technology with global potential to challenge the paradigm of targeted biology diagnostics and real-time targeted drugs delivery monitoring. It is a minimally invasive medical device that is capable of real-time diagnostics of HER2 breast cancer biomarkers.

Services provided / work done

The inProbe device is in a phase where the in vitro testing has been completed. In a short while, the company is ready to start in vivo testing with real breast cancer patients. The aim of this meeting was to introduce the inProbe device to a Finnish MD, radiologist, who has a wide experience on breast cancer diagnostics on daily bases. SDC Optics was willing to hear the Finnish expert's opinions of the devices and its solution. The company wants to build and to develop their product to meet the expert's experiences. Also, for the company, it was important to hear about the Finnish market situation and the possibilities to enter the breast cancer diagnostics market in Finland. As the diagnostics procedures varies a lot from country to country, the SME gained valuable information of the breast cancer diagnostics in Finland.

Laurea university of applied science' role was to enable the meeting between the SME and a Finnish expert. Discussions with the SME participants after the meeting confirmed that this walk-through meeting fulfilled their expectations and they were very satisfied with the meeting.

The SME SDS Optic

SDS Optic develops and creates innovative solutions on the borderline of biochemistry, engineering, and fibre optic technologies that can be used in cancer diagnosis and treatment.

The SDS Optic team is working on a breakthrough technology based on rapid detection of test substances in the body, including cancer markers using laser beams and innovative components. At the end of the process,

the reading is interpreted on the detector by means of an appropriate conversion algorithm, which gives the level of the compound tested (e.g. HER2 cancer marker) in numerical form.

SDS Optic created inPROBE, a tool for direct measurement of the HER2 marker. The use of a microsonde will save the patient pain and stress associated with a biopsy and waiting for the result. We want to save up to 30% of people diagnosed with cancer by 2030

To learn more about the SME visit their website at: www.sdsoptic.pl/en/main-en

The Living Lab Laurea University of Applied Sciences

The strategic intent of Laurea University of Applied Sciences is to be an international developer of working life competence and vitality in the Uusimaa region in 2030. The needs recognized as a base for this choice among others are: Expanding and deepening the strategic regional, national and international partner network and increasing the impact of R&D activities and boosting competitive funding. Strategic choices supporting these needs are for example building impact through the integration of teaching and RDI activities – by gathering vertical research data in degree-awarding education and by applying it in RDI activities, applying service design methods and co-creation in all operations. Values guiding all our operations are openness, effectiveness and responsibility. Renewing social services and health care sector, as well as digitalising and technologising society being our two of our areas of expertise, they also are the backbone of our Living Lab operations.

Our three main tasks are: education, R&D and regional development. Laurea Living Labs Network serves the integration of the three tasks in the optimal way. Laurea Living Labs Network collaborate with research institutions, companies, public agencies, citizens, and users for investigating and creating new products and services. Living Labs enable facing economic and social challenges with novel technological opportunities and professional practices and speed up competitive business and value creation models for the national and global markets.

Our strength in the early phases of innovation process are ideation, conceptualization with content specifications and business model. Tools used in this work are service design, co-creation and –innovation. They should add customer insight in service or product development before next development steps, testing and

validation before last stages of market entry. Therefore, end-users and clients are involved in this process.

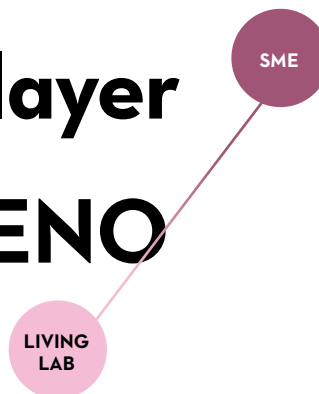
Laurea is strengthening its role as an intermediary at the regional, national and international levels by developing networks and culture of innovation, and sharing platforms, methodologies and evidence-based knowledge. Laurea has been an active member of the European Network of Living Labs (ENoLL) since its establishment in 2006.

In the ProVaHealth project, Laurea University of Applied Sciences has acted as a Living Lab, led group of activities 2.1 titled *Conceptualization of Living Labs* and 3.1 titled *Living Lab improvement process* and contributed to all other activities in the project. To learn more about the Living Lab visit their website at: www.laurea.fi

MATCH 9

ArtPlayer

WITENO



The collaboration

The objective of the collaboration was the evaluation of the ArtPlayer technology for an application scenario. By an integration of the ArtPlayer system into the mobile ILWiA Living Lab, the technology was presented to professional users, representatives from institution (hospital, nursing home, residential property company) and end users (elderly persons). The test phase was planned for 30 days. The cost for the installation, the technical support and the test was covered by the ProVaHealth project. Therefore, the test was free of charge for visitors.

Product or service for validation

ArtPlayer is a TV streaming and digital signage art service that decorates and creates ambience, which makes it ideal for workplaces, hotels, libraries, dentists, hospitals, nursing homes etc. In addition, several research projects have shown a link between artistic influence, relief and recovery. ArtPlayer is used for improving patient surroundings in hospitals as well as housing environment for elderly in nursing homes.

Services provided / work done

The ArtPlayer system was installed in the ILWiA mobile Living Lab which toured to several locations in Mecklenburg-Vorpommern and Denmark to showcase this and other technologies supporting elderly persons living at home. The test started at the inspiration day on 7th of February 2019 (Odense) and was prolonged and performed until September 2019 to give more visitors the chance to evaluate the ArtPlayer system. The majority of visitors were elderly people, but the system was also presented to representatives of housing companies and representatives of care facilities visiting the Living Lab container. The ILWiA team collect the user feedback and delivered it to ArtPlayer to support the adaptation of the

ArtPlayer system for the German market. The idea using the TV to influence the wellbeing and the mood attracted a large interest by the professionals.

The SME ArtPlayer

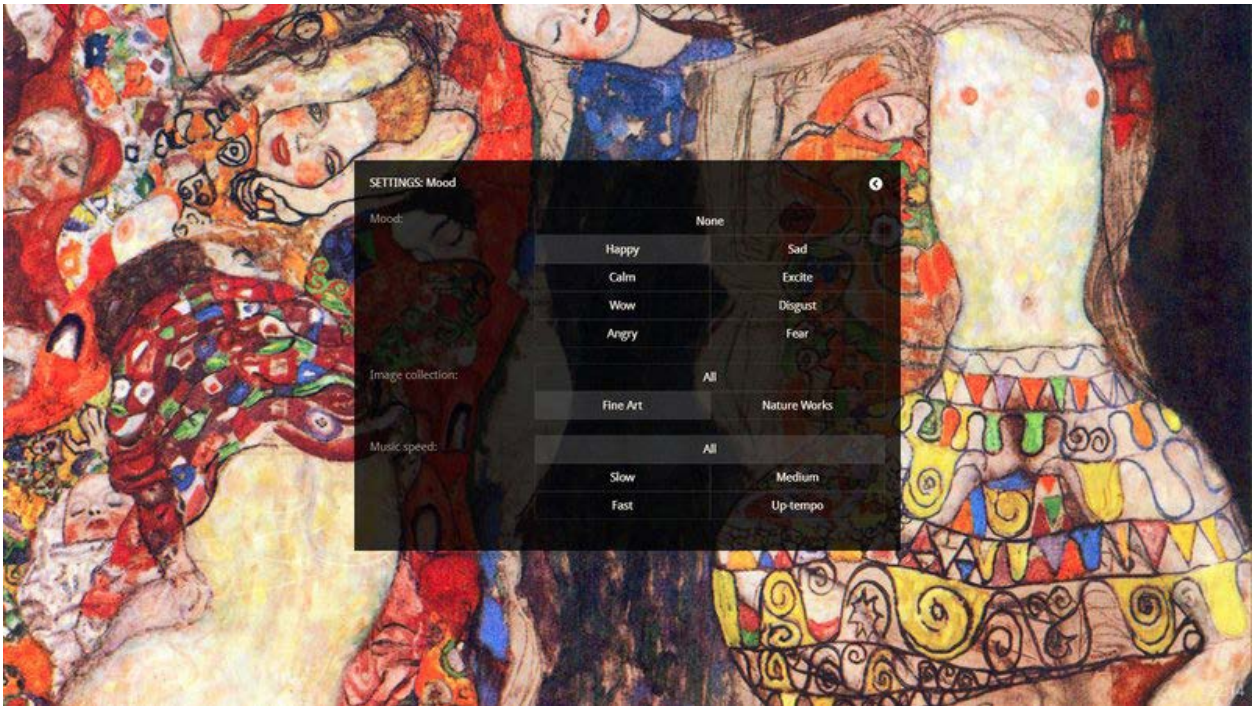
ArtPlayer is a TV streaming and digital signage art service that decorates and creates ambience, which makes it ideal for workplaces, hotels, libraries, dentists, hospitals, nursing homes etc. In addition, several research projects have shown a link between artistic influence, relief and recovery.

ArtPlayer is inspired by Bill Gates who already in the early 1990s displayed art on framed and wall-mounted PC screens at his mansion. ArtPlayer is part of Cume-din ApS, a culture and media company focused on the distribution of TV and digital signage art to airports, hotels, restaurants, libraries, hospitals etc.

ArtPlayer works on PC, tablet or smart TV, but can easily be integrated into your own info screen and digital signage system as a screen feed via web link URL. It displays curated and world famous high resolution art images accompanied by pleasant background music based on your selected settings. Additionally, it allows the user to create his own scrolling ticker messages, thus transforming any screen that is connected to the internet into a dynamic infotainment gallery.

Our vision is to become the leading global provider of TV streaming and digital signage art that can be adjusted according to purpose, style and mood for displaying in public spaces and the future digital home.

To learn more about the SME visit their website at: www.artplayer.com/healthcare.html



The Living Lab WITENO

WITENO has plenty of experience in the setup of innovative, technology oriented and knowledge-based ventures. Their sectoral focus is diverse and cover topics within life science and health economy, in application of plasma technologies, creative industry as well as IT and digitalisation.

Additionally, WITENO offers support of the implementation of innovative ideas. WITENO supports start-ups and young businesses with consulting services, is active in various expert panels and networks and implements projects to the benefit of the region.

In case you are planning to use public funding as incentive for business development, WITENO will assist in the acquisition and has comprehensive experience in implementation of regional, national and international funding projects.

WITENO maintains the Interreg South Baltic contact point open to all enquiries concerning the South Baltic funding schemes.

WITENO strongly support the development and the grow of the regional cluster Initiative Leben und Wohnen im Alter (Association for living and housing in old age: ILWiA e.V. and also runs the Regional InfoPoint on Healthy Ageing (Kommunale Beratungsstelle, municipal consulting office). As a successful incubation ILWiA is now the independent association for all questions about living and housing in old age in the region and were WITENO is one of the founding member. ILWiA has acquired unique knowledge in the field of assistance systems for elderly people living in their own homes. To achieve this goal WITENO also operated a showcase

apartment for the broad public, which is equipped with various technical assistance systems supporting self-determined living and housing in old age and supports the development of the mobile ILWiA Living Lab container.

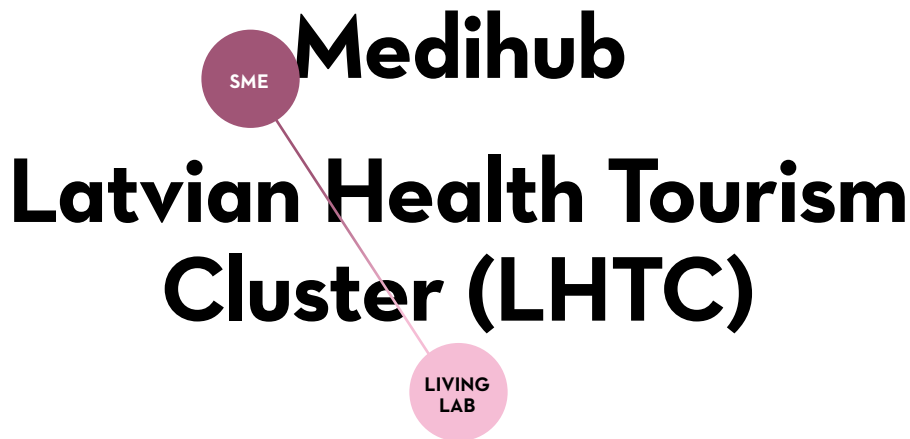
The apartment offered a hands-on experience of technology providing the visitors with different comprehensible use cases. Up-to-date technical assistance systems were presented manufacturer and distributor independent. We managed the apartment in close collaboration with the administrative district Vorpommern-Greifswald and the non-profit ILWiA association

The services, now continued by the ILWiA association, are

- Project management and consulting of projects regionally, nationally and internationally
- Testing, user surveys and identification of needs related to usability, technical requirements, and product and innovation development.
- Evaluation workshops in the LivingLab between end users and manufacturers
- Development of new solutions or requirements, e.g. Approvals for the German healthcare market, Licenses & property rights, interfaces to other system solutions
- Support and consulting marketing and sales
- Funding advice

In the ProVaHealth project, WITENO has acted as a Living Lab, was first leader of group of activities 3.2 titled *Transnational Living Lab training programme and concept development* and contributed to all other activities in the project. To learn more about the Living Lab visit their website at <https://ilwia.de>.

MATCH 10



The collaboration

The objective of the test was to make a Latvian version of Medihub and test it on Latvian users.

Product or service for validation

Medihub is a platform and IT-solution where people can directly compare prices of medical services between different cities and countries and find the best possible treatment for their health issues.

Services provided / work done

LHTC integrated all their clinics and treatments into the Medihub platform, and created a Latvian version of the platform. Patients from Latvia could choose treatments from Latvia, Estonia and Finland. The catalog consisted of categories, subcategories and what is called — stems. A — stem is an idealized description of a particular service that a clinic can offer. The platform was tested by users and they gave feedback on the treatment choices and the platforms usability.

The SME

Medihub

Medihub provides a website where people can directly compare prices of medical services between cities and countries. To learn more about the SME visit their website at: www.medihub.org

The Living Lab

Latvian Health Tourism Cluster

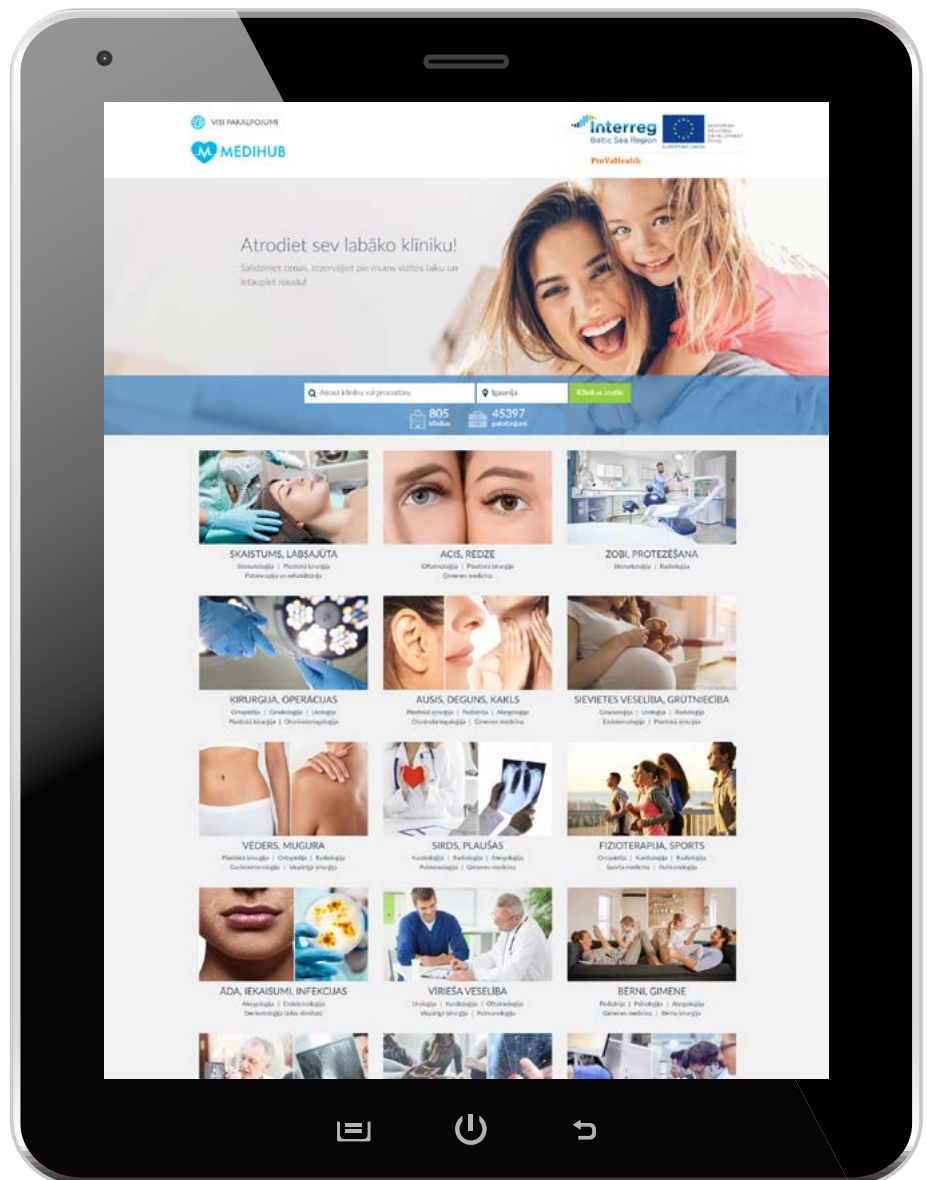
LHTC includes 60 cluster members, wide variety of health tourism providers: Government, municipality and regional hospitals, private clinics, rehabilitation centers, resort hotels, travel agencies, educational and research institutions.

LHTC's main priorities are: development of complex products in the sphere of health and — especially — medical tourism highlighting, for instance: Weight loss surgeries, Dermatology, Diagnostics, Childbirth, Aesthetic medicine, Gastroenterology, Gynaecology and urology, Internal medicine, Cardiology, Fertility treatment, Treatment of oncology diseases, Orthopedic, Otorhinolaryngology, Pediatrics, Plastic surgery, Vision, Rehabilitation, Reconstructive surgery, Vein treatment, SPA, Dentistry and others.

The cluster gives an opportunity to improve cooperation among health tourism providers, to organize common marketing activities, to invent and market integrated, innovative tourism products and services, and to make them more available to locals as well as foreign tourists.

Main areas of the cluster activities

- To implement marketing activities of the health tourism industry, which would provide a significant increase of the export services (development of the website www.healthtravellatvia.lv).
- To facilitate collaboration of the cluster partners in service providing.
- To collaborate with state institutions: Ministry of health of the Republic of Latvia, Ministry of Foreign Affairs of the Republic of Latvia, Ministry of Economics, Latvian Investment and development Agency, Central Finance and Contracting Agency and others.



- To promote collaboration of the cluster operators and universities in order to ensure the compliance with the human resources requirements for the health industry.
- To develop cooperation links in research and development between the cluster members and scientific institutions in order to create new and innovative added value products and services, based on the unique Latvian nature capital.
- To represent the interests of the health tourism industry in drawing up the policy and development documents.
- To increase the the cluster capacity and to promote the international cooperation.

In the ProVaHealth project, Latvian Health Tourism Cluster has acted as a Living Lab and contributed to all activities in the project. To learn more about the Living Lab visit their website at: www.healthtravellatvia.lv/en

MATCH 11

Experimentica

Vilnius University



The collaboration

New drug substances with anti-inflammatory effect testing in vivo using laboratory rats.

Product or service for validation

Product or service for validation
Novel drug materials are under development, therefore all related information is strictly confidential.

Services provided / work done

The Living Lab provided a service dedicated to testing of anti-inflammatory activity of new drug substances. The inflammatory process and arthritis were induced in laboratory rats of Wistar strain by using Complete Freund's Adjuvant containing Mycobacterium tuberculosis (*M. tuberculosis*). Test materials were injected subcutaneously every day, in up to 6 weeks.

The SME Experimentica

Experimentica Ltd. is a contract research organization (ophthalmic CRO) dedicated to developing and offering novel preclinical ocular models and services to clients in the pharmaceutical, biotech and academic sectors. Experimentica offers the preclinical development pipeline with an industry leading portfolio of in vitro, ex vivo and in vivo models. The concept of Experimentica Ltd. is to bridge a gap between the development of novel in vitro, ex vivo and in vivo ocular models and their use in developing clinical applications as well as to draw upon academic knowledge in a contract based organization.

To learn more about the SME visit their website at: <https://experimentica.com>

The Living Lab Vilnius University

Vilnius University (VU) is the largest Lithuanian education and scientific institution. Research in Life and Health Sciences at VU is carried out in the Centre of Life Sciences.

VU Centre of Life Sciences consists of three institutes: Institute of Biochemistry, Institute of Biosciences, Institute of Biotechnology. The mission of Centre of Life Sciences is to serve as a hub for creating and fostering life sciences ecosystem at Vilnius University and Lithuania by offering internationally competitive research and study programs to nurture a new generation of researchers and innovators competitive in a global world.

VU's strategic priorities are

- Becoming an integral part of European Life Sciences community: conduct research and develop study programs competitive at the international level.
- Enhance Lithuania's potential in Life Sciences: contribute to the creation of the life sciences ecosystem.
- Motivate Life Sciences Center community: improve research and study environment.

Research focus in the Centre of Life Sciences

- Gene editing technologies, like CRISPR Cas;
- Nucleic acid and protein technologies, molecular diagnostics;
- Drug design;
- Droplet microfluidics technology;
- Next generation epigenomics;
- Biocatalyzers;
- Lipid systems and membrane proteins;
- Brain studies, like recording and analysis of physiological and psychophysiological parameters, also parameters of EEG, ECG, EDA, eye movements, psychological tests, steroid hormone concentration.

Most of these Centre of Life Sciences laboratories are working as open access laboratories.

In the ProVaHealth project, Vilnius University has acted as a Living Lab, led group of activities 4.1 titled *Interviewing SMEs and analysing their needs for the purpose of the validation process* and contributed to all other activities in the project. To learn more about the Living Lab visit their website at: www.gmc.vu.lt/en/open-access-r-d-center

MATCH 12


SilvExpo

**Lublin Medicine Cluster
coordinated by The Municipality
of Lublin City**

The collaboration

The objective of the test conducted at Lublin Living Lab was to deliver a formulation of functional food products based on green needle provitamin paste.

Product or service for validation

SilvEXPO LTD. is the owner of green conifer needle extract provitamin paste. The provitamin paste has been used as the main ingredient for designing and manufacturing 3 functional food products. Products contain biologically active compounds: chlorophyll, polyphenols, vitamins, minerals, fatty and resin acids, phytosterols and carotenoids.

Products tested within the project went through a sensory examination with involvement of real users. End users selected for the analyses were people showing correct reactions in the recognition of four basic flavours (sweet, salty, sour and bitter). Extract from green conifer needles acts as a potent antioxidant, has anti-atherosclerotic action, as well as immunomodulatory properties. Therefore, adults potentially exposed to neurodegenerative and civilisation diseases are suggested as a target group of functional food products developed under the ProVaHealth project.

Services provided / work done

As a result of the collaboration three products (oil, candies and jellies) have been designed and produced in laboratory amounts. Products underwent sensory examination with involvement of real users. A report from the testing has been delivered to the SME. Lublin Living Lab has also delivered a report on registration procedures of functional food products in Poland as a support for a future commercialisation process on the Polish market.



The SME SilvExpo

Silv EXPO is a research and innovation company that develops new technologies in order to obtain natural substances from the nature. As the result, these extracts are incorporated into products, based on scientific and clinical data. The company has developed several innovative products for the treatment and prophylaxis of cardiovascular, respiratory, and chronic hepatic diseases.

Silv EXPO is working on spruce needle extracts with an aim to develop effective and natural products for improvement of the overall health. The substances within them can be used to improve our health and immunity.

Apart from that, Silv EXPO Ltd. are also working on nano-technological solutions for the inclusion of active substances into nanosomes to yield products in more bioavailable and effective pharmaceutical forms.

To learn more about the SME visit their website at: www.silvexpo.lv



The Living Lab Lublin Medicine Cluster coordinated by The Municipality of Lublin City

Health and medicine is among the main smart specialisations of the Lublin Province. As a result, about 150 members among public administration, universities, research centres, public hospitals, healthcare providers, technology companies, IFCs and advisory companies has created the Lublin Medicine Cluster. The cluster is managed by The Municipality of Lublin City and The Medical University of Lublin.

Lublin Living Lab activities are focused on functional food and dietary supplements development, diagnostics, telemedicine and robotics, oncology, cardiology, rehabilitation, health tourism, primary care, social and organisational innovations.

The cluster offer services such as services of laboratories, products/services development, prototyping, product/services evaluation and testing with involvement of end users, short series production, contract manufacturing, consulting (marketing, financing, business models), incubation and acceleration programmes, preclinical and clinical trials. This is typically done by drawing on public and private hospitals, medical centres, physicians, nursery homes, Third Age Universities and patient organisations who assist in innovation and end users involvement in the testing process.

Lublin Medicine Cluster is currently supporting innovation development within two internal projects:

Innotest — the purpose of the project is to create opportunity for SMEs including start-ups to validate, develop and test their innovative products and services in Cluster environment with involvement of experts, practitioners and end users.

InnoDesign — is developed to involve different groups of stakeholders including end users as a lead group in designing of innovative solutions based on defined end users' needs.

Lublin Medicine Cluster ecosystem is strongly supported by other clusters from Lublin Province including Lublin ICT Upland.

In the ProVaHealth project, The Municipality of Lublin City has acted as a Living Lab, led work package 4 titled *Validation of BSR Living Lab services for SMEs in health and well-being* and contributed to all other activities in the project. To learn more about Lublin Medicine Cluster visit their website at: www.medycyna.lublin.eu

MATCH 13

COMPACTA AB

SME

LIVING
LAB

Upper Silesian Agency for Entrepreneurship and Development Ltd. (GAPR)

The collaboration

The purpose of Polish-Swedish cooperation was to assess the effectiveness of the product intended to surgical site infection prevention. One of the more important factors causing surgical site infections is the airborne particles that carry bacteria. This is especially dangerous considering the growing problem of bacterial drug resistance. Technological solutions that minimize the risk of infection are desirable on the market.

Product or service for validation

The CompactaSteril® is a device designed and developed by the company Compacta AB from Sweden, intended to ensure that ultra-clean air is maintained in the operating field. According to the assumption, the examined device should significantly reduce the risk of contamination of the treatment and operational field. CompactaSteril® is optimized for minor surgical procedures such as hand, wrist, foot, and ankle surgery, minor trauma and fracture surgery, ophthalmic, dermatologic, and laparoscopic surgery, as well as treatment of infection prone wounds. The flexibility and function of CompactaSteril® allows for treatment in e.g. general practitioners' office, emergency and operating rooms, dermatology, rheumatology clinics, and for keeping surgical instruments sterile in operating rooms.

Services provided / work done

The testing process has been conducted on a small animal's model under simulated conditions in the treatment room. For the study the rabbits, New Zealand race were used. The study group was homogeneous in terms of age, weight and sex. Before starting the experiment, the rabbits were properly prepared: the hair has been shaved in place of a potential operating field, completely devoid of fur, and then the skin was washed and disinfected. Be-

fore the surgery, the animal was covered with sterile undercoats, and a special foil was applied to the skin. The procedure during the treatment was consistent with the one provided by Compacta AB representative. The experiment consisted of simulating surgical procedure with minimally invasive access from thoracotomy. The adopted research model proved to be adequate, and the conducted tests indicate that the use of the CompactaSteril® device can significantly reduce the risk of contamination of the treatment area.

The SME

ComPacta AB

Compacta AB — An innovation company with a medical technology field. The company was started in 2013 by Lars Wesén in Lund, Sweden.

To learn more about the SME visit their website at: www.compactasteril.com/om-compacta

The Living Lab

Upper Silesian Agency for Entrepreneurship and Development Ltd. (GAPR)

Upper Silesian Agency for Entrepreneurship and Promotion (GAPR) in Gliwice is a company with the City of Gliwice as the main shareholder, whose task is especially to support micro, small and medium-sized enterprises. For 15 years, the Agency is has intensively been working for the benefit of science, business and local government.

Professor Zbigniew Religa Foundation of Cardiac Surgery Development

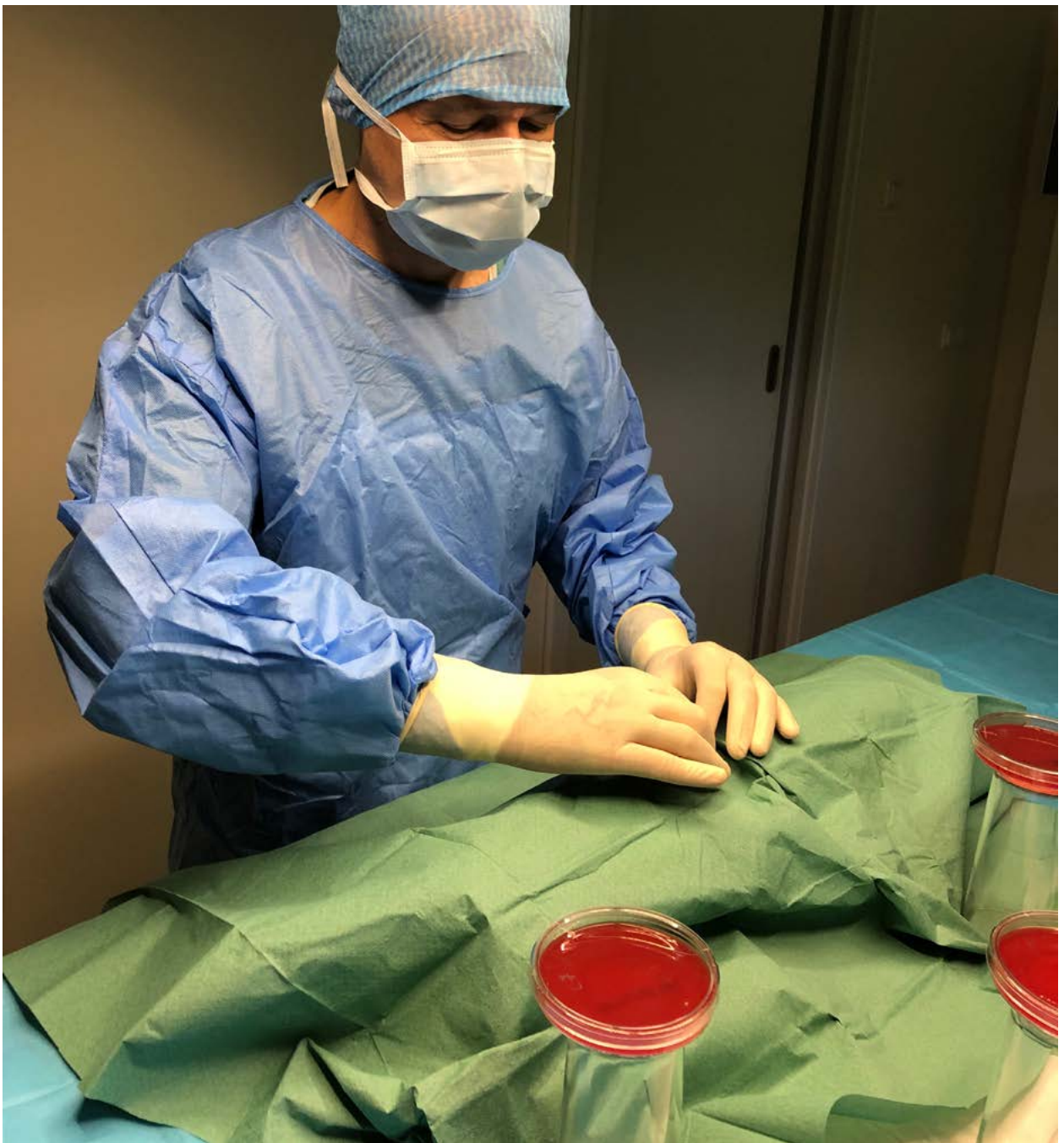
The goal of the Foundation for the Development of Cardiac Surgery in Zabrze, founded in 1991 by prof. Zbigniew Religa, is the introduction to clinical practice of modern techniques and technologies in the treatment of an endangered heart. The Foundation conducts scientific research

and implementation works related to the Polish artificial heart, biological heart valve prostheses, a surgical robot and innovative surgery tools as well as tissue engineering used for therapeutic purposes. Co-finances scientific and didactic publications. Organizes specialized workshops, conferences and symposia. It promotes an active, healthy lifestyle as the best prevention of heart disease. It is a modern scientific and research center for the Polish cardiac surgery and a center for the exchange of thoughts and experiences. Selected from many others, main specialized activities are the following

- Medical devices designing and development
- Electronic signal processing and measurement techniques applying
- Design and development of specialized, based on customer requirements equipment for tissue and organs culture in close to physiological conditions

- Modeling methods adapting for various expert systems adapting
- Supervising, coordinating and conducting pre-clinical and clinical trials of medical devices and products in accordance with the relevant standards and legal requirements
- Design, manufacture of prototypes, in vitro & in vivo testing of surgical robots and mechatronic surgical instruments

In the ProVaHealth project, The Upper Silesian Agency for Entrepreneurship and Development Ltd. (GAPR) has acted as a Living Lab, led group of activities 2.3 titled *Providing policy recommendations* and contributed to all other activities in the project. To learn more about the Living Lab visit their website at: www.gapr.pl; www.frk.pl



MATCH 14



The collaboration

The objective of the test was to test the needs and usability of MyPlan in the Swedish public health care.

Product or service for validation

MyPlan is a self-help tool for the management and prevention of personal crises, it is built on evidence-based research within the area of suicide prevention. Users enter their personal signs of a looming crisis, a list of their own coping strategies, and details of their friends and family members to contact if needed. The app has different features such as a map showing directions to the nearest psychiatric emergency department and direct links to suicide prevention hotline.

Services provided / work done

To understand the Swedish market and the healthcare system and structure regarding suicide prevention, an interview with the suicide prevention coordinator within Region Skåne was arranged. The role and responsibilities of the coordinator within Region Skåne and the action plans for the coming years on national as well as regional level were discussed and documented.

In order to get an understanding of Swedish viewpoints from clinicians' point of view about MinPlan as a possible solution in the regional healthcare area usability workshop with researchers and healthcare personnel from primary care and specialist care were conducted assessing the solution (English version) from a; strengths, weaknesses, opportunities and threats perspective in a regional healthcare context.

The SME MyPlan

In many parts of the world, there is limited access to psychiatrist and psychological help. Even in developed countries, there is a lack of psychiatric staff in the outpatient center and local communities. It is the vision of MyPlan to use intelligent digital technology to help people take care of themselves and look after each other and thereby prevent suicide worldwide and dissolve taboos and stigmatization of mental illness.

MyPlan builds on a deep understanding of the mental processes that can lead people to consider taking their own lives. It is developed in close cooperation with suicidal people, their peers, and highly profiled researchers and clinical staff in Australia and Denmark. Local version reflects how people are connected to each other and to their societal, social and cultural context in which MyPlan is adapted.

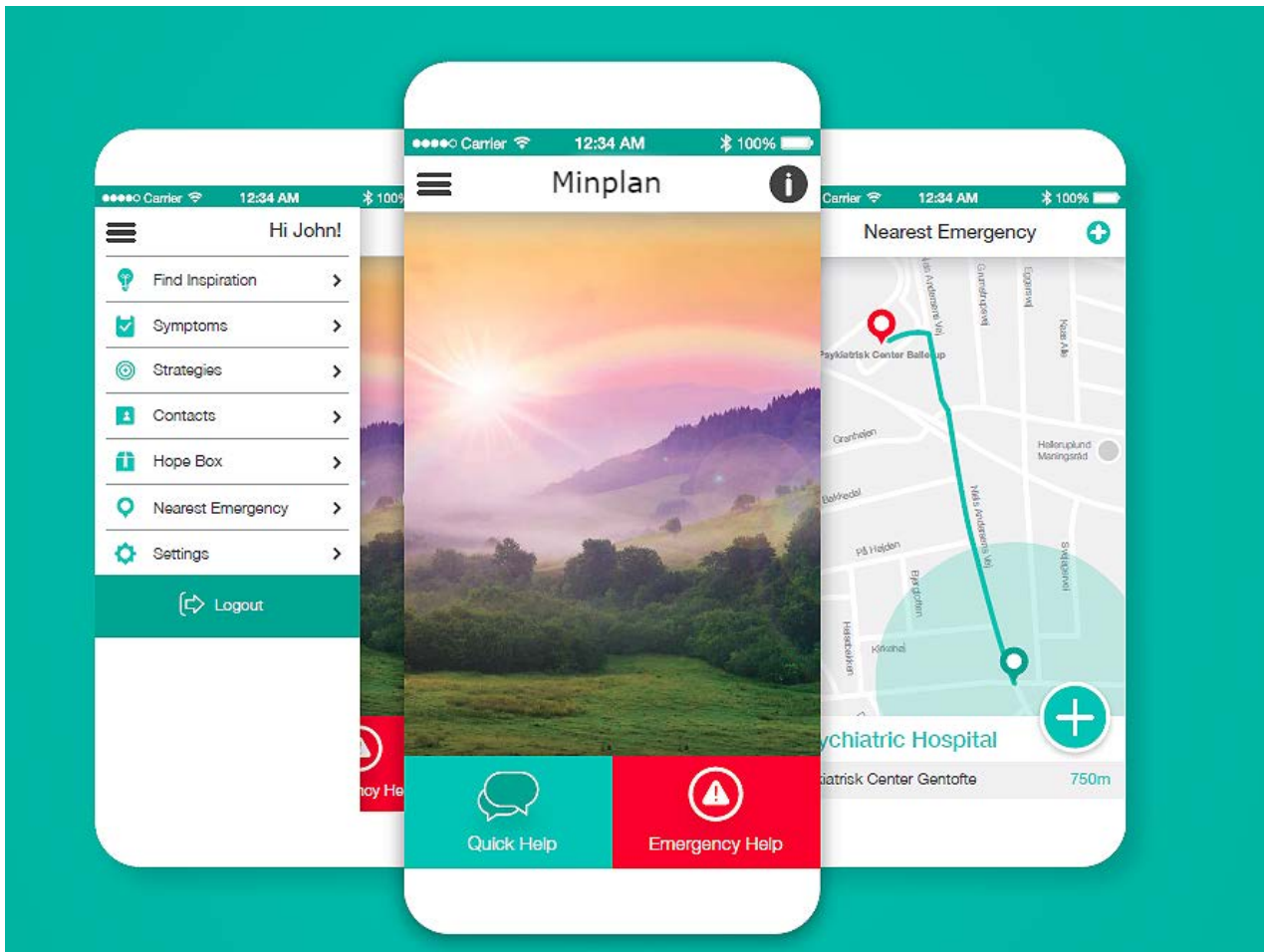
MyPlan apply a flexible business model that reflect variations in healthcare systems globally, and contribute to global sustainability by supporting mental health, personal development, resilience, and local job creation.

MyPlan is a cloud-based app with artificial intelligence to monitor and guide the users.

To learn more about the SME visit their website at: www.minplan.org

The Living Lab Innovation Skåne AB

Innovation Skåne is an Innovation company fully owned by Region Skåne, the County Council of the southernmost county in Sweden, a county with approximately 1.4 million inhabitants. Region Skåne is responsible for the region's public healthcare system and regional economic development, including e.g. innovation and growth, regional infrastructure, digitalisation, culture and public transportation.



Innovation Skåne's goal is to contribute to the future welfare services and regional growth through innovation. We offer innovation management expertise and support to Region Skåne and its employees, run growth projects in industries where Skåne has strong capabilities and there is international growth potential, and provide entrepreneurs and startups in Skåne with business advice. Innovation Skåne focus all efforts on five areas where Skåne has particularly strong potential to make an impact in Sweden as well as globally: Health, Mobility, Materials, Lighting and Foodtech.

Innovation Skåne has a long successful track record of working with startups, entrepreneurs, initiation and management of projects for the development of new methods for growth, and industry collaborations in our various industries. Innovation Skåne works with Region Skåne's healthcare services to create value for patients and employees through innovation. These include change management and how new innovative technologies can be used in healthcare, and the introduction of digital solutions, in order to improve Region Skåne's ability to innovate or improve its capacity to scale and/or stimulate for new innovations. This is done through work with guidelines for handling personal data, procurement strategies and innovation procurement as well as innovation methodologies, such as need and impact analysis, service design, policy labs and system transformation, as well

as testbed and Living Lab. Innovation Skåne also works with Skåne's municipalities and their need for innovation.

In our testbed and Living Lab we offer testing access and valuable contacts and insights through extensive inputs in healthcare and care players and to various professionals in Region Skåne, in Skåne's municipalities and in private healthcare and care companies.

As part of the Skåne ecosystem we have amongst others access to

1. Collaboration with innovation and digitization projects in Region Skåne, led by healthcare professionals employed by Innovation Skåne
2. Network with national and international contacts and skills from researchers and companies of great importance for the digital transition of health, healthcare, care and entrepreneurship and start-up activities.
3. Contacts in other local areas of strength such as the mobile industry, research in diabetes, cancer diagnostics, smart materials, foodtech, lighting and mobility.

In the ProVaHealth project, Innovation Skåne AB has acted as a Living Lab, took over leadership of group of activities 3.2 titled *Transnational Living Lab training programme and concept development* and contributed to all other activities in the project. To learn more about the Living Lab visit the website: www.innovationskane.com

OTHER PARTNERS

ScanBalt

ScanBalt® fmba is Northern Europe's Leading Accelerator for Inter-regional Cooperation envisioning the region as a Global Hotspot for Health and Bio Economy. ScanBalt Business Club facilitates business development and market access. It reaches out to 3000 companies, 50 university hospitals, 60 universities within health/life science, 50 health care clusters and networks and 75 health care sector science parks.

In the ProVaHealth project, ScanBalt has acted as communications partner and contributed to all other activities in the project. To learn more about the partner visit their website at: www.scanbalt.org

Tallinn Science Park Tehnopol

Tallinn Science Park Tehnopol is a research and business campus with a mission of helping startups and SMEs to grow more quickly. As the largest science park in the Baltics, we provide enterprises with both modern office spaces and top-notch counselling in developing their business and entering export markets.

Tehnopol Startup Incubator helps technology-based startups to develop their business and get investments, using the best mentors from Estonia and Europe. Tehnopol Startup Incubator helps startups to get going with an efficient mentoring programme, relevant training and a convenient co-working hub. Our main focus areas are ICT, green and health technologies.

Our smart research campus is forming one big campus area with Tallinn University of Technology. In the campus we have well-regarded technology companies such as Skype, Cybernetica, Starship Technologies, Ektaco, and SMIT. More than 200 innovative technology-based companies have found a new home here.

We manage the Connected Health Cluster and invite you to join Estonia's largest health technology community, which brings together providers of health services, health technology companies, treatment facilities and all other important interest groups connected with this field.

In the ProVaHealth project, Tallinn Science Park Tehnopol has acted as lead partner for the project, led work package 3 titled *Good management practices transfer* and contributed to all other activities in the project. To learn more about the lead partner visit their website at: www.tehnopol.ee/en

Tallinn University

Tallinn University (TLU) is a public institution of higher education and research. It is the largest humanities university in Tallinn and the third largest public university in Estonia.

The QS World University and Times Higher Education rankings place Tallinn University among the top 1000 best universities in the world. Correspondingly, based on the World Higher Education Database, TLU belongs to the world's top 5% of the best universities.

Tallinn University is part of the innovation ecosystem representing all aspects of the public-private-peoples-partnership. The mission of TLU is to support the sustainable development of Estonia by using the resources of the university's R&D activities to define acute problems and to present effective solutions. Wishing to contribute more to the society, TLU has set a goal to promote intelligent lifestyles in Estonia. TLU has a special focus on a wellbeing living lab.

TLU has over 400 talented and motivated researchers and lectures on staff, and more than 7,500 students (9.5% of them international). Both, academics and students may perform as a test-bed or end-users.

The University's different departments make use of high-end technology. TLU has a special development unit for cooperation with both well-established and start-up companies, a cooperation contract with the City of Tallinn, the capital of Estonia, and independent cooperation contracts and real-life working ties with more than 50 acknowledged universities around the world as well as international innovation-focused networks and living labs.

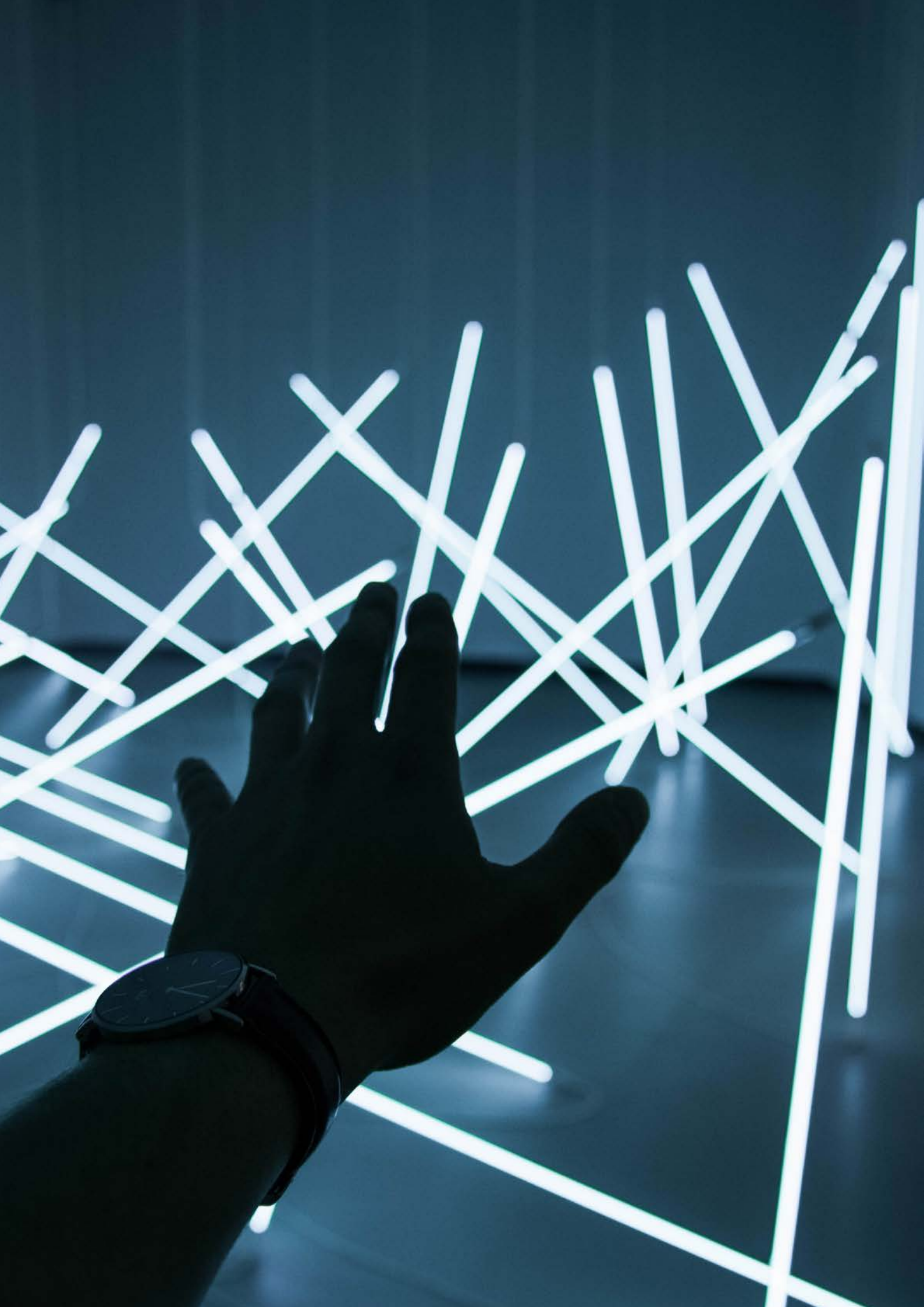
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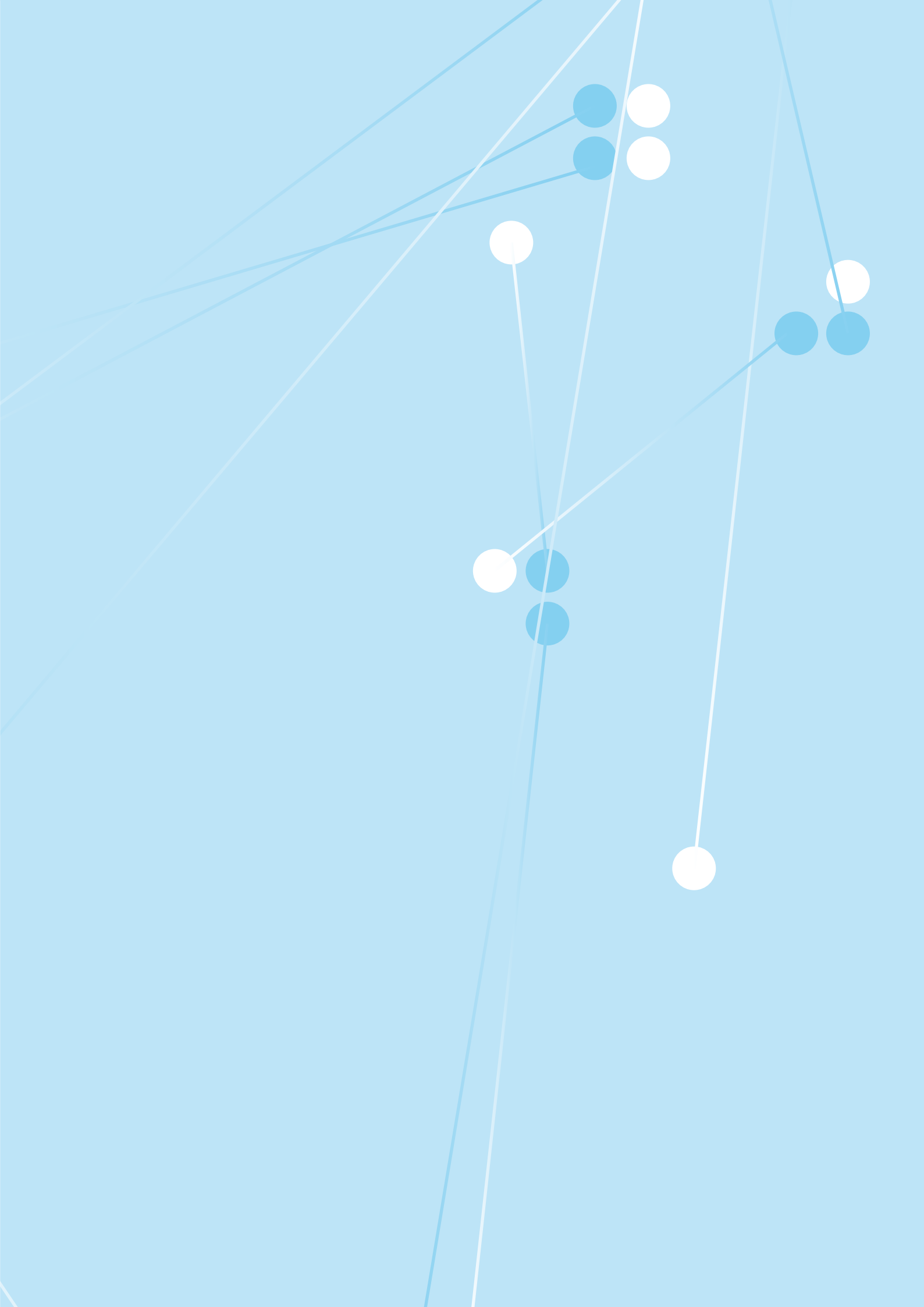
- development of ideas and services
- validation of solutions with all stakeholders
- testing in a live customer environment
- feedback and insight into your solution or service from industry experts
- networking with local researchers, entrepreneurs, end-users, public sector stakeholders and other international living labs
- research, consultation, R&D, trainings.
- You can use different state grants with us.

In the ProVaHealth project, Tallinn University has led work package 2 titled *Living Lab analysis, development tools and monitoring* and contributed to all other activities in the project. To learn more about the partner visit their website at: exu.tlu.ee or contact Katri-Liis Lepik, klleplik@tlu.ee.











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